Volume 1 of 4

Feasibility Report - Proposed Eastern Expansion (WDNR License No. 3268)

Vernon County Landfill

Viroqua, Wisconsin

VERSW 167824 | September 11, 2023

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September 11, 2023

RE: Vernon County Landfill
Feasibility Report - Proposed Eastern Expansion (WDNR License No. 3268)
Viroqua, Wisconsin
SEH No. VERSW 167824 4.00

Mr. Mark Peters, Hydrogeologist
Wisconsin Department of Natural Resources
1027 W. St. Paul Ave.
Milwaukee, WI 53233

Dear Mr. Peters:

Short Elliott Hendrickson Inc. (SEH®), on behalf of the Vernon County Solid Waste Department, is submitting this Feasibility Report (FR) to obtain the Wisconsin Department of Natural Resources (WDNR) opinion regarding the suitability of the proposed landfill expansion. The Vernon County Landfill (WDNR License No. 3268) proposes an expansion of the existing landfill to continue to provide solid waste disposal services. The proposed expansion will be a contiguous horizontal and vertical expansion directly east of the existing landfill.

This FR was prepared in accordance with s. NR 512 Wisconsin Administrative Code. The enclosed report includes text, tables, and figures, along with appendices labeled A through U and Drawings numbered No. 1 through No. 35. The report information follows the general order and provides information required in the Feasibility Report Completeness Checklist Chapter NR 512, Wis. Adm. Code and addresses requirements presented in the Design and Construction Criteria Completeness Checklist Chapter NR 504, Wis. Adm. Code. Both checklists are included complete with location references.

Should you have any questions or would like to discuss the proposed expansion further, please contact me at 608.498.4844.

Sincerely,



Brian L. Kent, CHMM
Project Manager

dmk
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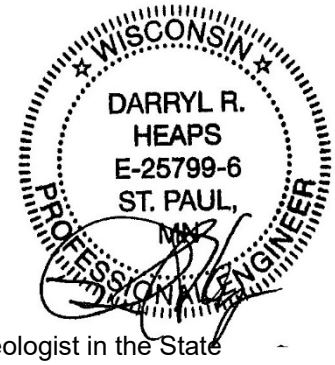
Feasibility Report - Proposed Eastern Expansion (WDNR License No. 3268)

Vernon County Landfill
Viroqua, Wisconsin

Prepared for:
Vernon County
Viroqua, Wisconsin

Prepared by:
Short Elliott Hendrickson Inc.
329 Jay Street, Suite 301
La Crosse, WI 54601-4034
608.782.3161

I, Darryl R. Heaps, hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.



E-25799 September 11, 2023
Darryl R. Heaps, PE, CHMM PE Number Date
Professional Engineer

I, Melanie G. Niday, hereby certify that I am a licensed professional geologist in the State of Wisconsin in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code; that the preparation of this document has not involved any unprofessional conduct as detailed in ch. GHSS 5, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.



672-013 September 11, 2023
Melanie G. Niday, PG PG Number Date
Hydrogeologist

SEH

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Feasibility Report - Proposed Eastern Expansion (WDNR License No. 3268)

Vernon County Landfill

Prepared for Vernon County, Wisconsin

1 Introduction

1.1 Purpose and Scope

The Vernon County Solid Waste Department (Vernon County) proposes a vertical and horizontal expansion (referred to hereinafter as “Eastern Expansion” or “Expansion”) of the existing municipal solid waste (MSW) landfill (WDNR License No. 3268). Short Elliott Hendrickson Inc. (SEH®), on behalf of Vernon County, is issuing this Feasibility Report (FR) to provide the information required in NR 512 Wisconsin Administrative Code (Wis. Adm. Code) to demonstrate the feasibility of the proposed Expansion. Specifically, this report has been prepared in accordance with the requirements of NR 500.05, NR 504, and NR 512 Wis. Adm. Code to enable the Wisconsin Department of Natural Resources (WDNR) to provide an opinion on the potential for the Eastern Expansion. A copy of the WDNR’s NR 512 Feasibility Completeness Checklist and the NR 504 Design and Construction Criteria Completeness Checklist are provided in **Appendix A**.

The proposed Eastern Expansion includes a contiguous horizontal and vertical expansion of approximately 9-acres over and east of the existing MSW landfill (WDNR License No. 3268). The contiguous design promotes a minimized landfill footprint. The horizontal component consists of an approximate 4.0-acre horizontal expansion due east and contiguous to Phases IV through VI. The vertical component will extend the existing landfill vertically over an approximate 5.0-acre area of the existing footprint. The Expansion will overlay its waste onto existing Phases IV through VI.

The proposed Expansion results in an increase of 427,355 cubic yards (CY) of air space capacity. This FR presents locational, geologic, and hydrogeologic data collected during site investigations and existing available information. The site investigations also informed the design concepts, which are consistent with the currently permitted MSW Landfill. Supporting data included with this FR are presented as tables, maps, and illustrations within the report and attachments. A plan set including **Plan Sheets 1 through 35** are attached separately. Applicable correspondence, raw data, supporting calculations and miscellaneous information are presented in **Appendices A** through **U**.

1.2 History and Background

Vernon County owns and operates an integrated waste management system on approximately 250-acres located in the Town of Viroqua, Wisconsin. The current landfill, and proposed

Expansion, is located in portions of the Southwest and Southeast ¼ of Section 15, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin. The integrated waste management system includes, but is not limited to:

- An approximate 10-acre MSW landfill, with an approximate design capacity of 590,000 CY (WDNR License No. 3268).
- A closed small sized (50,000 CY) C&D Landfill (WDNR License No. 3712).
- A recyclable material processing and baling facility.

The Vernon County Landfill was originally designed and permitted in early 1992 with three horizontal phases consisting of a design capacity of 315,000 CY. A vertical expansion was approved in 2005, which included three additional vertical sequences and added 275,000 CY of airspace. The landfill formerly operated as a balefill since it was initially opened in 1993 but was later modified to an area fill operation via a July 2016 Plan Modification.

Vernon County issued an Initial Site Inspection (ISI) request (SEH, November 2020) on November 4, 2020. The WDNR conducted an ISI for the proposed Expansion on November 18, 2020. A revised ISI request dated September 3, 2021 was submitted to the WDNR for consideration of additional area to the north and east of the existing landfill for potential landfill expansion. The WDNR conducted a site inspection of the additional areas on September 30, 2021. In letters dated December 15, 2020 and November 1, 2021, the WDNR indicated the site has potential to be suitable for an expansion. Vernon County submitted an Initial Site Report (ISR) dated November 17, 2021 to the WDNR for the proposed Expansion (SEH, November 2021). The WDNR ISR response, dated February 15, 2022 indicated the proposed expansion has potential for development of a solid waste disposal facility. WDNR comments provided in the ISR are addressed in Section 1.4 below. The WDNR ISI and ISR response letters are provided in **Appendix B**.

Additional historic correspondence and approvals pertinent to the MSW Landfill and this Expansion include:

- Vernon County Sanitary Landfill Feasibility Report (Central Wisconsin Engineers, Inc., October 1990)
- Initial Site Report (ISR) and Feasibility Report Completeness Letters (WDNR, February 6, 1991)
- Feasibility Determination for the Proposed Vernon County Sanitary Landfill (GW Monitoring ID No. 03268) (WDNR, February 26, 1992)
- Addendum to the Vernon County Sanitary Landfill Feasibility Report (Central Wisconsin Engineers, Inc., July 19, 1991)
- Vernon County Sanitary Landfill – Plan of Operation (Central Wisconsin Engineers, Inc., February 1992)
- Conditional Plan of Operation Approval – the Proposed Vernon County Balefill (July 20, 1992)
- Informal Plan Approval of Used Oil Collection Program, Vernon County (March 1, 1994)
- Plan of Operation Approval Modification for leachate Collection Pipe Layout – Module 2 of Phase 1, Vernon County Balefill (WDNR, October 11, 1995)
- Plan of Operation Approval Modification: Increase Phase Size & Eliminate Lysimeter – Modules 1 & 2 of Phase 2, Vernon County Balefill (WDNR March 20, 1997)

- Plan Modification Approval for Phasing Changes at Vernon County Balefill (WDNR, October 16, 2000)
- March 7, 2002 Expedited Plan Modification, Vernon County Sanitary Balefill, License #3268 (WDNR, March 12, 2002)
- Initial Site Inspection – Proposed Vertical Expansion of the Vernon County Landfill (WDNR, June 27, 2002)
- Initial Site Report (ISR) Completeness Determination for the Proposed Vertical Expansion at the Vernon County Landfill, (License No. 3268, Viroqua, WI (WDNR, August 23, 2002)
- Feasibility Report for the Proposed Vertical Expansion of the Vernon County Balefill (Central Wisconsin Engineers & Architects, Inc., August 2003)
- Conditional Plan of Operation for the Proposed Vertical Expansion of the Vernon County Balefill (Landfill) (WDNR, July 29, 2005)
- Conditional Plan Modification to the Plan of Operation Approval for the Expanded On Site Soil Borrow Source, Vernon County Balefill, License #3268, Vernon County, Wisconsin (WDNR, May 18, 2011)
- Conditional Plan Modification to the Plan of Operation Approval for Leachate Biotreatment, Vernon County Sanitary Balefill, License 3268, Town of Viroqua, Vernon County, Wisconsin (August 1, 2013)
- Conditional Plan Modification to the Plan of Operation Approval for the Vernon County Sanitary Balefill, License 3268, Town of Viroqua, Vernon County, Wisconsin. (WDNR, July 1, 2015)
- Conditional Plan Modification to the Plan of Operation Approval for the Vernon County Sanitary Balefill, License 3268, Town of Viroqua, Vernon County, Wisconsin (WDNR, October 10, 2016)
- Initial Site Inspection Request Vernon County Landfill, Viroqua Wisconsin, WDNR License No. 3268 (SEH, November 4, 2020)
- Initial Site Inspection Response - Proposed Expansion to Vernon County Landfill, License #3268 (WDNR, December 15, 2020)
- Conditional Plan of Operation Approval Modification for the Vernon County Sanitary Balefill Landfill, Town of Viroqua, Vernon County, License No. 3268 (WDNR, February 9, 2021)
- Revised Initial Site Inspection Request Vernon County Landfill, Viroqua Wisconsin, WDNR License No. 3268 (SEH, September 3, 2021)
- Supplemental Initial Site Inspection Opinion Letter – Proposed Expansion to Vernon County Landfill, License #3268 (WDNR, November 1, 2021)
- Initial Site Report Proposed Vertical and Horizontal Expansion Vernon County Landfill, Viroqua, Wisconsin, WDNR License No. 3268 (SEH, November 17, 2021)
- Initial Site Report for the Proposed Vertical and Horizontal Expansion Vernon County Landfill, Viroqua, Wisconsin – License #3268 (WDNR, December 17, 2021)
- Initial Site Report Opinion Letter for the Proposed Vertical and Horizontal Expansion Vernon County Landfill, Viroqua, Wisconsin – License #3268 (WDNR, February 15, 2022)

- Alternate Geotechnical Program Request – Proposed Landfill Expansion WDNR License No. 3268 (SEH, December 13, 2021)
- Conditional Plan of Operation Approval Modification for the Organic Stability Plan and Leachate Recirculation Plan for the Vernon County Landfill, Vernon County, Wisconsin, License #3268 (WDNR, October 11, 2022)
- Acceptance of Proposed Alternative Geotechnical Investigation Program for Feasibility Study, Vernon County Landfill, Vernon County, Wisconsin – License #3268 (WDNR, March 30, 2022)
- Response to AGIP Acceptance Letter – Proposed Landfill Expansion WDNR License No. 3268 (SEH, July 27, 2022)

1.3 Exemption Requests {NR 512.05}

The following exemptions to NR 500 and NR 140 Wis. Adm. Code are requested for the proposed Expansion. A listing and explanation of each exemption request is provided including references to the appropriate sections of this report and provides additional support and justification for each exemption request.

1.3.1 New Exemption Requests

Alternate Geotechnical Investigation Program (AGIP)

The following are exemptions requested as part of the Alternate Geotechnical Investigation Program (AGIP) for the proposed Eastern Expansion that was submitted to the WDNR on December 13, 2021 (**Appendix I**) and accepted by the WDNR on March 30, 2022 (**Appendix B**). A Response to AGIP Acceptance Letter was also submitted to the WDNR on July 27, 2022 (**Appendix I**):

NR 507.05(2) - Attempts to core bedrock have been unsuccessful due to weathering, existing fractures, and layered heterogeneity of dolomite, dolomitic sandstone, and siltstone, Vernon County is requesting an exemption to NR 507.05(2) Wis. Adm. Code and propose that coring of bedrock be attempted at only one drilling location (MW-14WT). In lieu of bedrock coring, downhole geophysical logging will be used to evaluate bedrock.

NR 512.09 - Vernon County Landfill is requesting an exemption to use previously collected data to meet requirements of s. NR 512.09, Wis. Adm. Code. Use of this data would include, but not be limited to, the following: Field hydraulic conductivity tests completed on the existing wells, including those wells which have been abandoned; Grain size analysis, Atterberg limits, soil classification, and laboratory hydraulic conductivity from past investigations; Soil boring logs from past investigations which are not totally compliant with the present NR 507.05 Wis. Adm. Code, but provide useful and accurate data; Existing groundwater quality data as background data.

NR 512.11(2) – NR 512.11(2) Wis. Adm. Code requires that geological cross-sections be constructed through all borings. Since we have a considerable amount of boring and monitoring well data for the facility, we request an exemption to the requirement and propose to construct cross-sections only through the borings and wells that assist in defining the lateral and vertical extent of the major lithostratigraphic units, this will include all borings that characterize the subsurface within 300 feet of the expansion.

NR 507.14 and NR 140.23 - Sections NR 507.14 and NR 140.23, Wis. Adm. Code, require that soil boring information be presented on department forms and include the information listed in s.

NR 507.14(2), (3) and (4), Wis. Adm. Code. Some historic data from the files for the year 1987 are not available; however, some historical soil boring descriptions are presented on geological figures in historical files. Although sufficient information is provided from available and proposed soil boring logs, Vernon County is requesting an exemption for the use of all historical logs during final presentation in the feasibility report, if appropriate, to assist in the overall site interpretation.

NR 507.05(1)(e) - An exemption to NR 507.05(1)(e) Wis. Adm. Code is being requested for the requirement to retain soil samples until the department approves the report that included documentation of the soil samples. The soil samples from the existing historic borings utilized for the AGIP have not been retained. The borings were completed during previous permitting processes or investigations and approved by WDNR.

Baseline Sampling of New Groundwater Monitoring Wells

NR 140.10, NR 140.12, and NR 140.28 - An exemption is requested from NR 140 Wis Adm. Code groundwater quality standards based on the results of the first six rounds of baseline groundwater sampling at five recently installed monitoring wells. Details of the baseline groundwater sampling results are included in Section 5.4.3.2, and a summary of the exemption requests are provided on **Table 5-8**. Specifically, exemptions are requested for the following wells and parameters.

- An exemption in accordance with NR 140.28(3)(a) is requested for arsenic at MW-14WT.
- An exemption in accordance with NR 140.28(4)(a) is requested for manganese at MW-14WT.

Existing Groundwater Monitoring Wells within 300-feet of Proposed Expansion

NR 140.10, NR 140.12, and NR 140.28 - An exemption is requested from NR 140 Wis Adm. Code groundwater quality standards based on the results of semi-annual detection groundwater sampling an existing monitoring well installed during past investigations and utilized for the detection groundwater monitoring program. Details of the detection groundwater sampling results are included in Section 5.4.3.2, and a summary of the exemption requests are provided on **Table 5-8.** Specifically, exemptions are requested for the following well and parameter.

- An exemption in accordance with NR 140.28(3)(a) is requested for nitrate plus nitrite, as nitrogen (N+N) at MW-6.

5% Overfill

NR 504.09(2)(h) - An exemption is being requested to temporarily allow final outboard fill slopes to exceed 4 horizontal to 1 vertical slopes. The proposed modification is to allow maximum intermediate waste filling grades that are slightly higher than the approved final waste grades in areas of the landfill that have not received final cover. We are requesting approval for the maximum intermediate waste grades to be 5 percent higher than the final waste grades when compared to the total depth of waste at a given location. At no time during the operating life of the landfill will the waste volume exceed the permitted capacity. This modification does not change the final waste grades, the permitted capacity, or the closure sequencing for the landfill. Geotechnical slope stability analysis will account for 5% overfill grades and will be completed in the Plan of Operation.

NR 504.06(3)(h) – An exemption is being requested decrease the length of clay liner tie in between the proposed Expansion and existing clay liner. NR 504.06(3)(h) Wis. Admin. Code requires that the clay component of a liner in adjacent phases shall be keyed together using a

minimum of 4 steps, with the total width of the spliced area measuring a minimum of 15 feet. We are requesting that the clay tie in be performed with 4 steps over a 5-foot distance to minimize disruption to in place waste and composite clay and geomembrane base liner as shown on **Detail 7** on **Plan Sheet 30**.

1.3.2 Previous Granted Exemptions

In the Feasibility Determination for the previous vertical expansion dated June 28, 2004, the WDNR granted the following exemptions for the MSW landfill. These exemptions were addressed and incorporated in the Plan of Operation for MSW landfill and are requested to be continued for the proposed expansion, unless otherwise noted.

Exemptions for Proximity to Private Water Supply Well NR 504.04

NR 504.04 (3)(f) - An exemption to NR 504.04 (3)(f) was granted within the Feasibility Determination for the previous vertical expansion dated June 28, 2004, to allow the expansion to occur within 1,200 feet of the existing private water-supply well that serves the balefill facility.

Exemptions to Water Quality Standards NR 140.10, NR 140.12

NR 140.10, NR 140.12, and NR 140.28 - Exemptions to the water quality standards specified in s. NR 140.10 and s. NR 140.12 Wis. Adm. Code were approved for the currently permitted landfill in the feasibility determination letter dated June 28, 2004. Additionally, alternative concentration limits (ACL) for several inorganic parameters were approved in WDNR Plan of Operation approval dated July 29, 2005. The following NR 140 groundwater standard exemptions are requested to be continued for the proposed Expansion. It is also requested that the ACLs outlined in the July 29, 2006, Plan of Operation approval be continued for the proposed Expansion. Refer to **Table 5-7** for a summary of the existing groundwater quality exemptions.

- Request continuation of NR 140.28(3)(a) exemption for iron at MW-1R.
- Request continuation of NR140.28(4)(a) exemption for iron at MW-1PR, MW-3, MW-5A, MW-7, MW-9, MW-12, and P-1.
- Request continuation of NR 140.28(3)(a) exemption for fluoride at MW-2, MW-2P, MW-3, MW-4P, MW-5A, MW-6, MW-8R, MW-11, and MW-12.
- Request continuation of NR 140.28(3)(a) exemption for manganese at MW-14.
- Request continuation of NR 140.28(3)(a) exemption for nitrate plus nitrite, as nitrogen (N+N) at MW-1RZ, MW-13P, and MW-14.
- Request continuation of NR 140.28(4)(a) exemption for nitrate plus nitrite, as nitrogen (N+N) at MW-14Z.

1.4 WDNR ISR Comments {NR 512.05}

In accordance with NR 512.05, the following addresses all review comments in the WDNR's ISR response letter. To assist in the WDNR's review, each comment identified in the letter has been listed in *italics*, and subsequently addressed in non-italicized text.

WDNR Comment: The uppermost bedrock unit at the site is fractured dolomite. Flow patterns through fractured bedrock generally are difficult to monitor and do not retard or facilitate attenuation of contaminants in groundwater. Fractured bedrock flow can act as a conduit to deeper aquifers that may be sources for water supply wells, in the event of groundwater impacts. The ISR states that it is anticipated that bedrock excavation may be necessary to achieve a 10-

foot separation between the bottom of the liner and the top of bedrock. The feasibility report should discuss what type of soil backfill and method of placement that would be used to achieve the 10-foot minimum separation. The geotechnical analysis should also discuss the suitability of this geological setting with respect to demonstrating compliance to the groundwater protection standard of s. NR 504.04 (4)(d), Wis. Adm. Code. This may include an evaluation of the bedrock fractures including their size, frequency, distribution, connectivity, hydraulic conductivity, observations from boring and well drilling, existing facility design and performance, and other aspects. Alternative designs and additional measures to protect groundwater should be considered and discussed. Examples of additional measure may include an additional layer to the liner, additional leachate extraction, larger diameter leachate collection pipes or other designs to provide additional protection to groundwater. The feasibility report should include a discussion of the proposal and any alternatives considered, using the information from the site-specific geotechnical investigation.

In addition, the ISR states the Cambrian sandstone aquifer would be the only aquifer available for use within the proposed landfill expansion area. However, cross-sections and logs from previous investigation conducted at the site indicate the existence of perched groundwater and water table aquifer conditions within the Ordovician dolomites of the Prairie du Chien Group beneath the site. The feasibility report should provide a more complete description of the groundwater conditions, aquifers, and hydrogeology at site, using existing and new information from the site-specific geotechnical investigation.

Response: After further site investigation, it has been determined that bedrock will not have to be excavated in order to achieve a 10-foot separation between the bottom of the liner and the top of bedrock. Further discussion regarding bedrock separation is presented in Section 8.5.1. Further evaluation of the suitability of the geological setting with respect to demonstrating compliance to the groundwater protection standard of s. NR 504.04 (4)(d), Wis. Adm. Code is presented in Section 5.4. The aquifer encountered on-site is the St. Peter-Prairie du Chien-Jordan aquifer. All monitoring wells and piezometers on-site are completed within bedrock of the Prairie du Chien Group. A comprehensive discussion of the groundwater conditions on-site is presented in Section 5.4.2.

Vernon County has historically implemented additional measures to protect groundwater through its composite liner design. The composite liner design of the existing landfill contains a 5-feet thick clay layer which exceeds the minimum 4-feet thick requirement of NR 504.06(2)(e). Vernon County intends to continue implementation of a 5-feet thick clay layer for the proposed Expansion. Further discussion of the liner design is provided in Section 8.7. Additionally, regulatory changes to liner design criteria in NR 504 will improve effectiveness of the liner system through requirements for higher permeability drainage blanket material (1 centimeter per second) coupled with a geotextile cushion to protect the underlying geomembrane. Electrical resistivity testing will continue to be performed to verify the geomembrane is not damaged during placement of the leachate collection blanket, or if damaged is appropriately prepared prior to waste placement. Vernon County also implements operational practices for added protection of the composite liner system through placement of a 10-foot “fluff” lift of initial waste in a newly constructed cell. The fluff lift consists of MSW that does not contain large items that could potentially pierce the liner. Waste compaction equipment is not allowed to operate until this initial fluff lift has been established.

WDNR Comment: The ISR indicates that the proposed expansion footprint is within 1,200 feet of one private water supply well – the well serving the landfill office and recycling center. Section

NR 504.04(3)(f), Wis. Adm. Code, requires a minimum distance of 1,200 feet to be maintained between the limits of filling and public or private water supply wells. If the well remains in service, the feasibility report will need to request an exemption from s. NR 504.04(3)(f), Wis. Adm. Code, for this water supply well. An exemption request needs to explain why the exemption is warranted, including supporting information showing how the well would be adequately protected from potential groundwater contamination. The supporting information should consider the factors that affect the ability to meet the groundwater protection standard which include the groundwater flow properties displayed in this site-specific bedrock, the distance to bedrock and groundwater, soil backfill characteristics and the proposed landfill design. Additional factors to consider include the groundwater flow directions, the construction of the water supply well and the ability to effectively monitor groundwater around the facility.

In addition, a variance from the locational setback requirement of s. NR 812.08 (4) (g) (1), Wis. Adm. Code, for each water supply well located within 1,200 feet of the proposed limits of waste, under the provisions of s. NR 812.43, Wis. Adm. Code would be needed; or may need to be updated if a variance was previously issued. The feasibility report should include a copy of any previously issued NR 812 well variances. If a previous variance exists, the department will determine if an updated variance is necessary and provide that information to Vernon County. A variance may need to be updated depending on circumstances such as changes in proximity of waste to the well, changes in waste location with respect to groundwater flow, changes to the well or other reasons.

Because the review times established in ch. NR 812, Wis. Adm. Code, are different than the review times established for the feasibility report, please coordinate submittal of any variance application needed with the department so that the department's decision on the variance is synchronized with the decision on landfill's feasibility determination. The department will inform Vernon County when to submit the NR 812 variance application. Typically, this is just before the public comment period.

Any NR 812 well variance applications should be submitted to Marty Nessman with the department's Drinking Water and Groundwater (DG) program. The NR 812 variance application form can be accessed at:

https://dnr.wi.gov/files/pdf/forms/3300/3300-209.pdf The department must receive both the well construction information for each well and a completed NR 812 well variance application before the department may issue an NR 504 exemption.

Response: The existing private well-supply well (P-1) that serves the balefill facility is located greater than 1,200 feet from the proposed Expansion area; therefore, an exemption is not needed.

WDNR Comment: As a reminder, in accordance with ss. 289.22 and 289.23, Wis. Stats., the applicant must notify all affected municipalities and apply for all specified local approvals at least 120 days before a feasibility report can be submitted to the department (the exact time period depends upon the municipal response). The Waste Facility Siting Board has specific requirements which apply to the municipal notification. For additional information on these requirements, please contact the Wisconsin Waste Facility Siting Board at (608) 267-7854. The feasibility report must contain documentation showing that all proper notifications and applications for all specified local approvals have been made, in accordance with s. NR 512.06, Wis. Adm. Code.

Response: Local notifications with certified mail confirmations can be found in **Appendix C**. Notifications are dated June 1, 2022, postmarked June 15, 2022, and were delivered June 17, 2022 or June 27, 2022.

2 Procedural Requirements {NR 512.06, NR 512.19 and Wis Stats. 289.24(1)(d)}

2.1 Local Approvals {NR 512.06(1)}

Affected municipalities, as defined under s. 289.01 (1) of Wisconsin Statues, surrounding the proposed Expansion include the Town of Viroqua and Vernon County (the applicant). The Vernon County Solid Waste and Recycling Department notified the affected municipalities regarding the proposed landfill Expansion by letter dated June 1, 2022. Copies of each notification letter sent to the affected municipalities along with the signed return receipts for certified mail are provided in **Appendix C**. The Waste Facility Siting Board (WFSB) was formally notified on June 1, 2022. Due to issues with the WFSB not receiving certified mail receipts until March 17, 2023, an extension was given to the affected municipalities.

The Town of Viroqua passed a siting resolution on March 16, 2023 indicating their intent to participate in negotiations with Vernon County regarding the proposed Expansion. Vernon County is the applicant, therefore, is not considered an “affected municipality” for the purposes of negotiation. A siting agreement is currently being negotiated between the affected parties.

2.2 Submission of Reports {NR 512.06(2)}

As part of the landfill siting process, Vernon County is required to submit a FR in accordance with NR 512.05. As required by NR 512.06(2) and applicable requirements of Wis State Statutes, the appropriate number of copies and plans as well as the ISR were sent to WDNR and affected municipalities. Certified mail receipts and documentation of the transmittal to the local affected municipalities and local library will be sent to WDNR when they become available.

2.3 County Solid Waste Management Plans {Wis Stats. 289.24(1)(c)}

According to state statute 289.10, "each county board in Wisconsin individually or jointly with another county board may prepare and adopt a county solid waste management plan.” The Vernon County Landfill accepts wastes primarily from within Vernon County.

Based on information presented in the 2003 FR, Vernon County’s original solid waste management plan was completed in 1986 but was revised in March of 2002. These documents were reviewed in the process of conducting this feasibility study to ensure that the proposed landfill Expansion is consistent with existing solid waste management plans.

Vernon County’s 1986 Solid Waste Management Plan recommended the construction and operation of a countywide sanitary landfill in conjunction with source reduction efforts. Acting on this recommendation, Vernon County opened its sanitary balefill in 1993, with the waste collection and transportation services contracted to a private firm. Source reduction efforts focused on recycling plastics, metals, glass, motor oil, and some paper products. Vernon County later opened a construction and demolition landfill (in 1995) at the same site to provide a lower cost option for the disposal of inert building materials.

The revised (2002) Vernon County Solid Waste Management Plan addressed future waste disposal alternatives in anticipation of the time when the existing disposal facilities are full. This revised plan recommended that construction/demolition waste be placed in the landfill once the construction/demolition waste landfill closed and that a vertical expansion be added to the landfill to extend its life.

Vernon County's Solid Waste Management Plan has not been updated since 2002. Although no update has been made, the proposed Expansion does not conflict with the County's approach and philosophy to managing waste. Vernon County believes in managing waste locally to provide cost effective waste disposal to its residents and in continuing to expand upon disposal alternatives, waste reduction, reuse, and recycling where opportunities arise. In 2018, Vernon County modified its policy to allow acceptance of out of county waste. However, out of county waste is not a significant source of incoming waste nor does Vernon County currently pursue out of county waste for purposes of adding additional revenue and/or becoming a regional facility.

2.4 Advisory and Public Opinion Process {Wis Stats. 289.24(1)(d)}

In accordance with s. 289.24(1)(d), the FR is required to contain a description of the advisory process undertaken by the applicant to provide information to the public and affected municipalities and to solicit public opinion on the proposed facility.

Throughout the existence of the Vernon County Landfill, the County has strived to strengthen community relations and outreach through various methods. Community outreach has included a mixture of delivery and communication approaches including direct mailings, local press releases and interviews, public tours, and engagement with local schools and at public events, special interest groups, and clubs. Following is a summary of examples of advisory and solicitation of public opinion efforts:

- Provide informative brochures via direct mailing to guide residents on recycling and waste disposal practices and pricing.
- Maintain solid waste and recycling information on the County website for residents to readily access for information on waste disposal, recycling, household hazardous materials (HHM) recycling, agricultural plastic film recycling, asbestos disposal, etc.
- Use of social media to inform residents of collection events, photographs of the facilities, and links to more information.
- Offer and host informative tours of the recycling center and landfill.
- Conduct monthly solid waste committee meetings that are open to the public.

Each of the above outreach efforts has focused on demonstrating the value of the services it provides to the community. The proposed Expansion will continue to provide a local option to support waste disposal services.

2.5 Ownership and Compliance with Plans and Orders {NR512.19}

According to NR 512.19, the FR shall identify all persons owning a 10% or greater legal or equitable interest in the applicant or in the assets of the applicant, including shareholders of a corporation, which is an applicant, and partners of a partnership, which is an applicant. The FR shall also identify all other Wisconsin solid or hazardous waste facilities for which the applicant or any identified person is named in, or subject to an order or plan approval issued by WDNR. In addition, the FR shall identify all other Wisconsin solid or hazardous waste facilities that are

owned by persons, including corporations and partnerships, in which the applicant or any identified person owns or previously owned a 10 percent or greater legal or equitable interest or a 10 percent or greater interest in the assets and include a statement indicating whether all plan approvals and orders relating to all identified facilities are being complied with.

The Vernon County Landfill, and associated facilities, are wholly owned by the County. The County does not own a 10% or greater interest in any other solid or hazardous waste facilities. Please refer to **Appendix D** for a copy of WDNR Inspection Reports (2019-2022) and compliance records. Two non-compliance letters were issued during 2021 and 2022 but Vernon County Landfill worked diligently to resolve these issues and a Return to Compliance Letter was issued by the WDNR on October 11, 2022. Vernon County Landfill was recently issued a notice of non-compliance in a letter dated August 23, 2023 by the WDNR for a minor infraction regarding daily cover. At the time, Vernon County was awaiting imported daily cover materials for placement over the active working face. Vernon County is currently addressing the issue and is anticipated to be resolved well before the WDNR's specified September 30, 2023 timeline.

3 General Facility Information {NR512.07 and Wis Stats. 289.24(1)(c)}

The following provides general facility information regarding the existing landfill and proposed Expansion as required by NR 512.07.

Name of Site:	Vernon County Landfill
License No.:	WDNR License No. 3268
Site Location:	Southwest and Southeast ¼ of Section 15, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin
Total Acreage	**Existing:** Total Facility: 250 acres Current MSW Landfill (Phases I-VI): 10.02 acres **Proposed:** Horizontal Expansion (Phases VII-XI): 4.57 acres Vertical (Overlay) Expansion: 9.58 acres
Owner/Permittee/Operator:	Vernon County Stacie Sanborn, Director of Solid Waste S3705 County Road LF Viroqua, WI 54665 Phone: 608.634.2900 Email: stacie.sanborn@vernoncounty.org
Landfill Address:	S3705 County Road LF Viroqua, WI 54665
Areas Serviced:	Vernon County
Expected Waste Type:	MSW, C&D, Special Waste
Estimated Waste Quantities:	**MSW:** 25,000 cubic yards per year 19,000 tons per year
Site Life and Calculated Closure Date:	**Existing MSW:** approximately 1 year, capacity expected to be reached during the Fall 2024 **Proposed MSW Expansion:** maximum 15-years (2024-2039)
Design Capacity:	**Existing MSW:** 590,000 cubic yards **Proposed MSW Expansion:** 427,355 cubic yards
Submittal Prepared by:	Short Elliott Hendrickson Inc. (SEH) 3535 Vadnais Center Drive St. Paul, MN 55110 Project Manager: Brian Kent, CHMM Project Engineer: Darryl Heaps, P.E. Project Geologist: Melanie Niday, P.G.

3.1 Project Title

Vernon County Landfill
Proposed Eastern Expansion
WDNR License No. 3268
Viroqua, Wisconsin

3.2 Primary Contacts

Owner, Operator, and Applicant:

Vernon County
Contact: Stacie Sanborn, Director of Solid Waste
S3705 County Road LF
Viroqua, WI 54665
608.634.2900
stacie.sanborn@vernoncounty.org

Engineering Consultant:

Short Elliott Hendrickson Inc.
Contact: Brian Kent
329 Jay Street Suite 301
La Crosse, WI 54601
608.498.4844
bkent@sehinc.com

3.3 Present and Proposed Property Owner

Vernon County
S3705 County Road LF
Viroqua, WI 54665

3.4 Proposed Landfill Location by ¼ - ¼ Section

The existing landfill and proposed Expansion are located in the SE ¼ of the SW ¼ and the SW ¼ of the SE ¼ of Section 15, T13N, R4W.

3.5 Total Acreage of Property and Proposed Fill Area

The existing landfill and proposed Expansion will be located on approximately 250 acres of contiguous property owned by Vernon County. The proposed fill area of the horizontal component of the Expansion is approximately 4-acres and the vertical component resides over an approximate 5-acre area of the existing footprint. The existing landfill plus the proposed Expansion will result in an approximate total landfill footprint of 15-acres.

3.6 Proposed Landfill Life and Design Capacity

The proposed Expansion will have a design capacity of approximately 427,355 CY. The design capacity is based on a maximum 15-year site life. Refer to Section 11 for more detailed discussion on proposed site life and anticipated closure date.

3.7 System Description and Municipalities Serviced

The Vernon County Landfill serves all municipalities, commercial businesses, and industry located within Vernon County which includes 21 townships, 9 villages, and three cities. Based on population estimates from the Wisconsin Department of Administration (WIDOA), the estimated population of Vernon County at the start of 2023 was 30,914.

The system accepts residential, commercial, industrial, and institutional wastes. Vernon County also serves as the recycling responsible unit for the municipalities within the County. The services offered by the system are consistent with Wisconsin's waste management policies. The system keeps transportation distances and costs low, as well as ensuring strong private sector competition by maintaining accessible, fairly priced services.

3.7.1 MSW Landfill

The MSW landfill was originally designed and permitted in early 1992 with three horizontal phases, a design capacity of 315,000 CY, and comprising of an approximately 10-acre footprint. A vertical expansion was approved in 2005, which included three additional vertical sequences and added 275,000 CY of air space.

The liner system for Phases I through III consists of a 5-foot-thick clay liner overlain with a 60-mil HDPE geomembrane liner. Phases I and III are underlain with a partial basin clay lined lysimeter. To date, all the permitted landfill cells have been constructed. Approximately 7-acres of the landfill has interim cover, and no final cover has been completed.

Waste currently placed in the MSW landfill includes MSW from County residences and commercial establishments, C&D waste, and industrial/special wastes. Per the WDNR tonnage report for 2022, approximately 33,769 CY of permitted airspace remains as of January 2023 in the MSW landfill. Based on recent filling rates, the existing permitted MSW landfill will be full in approximately the Fall of 2024. Copies of WDNR tonnage reports are provided in **Appendix E**.

3.7.2 Recycling Program

Beginning in 1991, the Vernon County Solid Waste and Recycling program has served as the Responsible Unit (RU) for the municipalities located within Vernon County except for the Town of Liberty. The recycling program provides roll-off containers and curbside delivery and pick up to each participating municipality. The source separated recycled materials are delivered to the recycling building, located at the landfill property, where they are further processed, sorted, and bailed for subsequent sale. The Vernon County recycling program was recognized with the WDNR Wisconsin Recycling Excellence Overall System Award during 2020.

3.7.3 C&D Debris

C&D debris that is not diverted prior to delivery to the landfill is placed in the MSW landfill.

3.7.4 Citizens Drop-off Area

Use of the landfill's public drop-off site is available to homeowners, renters, and businesses located within Vernon County. In 2019, the citizen's drop-off area was expanded to include bins for source separated recyclables and provides a valued convenience to the system users and is

much safer than allowing the general public access to the active landfill face and recyclable material processing areas with equipment operators and haulers. Drop off items include:

- Source separated recyclables (plastic, glass, tin, paper, metal)
- Tires
- Large items: Furniture and furnishings including upholstered items
- General household waste, toys, bikes, grills, lawnmowers (without gas and oil), mattresses, stoves, hot water heaters, washers, dryers, small appliances, and other items
- Demolition/Construction Debris: Wood, drywall, doors, windows, sinks, toilets, tubs, roofing, bricks, carpets, tile, and flooring
- Garbage: Normal household waste like bagged waste, paper, and food waste
- Other: Yard waste/grass clippings, shingles, brush, and animal carcasses
- Refrigerators, dehumidifiers, air conditioners

3.8 Anticipated Waste Types, Characteristics, and Volumes

It is anticipated that the future waste types and characteristics will remain very similar to the waste currently being received, and landfilled, at the facility. Slight changes may occur as the result of improvement to national, regional, and local recycling initiatives, such as food wastes or other high organic waste streams being diverted. Per the 2022 WDNR tonnage report, approximately 17,327 tons of waste was placed in the MSW landfill. Of this tonnage, approximately 94% was MSW, 5% was C&D material, and less than 1% was alternate daily cover (ADC) materials.

While not a significant source of tonnage, special waste is accepted at the landfill. Prior to accepting special wastes at the facility, each waste type and generator are thoroughly reviewed in accordance with the approved Special Waste Management Plan to ensure they are appropriate for disposal and will not negatively impact landfill operations. Special waste sources that are not appropriate are rejected as part of the application process and are not received at the facility.

Waste volumes can vary based on density, but typically Vernon County Landfill consumes approximately 25,000 CY of airspace annually. Waste intake can vary seasonally with less tonnage received in the winter months and higher tonnage over the summer months. Seasonal fluctuations are primarily driven by construction and recreation in the area. These tonnages and volumes already consider the effect of waste reduction and recycling initiatives as materials diverted from landfill, such as household recyclables, are not included in the tonnage or airspace consumption totals.

3.9 Anticipated Cover Frequency

Cover frequency will be daily, as is currently applied. Most of the daily cover utilized by the facility consists of sand imported to the site. When available, ADC, which are beneficially used waste products received at the facility, are utilized for daily cover. Currently the facility is approved to utilize the following waste streams for ADC:

Foundry Sand	Wood Chips	Petroleum Impacted Soil
Street Sweepings	Foundry Slag	Coal Bottom Ash

At least 6-inches of daily cover and/or ADC is placed on the active working face at the end of each day. To the extent feasible, the daily cover and ADC is removed at the beginning of each day and reused.

3.10 Mode of Operation

The Vernon County Landfill will continue to operate as an area fill with the following considerations:

- Segregate C&D material from MSW to the extent operationally feasible.
- Utilize a 10-foot "fluff" lift when placing waste on a newly constructed cell. The fluff lift consists of MSW that does not contain large items that could potentially pierce the liner.
- Separate disposal areas for asbestos containing materials, which are tracked and mapped.

3.11 Hours of Operation

Hours of operation are Monday through Friday from 7:30 am to 3:30 pm, and every second Saturday of each month between 8:00 am and 12:00 pm (noon).

4 Land Use Information {NR512.08}

4.1 Site Present Land Use

No changes to the present land use within the Expansion footprint or overall landfill property have occurred since submittal of the November 2021 ISR. The approximate 4.0-acres for the proposed horizontal expansion are currently vegetated grassland, wooded, and undeveloped, except for the current sedimentation basin along the east side of the existing landfill. The land immediately to the east and north of the landfill and proposed Expansion area is owned by Vernon County. It consists of a wooded ridge sloping rapidly to separate valleys, which converge approximately 5,000-feet to the northeast in the area of Seas Branch Pond. Beyond the wooded valley to the east are agriculture fields with a farm located approximately 1-mile east and a farm approximately 4,000-feet southeast. The Vernon County owned parcel east of the landfill entrance road and south of the landfill is the existing clay borrow source which is also used as cultivated agricultural croplands. Figure 5 in **Appendix F** depicts existing land use for the landfill property and surrounding land use within 1-mile of the proposed Expansion.

4.2 Surrounding Area Land Use

No changes to the surrounding land use have occurred since submittal of the ISR. Adjacent property to the north is wooded and decreases in elevation to the Seas Branch Stream, located approximately 1,500-feet from the landfill, which meanders along County Highway Y. Intermittent residential properties are located along County Highway Y, with the closest being approximately 1,900-feet from the landfill. Land use for property to the west of the landfill is a mixture of agriculture fields and wooded parcels. The closest residence to the west is located on County Road Y and is approximately 2,700-feet from the landfill. Land use for the property to the south of the landfill is also a mixture of agriculture fields and wooded parcels. The closest residence to the south is located on County Road LF and is approximately 1,500-feet from the landfill.

4.3 Land Use Zoning

No land use zoning changes have occurred since submittal of the ISR. The Vernon County Landfill property is located within the Town of Viroqua jurisdictional boundary. According to the Town of Viroqua Clerk, the township has adopted a zoning ordinance which is available on their website. Based on review of the draft ordinance and zoning map (Town of Viroqua 2017), the Vernon County Landfill property is located in a "Special Purpose District". Permitted uses in the special purpose district include the following uses, so long as such sites are secured in a sufficient manner to insure public and environmental safety, including meeting all applicable State or Federal standards and laws: Landfills and former Landfills; Junk Yards; and, chemical, biological, and/or hazardous material production or handling.

Based on review of the Town of Viroqua's zoning ordinance, current zoning will not require special applications or variances to facilitate the Expansion. Since the entire proposed Expansion footprint is located on Vernon County property, and does not require a purchase of agricultural property, an Agricultural Impact Statement will not be required.

As indicated in the WDNR's opinion to the ISI, the proposed Expansion is not located in a floodplain, conservancy, or shore land. In such, zoning ordinances relating to these instances are not applicable.

4.4 Adjacent Landowners

Review of Vernon County online land records in July 2023 indicated there have been six landowner changes to parcels adjacent to the Vernon County property since submittal of the ISR. Landowners whose property is contiguous to the landfill property boundaries and all residences located within 1,200 feet of the anticipated limits of filling are provided in **Appendix F**, Figure 2. Landowner changes since submittal of the ISR are indicated on this figure. Names and contact information for the landowners are summarized on Table 1 located in **Appendix F**. The proposed landfill Expansion footprint is located on property currently owned by Vernon County and the footprint is greater than 100-feet from any existing property boundary. In addition, there are no existing residences or private wells located within 1,200 feet of the proposed landfill Expansion footprint. The private well servicing the County's office and recycling center is located less than 1,200 feet from the existing landfill footprint but greater than 1,200 feet from the proposed Expansion area. On November 5, 1991, the WDNR issued the County a variance to install a potable well within 1,200-ft of the proposed landfill as discussed in Section 1.5. An exemption to NR 504.04 (3)(f) was granted within the Feasibility Determination for the previous vertical expansion dated June 28, 2004, to allow the expansion to occur within 1,200 feet of the existing private water-supply well that serves the balefill facility.

Properties contiguous to the County landfill property consist primarily of large vacant parcels of property owned by local residents. Following is a summary of the properties contiguous to the landfill property and a cross reference number showing their location on Figure 2 and Table 1 in **Appendix F**. Landowner changes of these parcels since submittal of the ISR are underlined.

- Randy and Karen Crume own two parcels to the north and east of the County property. One parcel (#1) is approximately 20-acres and is wooded and undeveloped. The second contiguous parcel (#2) is approximately 38-acres is being utilized for pasture, agricultural fields and agriculture buildings The Seas Branch Stream also meanders through the parcel.

- Randy Crume owns an approximate 5-acre parcel (#3) to the east of parcel #1 and north of the County property. The parcel is wooded and undeveloped. A portion of this parcel (approximately 2 acres) was formerly owned by Vernon County and appears to have been sold to Mr. Crume since submittal of the ISR.
- Gerald S Hanoski Trust owns an approximate 30-acre parcel (#4) of wooded undeveloped land east and north of the County property.
- K&M Herlitzke Farms LLC owns five parcels (#5, #6, #7, #12, and #13) to the east, southeast and south of the County property. The parcels comprise approximately 140-acres and are utilized for agriculture fields.
- Steven and Debra Clark own an approximate 20-acre parcel (#8) east of the County property. The property is wooded, and a small house or cabin is located in the south-central portion of the property.
- Wisconsin RSA #8 owns an approximate 9-acre parcel (#9) east of the County property. The parcel contains a telecommunication tower and a small building within a fenced and secured area. The building likely contains equipment associated with the telecommunications tower.
- The Zion Church owns an approximate 1-acre parcel (#10) to the southeast of the County property. The one-acre parcel is vacant except for a small rural cemetery.
- Jerome Butera Trust owns an approximate 5-acre parcel (#11) to the southeast. This property does not appear to directly adjoin Vernon County property. The property is developed and contains a residence.
- The John & Linda Kieler Revocable Trust owns three parcels (#14, #16, #18) south of the County property across County Road LF. The parcels comprise approximately 90-acres wooded and are utilized for agriculture fields.
- Robert & Tammy Menne own an approximate 4-acre parcel (#15) south of the landfill property across County Road LF. The property is utilized as a residence and for agriculture related activities.
- Chad Williams owns an approximate 4-acre parcel (#17) south of the landfill property. The property is utilized as a residence. The William's private well is routinely sampled as part of the existing WDNR plan of operation approval.
- Wayne Kruizenga owns an approximate 28-acre parcel (#19) west of the landfill property. The property is vacant is utilized as an agriculture field.
- Rodney Wiebe owns two contiguous parcels (#20 & #21) west and northwest of the landfill property. The parcels comprise approximately 80-acres and are a mixture of wooded areas, agriculture fields and pasture. County Road Y and the Seas Branch Stream meander through the northernmost parcel (#21).
- Grace Acres LLC own two contiguous properties (#22 & #23) north and northwest of the landfill property. The parcels comprise approximately 28-acres and contain a mixture of wooded areas, agriculture fields and pasture. The Seas Branch Stream meanders through the parcel #22 and a residence and outbuildings are located on the north side of the Seas Branch Stream.

4.5 Recreational, Historical, Archaeological and Critical Habitats

4.5.1 Recreational Areas

There are no recreational areas on and in the vicinity of the landfill property.

4.5.2 Historical and Archeological Sites

As required by Wis. Stat. §44.40, the WDNR performed a review of the area to determine if any known historic, scientific, or archeological areas exists at or near the proposed facility. On October 2, 2020, Laura Spears, WDNR Wastewater Specialist, issued a letter summarizing the findings of an endangered resources (ER) and cultural/historic review for the proposed Expansion as part of the ISI request. The ER and cultural/historic review were updated in an August 31, 2021, letter issued from Laura Spears, which included the additional area provided in the revised ISI request. Copies of the above letters were included with the ISI request which is included in **Appendix B** to this FR. The ER review was updated on August 18, 2023 which continued to indicate there are no cultural or historic concerns for this parcel. The updated ER review is also included in **Appendix B**.

4.5.3 Critical Habitats and Endangered Resources

The WDNR has conducted a review of the area for occurrences of Endangered, Threatened, or Special Concern Species, natural communities, or State Natural Areas in accordance with Wis. Stat. §26.604(4). Per WDNR review and subsequent August 18, 2023 renewed ER review, there are no record of the above occurrences that would be impacted by the proposed project. A copy of the August 18, 2023 ER review from the WDNR is included in **Appendix B**.

4.6 Federal Aviation Administration

The proposed landfill Expansion is located approximately 2.7 miles (>15,840 feet) northeast of the closest runway at the Viroqua Airport and is not located in the approach or departure path for the airport. Since the Expansion is located less than 5 miles from the airport, the County has issued a letter dated October 23, 2020 to the Federal Aviation Administration (FAA) notifying them of their intent to expand. A copy of the notification letter is attached in **Appendix F**, "FAA Correspondence."

Review of applicable regulations regarding landfill siting and expansions near airports indicate that the requirements of 49 USC Section 44718(d) apply only to new municipal solid waste landfills (MSWLF's), which are defined as a municipal waste landfill that was established or constructed after April 5, 2000. Furthermore, FAA Advisory Circular AC No. 150/5200-34A states that 49 USC Section 44718(d) does not apply to the expansion or modification of an existing MSWLF. The current active Vernon County Landfill was first constructed in 1993, therefore exempt from the limitations of 49 USC Section 44718(d).

As part of the last expansion process, Vernon County issued a letter to the FAA on May 29, 2002 notifying interested parties of their intention to expand. In a letter dated June 16, 2002 the FAA responded with a letter concurring with the proposal relative to compatibility standards contained in FAA Advisory Circular AC No. 150/5200-33, with the following conditions:

1. The landfill facility must be properly supervised to assure that the bird populations are not increasing and that appropriate control procedures are being followed.
2. Any increases in bird activity that might be hazardous to safe aircraft operations will result in prompt mitigation actions and/or closure of the landfill.
3. The above conditions must be clearly defined via State/Local licensing procedures associated with establishment of the landfill.

4. The landfill owner/operator should develop and implement a Wildlife Hazard Management Plan for operation of the landfill.

A Wildlife Hazard Management Plan (Plan) was included in their Plan of Operation, which has been approved by the WDNR and part of the facility operating record. The Plan utilizes the following strategies:

- Minimization of standing water areas
- Minimization of uncovered waste areas
- Prompt revegetation of disturbed areas outside of the waste footprint
- Utilization of bird harassment techniques, perch deterrents, and avoidance structures, as needed

The FAA does not approve or disapprove of solid waste landfill locations but is primarily concerned about location relative to safety. With issuance of the attached notification letter, it is anticipated that the FAA may reply with additional conditional actions to address safety concerns.

In an electronic mail dated March 19, 2021 Bobb Beauchamp, Environmental Protection Specialist with the FAA, confirmed that the landfill expansion is exempt from the requirements of 49 USC Section 44718(d) and encouraged the continued use and implementation of the Plan. The FAA also indicated that the Viroqua Airport does not have regularly scheduled service in addition to general aviation operations, so the provisions of FAA AC 150/5200-34A, Construction or Establishment of Landfills Near Public Airports also does not apply.

A copy of the October 23, 2020, notification and March 19, 2021 FAA response was provided with the ISR which is included in **Appendix B** to this FR.

4.7 Transportation and Access

No changes are proposed to the existing landfill access. The main roads leading to Viroqua and the landfill include US14/State Highway (STH) 27 to the north, STH56 from the West, STH56/82 from the east, US14 from the south, and STH27/82 from the southwest. Once in Viroqua, or Westby to the north, access to the landfill is gained by turning east on County Road (CR) Y from US14/STH27. Travelling east on CR Y, then turn south on CR LF to the landfill property entrance located on the north side of CR LF. There are no weight restrictions on US14 and STH56, STH82 or STH 27. The county roads have weight restrictions during a brief period in the spring which 6 tons for single axle vehicles and 10 tons for double axle vehicles. Weight restrictions are not enforced on local town roads.

4.8 Existing Land Uses Which May Have an Impact on Suitability

There are no existing land uses within one mile of the landfill that will have a negative impact on the suitability of the proposed Expansion. The closest residence to the existing landfill is located approximately 1,500-feet to the south and is shielded from the operations view due to topography and wooded parcels. Agricultural activities in the area have not historically impacted site operations, or vice versa. Very little residential development has occurred near the landfill since the landfill was initially permitted.

4.9 Cause and Significance of Groundwater Standard Exceedances

The parameters of iron, fluoride, manganese, and nitrate+nitrite exceed the NR 140 Wis. Adm. Code regulatory limits within several wells at Vernon County Landfill. In accordance with NR 140.28 Wis Adm. Code, exemptions to select groundwater quality standards have been requested, and approved by the WDNR as part of the 2003 feasibility determination for the last expansion. Although these exceedances of several inorganic parameters exist on-site, they are thought to be due to background conditions and there is currently no evidence that the active MSW Landfill (WDNR License No. 3268) has caused groundwater contamination at the facility.

4.10 Impacts of Expansion on Groundwater Quality

No groundwater quality impacts associated with the historic solid waste disposal operations have been identified at the site. Due to the design requirements for the existing and proposed landfill Expansion, including an engineered liner/cover and leachate collection, the proposed Expansion should not adversely impact groundwater quality.

4.11 Areas Where Land Uses Would Be Affected by Proposed Landfill Expansions

There are not areas where land uses would be affected by the proposed landfill Expansion. The proposed Expansion is located entirely on existing property owned by Vernon County. The land use on properties adjacent to the landfill property are not anticipated to change.

5 Geology and Hydrogeology {NR512.085, NR512.09, NR512.10, and NR512.11}

The intent of a geotechnical program completed as part of a feasibility study is to characterize the soils, bedrock geology, and groundwater flow system associated with a proposed landfill site through field investigation, laboratory testing, and data analysis. The information collected is then used to evaluate the suitability of the proposed site for landfill development in reference to the physical and chemical site conditions and the geotechnical engineering properties of the site.

Regional and site-specific geotechnical information has been collected historically at the Vernon County Landfill and provided to WDNR at various investigative phases since approximately 1987. WDNR landfill licenses attained to-date include an approximate 10-acre municipal solid waste landfill (WDNR License No. 3268) and a closed small sized (50,000 cubic yard) C&D Landfill (WDNR License No. 3712). Other facilities include: a recyclable material processing and baling facility. The previously permitted areas, site facilities, and the proposed landfill expansion area are depicted on **Plan Sheet 3**.

5.1 Alternative Geotechnical Investigation Program (AGIP)

On December 13, 2021, an Alternate Geotechnical Investigation Program (AGIP) request was sent to Ms. Carolyn Cooper, WDNR district hydrogeologist, requesting approval for an alternative geotechnical program as allowed under NR512.09 Wis. Adm. Code. The WDNR accepted the AGIP in a letter submitted to Vernon County Landfill on March 30, 2022, with several comments. On June 9, 2022, representatives of Vernon County and SEH held a conference call with Ms. Cooper to discuss the details of the alternative geotechnical program approval. Following the

conference call, a Response to the AGIP Acceptance Letter (SEH, July 25, 2022) was sent to Ms. Cooper summarizing the items discussed and agreed upon on the conference call.

A copy of the AGIP Request and the Response to the AGIP Acceptance Letter are provided in **Appendix I**. The AGIP approval was granted in a letter from the WDNR dated March 30, 2022 (**Appendix B**). The letter gave approvals and exemptions for the following:

- NR507.05(2) Wis. Adm. Code for bedrock coring – attempt bedrock coring at one location and complete geophysics in order to provided sufficient data on bedrock.
- NR507.06(1) Wis. Adm. Code for use of drilling fluids - drilling fluids can be used when conditions warrant it and an exemption from the code isn't required.
- NR512.06(4)(a) Wis. Adm. Code for grain size analysis of bedrock - grain size analysis is required as appropriate for the particular type of material and an exemption from the code isn't required.
- NR512.09(4)(b) Wis. Adm. Code for hydraulic conductivity of fine-grained units – samples should be attempted from weathered and competent bedrock. Hydraulic conductivity analysis data previously collected will be allowed to be used towards meeting Code requirements.
- NR512.09(4) Wis. Adm. Code for use of soil laboratory data collected during past investigations – the use of previously collected data is allowed.
- NR512.09(1) and (2) Wis. Adm. Code for use of existing borings and wells primarily in the existing landfill footprint and the previous Closed Landfill area - use of existing borings and wells is approved.
- NR512.09(4)(g) Wis. Adm. Code for use of existing groundwater quality data - the use of previously collected data is allowed.
- NR512.11(2) Wis. Adm. Code for use of all borings in the geological cross-sections - all borings, wells, and piezometers within 300 feet of the limits of the vertical and horizontal expansion much be included within the geological cross-sections.
- NR507.14 and NR 140.23 Wis. Adm. Code for use of soil boring and well information not on WDNR forms - the department understands some historic soil borings logs may be recorded on non-department forms. All available boring logs within 300 feet of the proposed limits of the vertical and horizontal expansion that were used for previous feasibility reports should be provided.

Based on a proposed horizontal landfill expansion area of 4 acres, a geotechnical investigation including 10 soil borings, five water table monitoring wells, and four piezometers is required. The accepted AGIP includes utilization of data from 18 existing soil borings, three existing perched water table monitoring wells (MW-4P, MW-5A, and MW-12), two existing regional water table monitoring wells (MW-5 and MW-14), and five existing nested piezometers (MW-3, MW-6, MW-10, MW-11, and MW-14Z). In order to meet the regulatory requirements and further investigate the subsurface in the area of the proposed expansion, eight new borings (B-18, B-19, B-20, B-21, MW-14WT, MW-15WT, MW-16, and MW-17WT) were performed to provide bedrock data and additional soil data. Four new perched water table monitoring wells (MW-14WT, MW-15WT, MW-16WT, and MW-17WT), and one new regional water table monitoring well (MW-16) were also completed during the investigation of the proposed expansion area to meet regulatory requirements and provide groundwater data in accordance with the approved AGIP.

5.2 Field Investigation

The field investigation was completed in accordance with the AGIP Request, WDNR AGIP Approval Letter, the Response to the AGIP Acceptance Letter, and NR512.09 Wis. Adm. Code.

Drilling and monitoring well/piezometer installation for the AGIP was conducted during August and September 2022. Drilling to identify the bedrock surface elevations and to install new monitoring wells and piezometers was performed by Braun Intertec (Braun) under the direction and supervision of a Wisconsin certified SEH Professional Geologist. Monitoring well development, geophysics, groundwater sample collection, and in-situ hydraulic conductivity testing were also conducted by SEH geologists and scientists under the direction and supervision of a Wisconsin certified SEH Professional Geologist. Groundwater sample analysis was performed by Eurofins Environment Testing (Eurofins). The new soil boring, monitoring well, and piezometer locations are shown on **Plan Sheet 3**, along with existing borings, wells, and piezometers in the proximity of the proposed expansion area which were utilized during the investigation and groundwater monitoring program.

A summary of all field investigation methods and procedures is provided within the AGIP Field Investigation Procedures Memo included within **Appendix J**.

5.3 Physiographical and Geological Setting

The following subsections include information on regional geologic, hydrogeologic, and topographic conditions at the site and in the vicinity.

5.3.1 Regional Setting

The proposed landfill Expansion lies within the west central portion of the West Fork Kickapoo River Watershed which is part of the Lower Wisconsin River Basin. This area of sedimentary rocks is unglaciated, as it is part of the “Driftless Area”, and has narrow, steep-sided bedrock ridges, narrow stream valleys, and few natural lakes. The upper reaches of the streams have V-shaped valley cross-sections and fairly steep gradients. Downstream reaches generally have thick alluvial fill in which the present stream channel is incised. The sedimentary rocks that underlie the basin dip gently and thicken to the south and southwest, conforming to the surface of the underlying Precambrian bedrock. Surface-water drainage is controlled generally by the topography of the bedrock surface. The northern portion of the site drains to the north to Seas Branch Creek which then flows east towards the west fork of the Kickapoo River. The southern portion of the site drains to the south to an unnamed tributary which then flows northeast to Seas Branch Creek and then east to the west fork of the Kickapoo River. More regionally surface water drainage is to the southeast towards the Kickapoo River. In the vicinity of the site, depth to the regional groundwater system ranges from 80 to 180 ft bgs and generally flows to the north towards the Seas Branch Creek.

5.3.2 Regional Topography

The area in the vicinity of the proposed landfill Expansion consists of dolostone bluffs and coulees. The maximum elevation in the surrounding area is approximately 1,260 ft (United States Geological Survey (USGS) datum) while the minimum elevation is approximately 980 ft (USGS datum). The site is located on a dolostone bluff that is oriented in the northeast to southwest direction. To the north of the site is the Seas Branch Creek, to the east and south surface

drainage to the Seas Branch Creek, and to the west a continuation of the dolostone bluff. Refer to the topographic map provided in **Appendix F** for further details.

5.3.3 Regional Hydrology

The site is located within the West Fork Kickapoo River Watershed with regional surface water draining to the Kickapoo River Watershed. Surface water from the northern portion of the site drains to the north to Seas Branch Creek which then flows east towards the west fork of the Kickapoo River. Surface water from the southern portion of the site drains to the to an unnamed tributary which then flows northeast to Seas Branch Creek and then east to the west fork of the Kickapoo River. More regionally surface water drainage is to the southeast towards the Kickapoo River. The West Fork Kickapoo River Watershed is bound to the north by the Coon Creek Watershed and the Middle La Crosse River Watershed, the east by the Bear Creek-Kickapoo River Watershed, the south by the Tainter Creek-Kickapoo River Watershed, and the west by the Bad Axe River Watershed.

The annual average precipitation in the region as measured over a 30-year period (1992-2022) is approximately 34.86 inches with a range of 23 inches (2003) to 44 inches (2016) (National Weather Service, 2023). Average annual snowfall in the region within the same 30-year period (1992-2022) is approximately 46 inches with a range of 21.5 inches (2012) to 69.2 inches (1997) (National Weather Service, 2023).

Significant surface water bodies or drainage in the vicinity of the site include Seas Branch Creek (approximately 1,500 feet north of the proposed expansion), an unnamed intermittent creek (approximately 750 feet south and southeast of the proposed expansion), and Seas Branch Pond (approximately 0.90 miles to the northeast) that is formed due to a wet flood control structure or dam.

Locally, minor wetlands exist north and south of the proposed landfill Expansion area within surface water drainage features and Seas Branch Creek. A more extensive wetland is present northeast of the Site as part of Seas Branch Pond.

5.3.4 Regional Geology

5.3.4.1 Near Surface Soils

Based on review of the Web Soil Survey for Vernon County (USDA, accessed July 2023), a large portion of the existing landfill is designated “2050” for “landfill”, indicative of disturbed or developed areas. A soil survey for the landfill property is provided in **Appendix F**. The remaining soil cover within the landfill expansion area including the following soil types:

- Seaton Silt Loam (115D2), driftless ridge, 12 to 20 percent slopes, moderately eroded.
- Basco Silt Loam (234D2), 12 to 20 percent slopes, moderately eroded.
- Pepin Silt Loam (125D2), 12 to 20 percent slopes, moderately eroded.
- Valton Silt Loam (133C2), 6 to 12 percent slopes, moderately eroded.
- Mt. Carroll Silt Loam (114B2), 2 to 6 percent slopes, moderately eroded.

5.3.4.2 Unconsolidated Deposits

Unconsolidated deposits in the vicinity of the site generally consist of alluvium in the river and stream channels and terraces deposited during Holocene time. These soils are typically fine grained and range from clays to medium sands (Young, 1973). The project area is situated in the

unglaciated driftless zone of southwestern Wisconsin. As a result, unconsolidated materials away from stream channels are generally associated with windblown deposition or mass wasting that occurred during the Late Pleistocene.

Evans (2003) also describes rolling topography along the lower slopes of the Paleozoic bedrock ridges as evidence of the downslope movement of the primarily sandstone and dolostone bedrock due to mass-wasting processes. Colluvium deposits are generated from the weathering and subsequent re-deposition of materials comprising the sandstone and dolostone bluffs in the region. A thin layer of loess (silt) is often found on the surface or buried below colluvium across the region. Residuum deposits are generated from in-place weathering of the sandstone and dolostone bedrock. Thickness of unconsolidated deposits in the vicinity of the site ranges from 0 to 50 feet in upland areas, to over 200 feet in stream valleys (Young, 1973).

5.3.4.3 Bedrock Geology

The bedrock geology generally consists of Paleozoic sedimentary beds overlying pre-Cambrian basement rock. The Paleozoic rock units generally have a regional dip to the southwest at a rate of approximately 10 feet per mile, which largely parallels the Precambrian surface (Evans, 2003).

The uppermost sedimentary bedrock units in Vernon County within the vicinity of the site consist of Ordovician aged dolostone, sandy dolostone, and dolomitic sandstone of the Oneota and Shakopee Formations (Prairie du Chien Group). The Prairie du Chien Group is underlain by the Cambrian aged sandstone and dolomitic siltstone of the Jordan Formation and St. Lawrence Formation (of the Trempealeau Group), the glauconitic sandstone of the Lone Rock Formation (of the Tunnel City Group), and the quartz sandstone of the Wonewoc Formation (of the Elk Mound Group) (Ostrom, 1981).

Based on regional publications by Young (1992), Hindall and Borman (1974), Young and Borman (1973), the bedrock encountered at Vernon County Landfill is the Prairie du Chien Group. It appears that all on-site borings terminate within the lower part of the Prairie du Chein Group. Based on boring logs from the City of Viroqua municipal wells, the Jordan Sandstone should occur approximately 250 feet below ground surface on-site.

The Prairie du Chien Group consists of the upper Shakopee Formation and the lower Oneota Formation. The Shakopee Formation is further divided into the Willow River and New Richmond members. The Oneta Formation is further divided into the Hager City and Stockton Hill members. The Stockton Hill Member is the basal member of the Prairie du Chien Group and is characterized by silty to sandy dolostone and dolomitic sandstone. The Hager City Member is characterized by thin to medium beds of laminated and stromatolitic dolostone with little to no silt or sand. The New Richmond Member is characterized by fine-grained, feldspathic quartz sandstone. The Willow River Member is the upper-most member of the Prairie du Chien Group and is characterized by stromatolitic and wavy laminated sandy dolostone.

The Jordan Formation has not been encountered during on-site drilling but underlays the Prairie du Chien Group. The Jordan Formation is characterized by a quartz-rich sandstone with medium to large-scale sets of cross-stratification. The St. Lawrence Formation underlies the Jordan Formation and is characterized by thin-bedded sandy dolomite, dolomitic sandstone, and dolomitic siltstone. The Lone Rock Formation underlays the St. Lawrence Formation and is characterized by thin to medium-bedded, cross-stratified, very fine to fine grained sandstone that is brown to greenish brown in color due to the presence of the green-black mineral, glauconite. The Wonewoc Formation underlies the Lone Rock Formation and is generally comprised of buff

to white, fine to medium grained sandstones. The very fine to fine grained quartz sandstones, sandy siltstones, and shales of the Eau Claire Formation underlie the Wonewoc Formation in Vernon County. The Mount Simon Formation is the bottom most Cambrian unit in Vernon County. The formation is largely comprised of medium to coarse grained sandstone containing abundant well-rounded quartz grains (Evans, 2003).

Precambrian igneous and metamorphic basement rock is present below the Paleozoic deposits in Vernon County. These rocks consist of Archean Gneiss and early Proterozoic granite and rhyolite. These rocks originated from Precambrian intrusions and volcanic events, or subsequent metamorphosis of these rocks.

5.3.5 Regional Hydrogeology

Regional hydrogeologic reports recognize six hydrogeologic units in Vernon County within the vicinity of the site: 1) St. Peter-Prairie du Chien-Jordan aquifer, 2) St. Lawrence-Lone Rock confining unit, 3) Wonewoc aquifer, 4) Eau Claire confining unit, 5) Mt. Simon aquifer, and 6) Precambrian confining unit (Young, 1992; Mandle and Kontis, 1992; Olcott, 1992).

As stated above, the deepest on-site borings terminate within the basal member of the Prairie du Chien Group, meaning that the St. Peter-Prairie du Chien-Jordan aquifer is the only hydrogeologic unit being monitored on-site.

Within Vernon County, the St. Peter-Prairie du Chien-Jordan aquifer is typically the uppermost aquifer but has a limited potential. According to Hindall and Borman (1974), well yields from this formation average less than 15 gallons per minute (gpm). Therefore, this aquifer typically provides sufficient yield for individual domestic wells but not public supply wells. Domestic well logs within the vicinity of the site confirm this with maximum construction depths of 300 feet, which places them within the St. Peter-Prairie du Chien-Jordan aquifer.

The deeper aquifers of the Wonewoc Formation and the Mt. Simon Formation can yield more than 500 gpm and therefore these aquifers are typically used for public supply wells. The closest municipal well (Viroqua's Well No. 5) is located approximately 2.7 miles southwest of the site and draws its water from both the Wonewoc and Mt. Simon aquifers.

In the vicinity of the site, the St. Peter-Prairie du Chien-Jordan aquifer system is typically hydraulically connected to streams because of steep topography within the region. The degree of this connection, however, is affected by the permeability of the deposits comprising the aquifer. The most permeable deposits have the greatest connection to streams, but the connection decreases with decreasing permeability.

Groundwater in the aquifer system moves from recharge areas at or near the outcrop of the aquifer to discharge areas, which is regionally the Kickapoo River and its tributaries. In the vicinity of the Vernon County Landfill and the proposed expansion, the main discharge area is north of the site at Seas Branch Creek. Regional groundwater in the vicinity of the site flows primarily to the north to northeast, towards Seas Branch Creek.

The majority of the regional groundwater flow within the Cambrian aquifer system occurs within the Mt. Simon aquifer which is generally under a leaky artesian (confined) system and moves toward the Mississippi River, the regional discharge area. Although individual aquifers in the system are separated by confining units that may be much less permeable than the aquifers, some water moves vertically through these confining units. Hydraulic heads in the individual

aquifers of the Cambrian aquifer system generally are at successively lower altitudes, which indicated that water moves vertically downward into the aquifer system in most areas (Olcott, 992).

Depth to the water table in the vicinity of the site depends largely on topography and ranges from 0 to almost 200 ft bgs. The extreme depths occur in regions where the water table is near the surface in valleys and is deep below ridges (Young and Borman, 1973).

5.3.6 Regional Water Quality

5.3.6.1 Regional Groundwater Quality

Groundwater in the Lower Wisconsin River Basin is generally of good quality and is usable for most purposes. The quality, though, is variable depending on the concentrations of dissolved solids and chemical constituents. The main chemical constituents in the water in the basin are calcium, magnesium, and bicarbonate ions. Hardness as calcium carbonate is estimated to be between 100 to 400 milligrams per liter (mg/L) (Hindall and Borman, 1974).

Regional differences in the quality of groundwater are due to the composition, solubility, and surface area of the particles of soil and rock through which the water travels, and due to the length of time the water is in contact with these materials. Water from the sandstone aquifer system is not greatly mineralized in areas where the aquifer crops out or is buried only to shallow depths, but mineralization increases downgradient where the aquifer is deeply buried.

Since the region is predominately agricultural, often the contaminants found in the groundwater are the result of agricultural land use practices. Some of the documented groundwater quality issues in this region include nitrate, bacteriological, nutrients, pesticides, and herbicides. The potential for groundwater contamination within the West Fork Kickapoo River Watershed is considered high due to over 50% of the land is used for agriculture (WDNR, 2002).

5.3.6.2 Regional Surface Water Quality

The chemical quality of surface water in the Lower Wisconsin River Basin is generally good. The water is generally calcium magnesium bicarbonate type, similar to groundwater described in Section 5.3.6.1.

The primary water quality concerns are caused from nonpoint sources of pollution, particularly from agricultural operations, excessive populations of rough fish, and hydrologic modifications of the streams such as damming, straightening, and the ditching, draining, or other alternation of wetlands. The potential for surface water contamination within the West Fork Kickapoo River Watershed is considered high due to over 50% of the land is used for agriculture (WDNR, 2002).

5.4 Subsurface Data Analysis {NR512.10 and NR512.11}

The following subsections discuss data collected and analyzed from the newly installed wells and includes information from previous investigations at the Vernon County Landfill. Subsurface data analysis was completed in accordance with the AGIP Request (SEH, December 13, 2021), the WDNR AGIP Approval Letter (WDNR, March 30, 2022), the Response to the AGIP Acceptance Letter (July 27, 2022), and NR 512.10 Wis. Adm. Code. The locations of the wells and boreholes are shown on **Plan Sheet 3**. **Appendix J** through **Appendix Q** provide supplemental data and information to support the following subsections.

5.4.1 Site Geology

Information regarding site geology was obtained from recent and previous site investigations. A summary of new and previously completed soil borings located within 300 feet of the proposed expansion is provided on **Table 5-1**. A summary of geotechnical data from the landfill property is provided on **Table 5-2**. Soil boring logs used to meet the investigation requirements are included in **Appendix K**. Laboratory soil geotechnical test results are provided in **Appendix L**. Geologic cross-sections of the site are shown on **Plan Sheet 11** through **Plan Sheet 22**.

The uppermost site geologic units have been defined in reference to three primary depositional environments as follows: Unconsolidated deposits including loess and residuum; saprolite; and dolostone bedrock. For purposes of site characterization, saprolite refers to weathered bedrock retaining details or structural features of the bedrock and, residuum, while also formed from bedrock, no longer retains the structural features or details of its bedrock and represents a true unconsolidated deposit. The following sections describe the physical characteristics of the unconsolidated deposits and the dolostone bedrock as determined from soil borings and geotechnical analysis.

5.4.1.1 Unconsolidated Deposits

The Vernon County Landfill is in the unglaciated “driftless” zone of southwestern Wisconsin. As a result, the unconsolidated deposits at the Vernon County Landfill consist of loess and residuum deposits overlying dolostone bedrock. In some areas, saprolite separates the unconsolidated deposits from the dolostone bedrock below. Generally, the more competent saprolite and dolostone bedrock are distinguished by refusal during standard penetration testing.

The total thickness of unconsolidated sediments identified within borings completed within 300--feet of the proposed landfill expansion ranges from approximately 14.0 feet (MW--3/MW--4P/MW--6) to 79.5 feet (MW-10/MW-11/MW-12). The variability in unconsolidated soil thickness is a result of the land surface topography and the topography of the upper bedrock surface. In general, the residuum is thicker within valleys due to greater weathering occurring as water moves downslope away from more resistant bedrock that forms ridges in the area. The distribution of loess and residuum deposits is presented on the site cross-sections (**Plan Sheet 11** through **Plan Sheet 22**).

5.4.1.1.1 Loess Deposits

Loess soils at the Vernon County Landfill vicinity consists of windblown fine-grained sediment deposited during the Late Pleistocene. These deposits are discontinuous at the site, particularly because most loess has been removed as part of site development. Where present, loess deposits can generally be described as light brown to brown to gray, clayey silt to silty clay to clay with silt (ML to CL). Thickness of loess soils in the vicinity of the proposed landfill expansion area range from 0 to 10 feet with the greatest thickness found along ridges in undeveloped portions of the landfill property.

A total of 24 loess geotechnical samples have been analyzed for grain-size across the landfill property as shown on **Table 5-2**. The average grain-size distribution for loess deposits is 0 percent gravel, 1.6 percent sand, and 98.8 percent fines (silt and clay). The additional tests conducted on the fines indicate an average of 73.9 percent silt and 25.0 percent clay. Atterberg limits were determined for 21 samples resulting in an average liquid limit of 37.7 percent and a plasticity index of 15.6.

5.4.1.1.2 Residuum Deposits

Residuum deposits on the landfill site were generated from the weathering of the underlying dolostone bedrock. Although residuum originates from bedrock, the extent of weathering has removed all bedrock structure and it is therefore considered an unconsolidated deposit. The residuum can be generally described as brown to red brown to red, clay (CL) with to trace sand and gravel to clayey sand (SC) with to trace gravel. The thickness of the residuum deposits identified in historic borings performed in the vicinity of the proposed landfill expansion area ranges from approximately 14.0 to 79.5 feet. As described above, the residuum is generally thicker within valleys due to greater weathering occurring as water moves downslope away from more resistant bedrock that forms ridges in the area.

A total of 49 fine-grained residuum and 24 coarse-grained residuum geotechnical samples have been analyzed for grain-size across the landfill property as shown on **Table 5-2**. The fine-grained and coarse-grained units are present due to layering within the original bedrock prior to weathering. The fine-grained residuum samples taken from the landfill property indicate an average grain-size distribution of 1.9 percent gravel, 18.3 percent sand, and 76.2 percent fines (silt and clay). The coarse-grained residuum samples taken from the landfill property indicate an average grain-size distribution of 9.1 percent gravel, 59.7 percent sand, and 24.6 percent fines (silt and clay). Atterberg limits were determined for 45 fine-grained residuum and 7 coarse-grained residuum samples. For the fine-grained residuum the samples resulted in an average liquid limit of 55.4 percent and an average plasticity index of 31.6. For seven (7) of the 24 coarse-grained residuum samples, the clay content was high enough to establish Atterberg limits that resulted in an average liquid limit of 19.9 percent and an average plasticity index of 18.0.

5.4.1.2 Saprolite

Saprolite on the landfill site was generated from the weathering of the underlying dolostone bedrock. Unlike residuum, the saprolite unit still holds the original bedrock structure and is therefore more similar to bedrock than an unconsolidated deposit. The saprolite can be generally described as weathered dolostone to weathered dolostone with silty sand to weathered dolostone with clay. As with the residuum, the physical variability of the saprolites is due to layering within the original bedrock prior to weathering.

During the 2022 drilling investigation, water or drilling mud loss was noted at MW-16 beginning at 70 feet below the ground surface. This water loss was noted above the water table within saprolite described as highly weathered with sand layers throughout. Weathered shale was also noted above and below this interval. As a result, this loss of water was concluded to not be due to fractures within the formation but was most likely due to the highly weathered sandy dolostone between two layers of lower permeability shale. The high head exerted within the borehole from the mud rotary drilling method is able to force the mud or water into the unsaturated, more permeable layers of the formation.

Since the saprolite unit still holds the original bedrock structure, the top of the saprolite surface, where it is present, will be used for bedrock separation for the proposed subbase elevations. See Section 5.4.1.3 for further discussion on the bedrock surface elevations encountered within the footprint of the proposed landfill Expansion. A bedrock surface map, including saprolite, for the entire landfill property is provided on **Plan Sheet 10**; areas where saprolite is included in the bedrock surface illustrated are shaded. Saprolite surface elevations, depths to saprolite, and saprolite elevations for the proposed expansion area are provided in **Table 5-1**.

5.4.1.3 Dolostone Bedrock

The uppermost bedrock formation in the proximity of the proposed landfill expansion area has been established as the Ordovician-aged Hager City Member of the Prairie du Chien Group. The Hager City Member is characterized by thin to medium beds of laminated and stromatolitic dolostone with little to no silt or sand (Evans, 2003). The Stockton Hill Member, which is the basal member of the Prairie du Chien Group and is characterized by silty to sandy dolostone and dolomitic sandstone and appears to be encountered on-site as well. As stated previously, all on-site borings terminate within the lower part of the Prairie du Chein Group; based on boring logs from the City of Viroqua municipal wells, the Jordan Sandstone would occur on-site at an elevation of around 1000 feet NAVD.

Coring of bedrock on-site has had variable success and during the 2022 drilling investigation, bedrock coring was attempted at the MW-14WT location. Coring was attempted at several depths once bedrock was encountered but coring proved difficult and produced poor RQD results. All coring occurred above the water table to a depth of 60.5 feet bgs (groundwater was encountered at 94 feet bgs). Eventually, coring rods became stuck, and coring was deemed infeasible to continue at the MW-14WT location. As indicated on the coring log in **Appendix K**, observations of the rock core described the bedrock as highly fractured and the presence of small voids. Historical rock core logs also observed fractures and small voids within the uppermost bedrock, particularly above the water table. However, logs from sonic borings could not distinguish the presence of voids and fractures due to the disturbance produced from the sonic drilling methods. Therefore, bedrock coring at the site has resulted in the following observations and conclusions:

- Dissolution cavities and bedrock fractures associated with dolomitic rock are primarily present above groundwater in bedrock on-site.
- Dissolution cavities occur primarily as small voids and do not appear to be interconnected.
- Bedrock, in general, is often highly fractured and the fractures are likely interconnected.
- Under hydraulic conditions, fractured bedrock above the water table would likely function as a porous media with only localized shale and clay layers providing limitations to the vertical percolation of water.

The saprolite and dolostone bedrock surface elevation encountered within the footprint of the proposed landfill Expansion area had elevations ranging from approximately 1221.0 (B-18) to 1195.0 (B-20) feet NAVD. The top of the saprolite and dolostone bedrock is currently approximately 17 feet below (B-18) to 23 feet below (B-20) the proposed subbase elevations. A bedrock surface map, including saprolite, for the entire landfill property is provided on **Plan Sheet 10**. Bedrock surface elevations, depths to bedrock, and bedrock elevations for the proposed Expansion area are provided in **Table 5-1**.

5.4.1.4 Geophysical Horizons

As described within **Appendix J**, natural gamma radiation was completed at three new well locations (MW-14WT, MW-15WT, and MW-17WT) and at seven existing well locations (MW-1, MW-1R, MW-2, MW-5, MW-6, MW-7, and MW-12). Note that geophysics could not be completed at MW-16 due to access issues. Gamma logging was processed and formatted to other software such as gINT and AutoCAD for presentation and data interpretation.

On the gamma logs included in Attachment E of **Appendix J**, the relatively high or low gamma counts produce high or low spikes, which can typically be traced from one log to another by

identifying similar gamma spikes with the context of similar vertical sequences. These laterally traceable spikes are called marker horizons, and in some cases, they may be traced (or correlated) over great distances before they become obscure. Carefully traced marker horizons are believed to closely approximate synchronous lanes within the stratigraphic sequence. Identifying marker horizons across a site can aid in aligning geologic units when boring logs are lacking in detail due to inability to core bedrock or other drilling limitations.

Potentially, a large number of gamma log marker horizons could be selected and correlated. For the purposes of this study, five marker horizons, designated in ascending order as H1 through H5, were identified and illustrated on geologic cross-sections. Given the depth to the regional water table on site and the limited wells available to greater depth, each of the marker horizons were established above an elevation of 1100 feet NAVD. In general, these markers identify spikes or relatively low gamma values (likely coinciding closely to quartz sand or sandstone) or strong shifts in gamma character (which generally coincide with the lithologic changes from sand to shaley or clayey units). However, the magnitudes of the gamma spikes and positions of bulk lithologic changes relative to the gamma markers shift laterally. Therefore, the markers give an indication of the different types of sediments which were deposited during the same interval of time across the site but may have weathered to a saprolite or residuum. In most cases, the marker horizons were able to be correlated to specific rock types or weathered bedrock material.

As stated above, five marker horizons (H1 to H5) were identified across the site. These geophysical horizons are provided on the boring logs within Attachment E of **Appendix J** and on geological cross-sections (**Plan Sheet 12** through **Plan Sheet 22**). Identification of the five marker horizons across the site confirms that the bedrock geology across the site is consistent and predictable and provides correlation between historic boring logs and current boring logs as well as correlation from weathered to unweathered bedrock. Based on the gamma logs, the following observations and conclusions have been made:

- Although regionally the bedrock generally dips to the southwest at 10 feet per mile, the marker horizons indicate a relatively horizontal bedrock structure for the limited extent of the site.
- Marker horizon H1 occurs below the perched water table in sandy dolostone with a lower gamma value above a gamma spike.
- Marker horizon H2 occurs below the perched water table near a contact between sandy dolostone and an overlying dolostone with a lower gamma value above a gamma spike.
- Marker horizon H3 generally occurs just above the perched water table in dolostone with a spike below a lower gamma value.
- Marker horizon H4 occurs above H3 and the perched water table in dolostone, but its lower gamma value between two spikes correlates into saprolite within valleys.
- Marker horizon H5 occurs above H4 and the perched water table in in dolostone, but its low gamma value above a spike correlates into both saprolite and residuum within valleys.

5.4.1.5 Geologic Cross-sections

Eleven geologic cross-sections (Sections A through K) have been created across the landfill property to evaluate the subsurface conditions across the site and within the proposed expansion area. The cross-section location map is included in **Plan Sheet 11**, with geologic cross-sections provided on **Plan Sheet 12** through **Plan Sheet 22**.

5.4.1.5.1 Geologic Cross-section A-A' (Plan Sheet 12)

Geologic Cross-section A-A' (Section A) is drawn north of the existing landfill area and the proposed Expansion area and trends from west to east. Section A shows a bedrock high within the west near boring TB-3, with the bedrock surface decreasing to the east between borings TB-3 and B-17. Another bedrock high is present within the east in the area of TB-4 and well nest MW-3/MW-4P/MW-6. Minor and discontinuous loess deposits and saprolite are present in the areas of borings TB-3 and TB-4.

5.4.1.5.2 Geologic Cross-section B-B' (Plan Sheet 13)

Geologic Cross-section B-B' (Section B) is drawn on the very northern extent of the existing landfill and proposed landfill Expansion area and trends from west to east. Section B shows a bedrock high within the west near boring B-11, with the bedrock surface decreasing to the east between borings B-11 and B-15. Another bedrock high is present within the east near well nest MW-14/MW-14Z. Minor and discontinuous loess deposits are present in the areas of well nests MW-7/MW-8R/MW-9 and MW-14/MW-14Z. Minor and discontinuous saprolite is present in the areas of well nest MW-7/MW-8R/MW-9 and well MW-14WT.

5.4.1.5.3 Geologic Cross-section C-C' (Plan Sheet 14)

Geologic Cross-section C-C' (Section CC) is drawn on the northern portion of the existing landfill and proposed landfill Expansion area and trends from west to east. Section C shows a bedrock high within the west between borings B-9 and B-12. The bedrock surface then decreases slightly to the east between borings B-12 and B-19. Section C shows a bedrock low east of the proposed landfill expansion area near well MW-15WT. Section C shows continuous saprolite from the western edge of the existing landfill through the eastern extent of the cross-section, with significant thickening in the area of well MW-15WT.

5.4.1.5.4 Geologic Cross-section D-D' (Plan Sheet 15)

Geologic Cross-section D-D' (Section D) is drawn within the north-central portion of the existing landfill and proposed landfill Expansion area and trends west to east. Section D shows a bedrock high within the west in the area of borings B-6 and B-5. The bedrock surface then decreases to the east between borings B-5 and TB-7. The bedrock surface is then relatively horizontal between boring TB-7 and well nest MW-5/MW-5A. Section D shows a bedrock low east of the proposed landfill expansion area and well nest MW-5/MW-5A. A minor and discontinuous loess deposit is present in the area of boring TP-11. Section D shows continuous saprolite in the western portion of the cross-section between boring TP-11 and well nest MW-2/MW-2P. Saprolite is also continuous in the area between boring TB-7 through the eastern extent of the cross-section, with thickening east of well nest MW-5/MW-5A.

5.4.1.5.5 Geologic Cross-section E-E' (Plan Sheet 16)

Geologic Cross-section E-E' (Section E) is drawn within the south-central portion of the existing landfill and proposed landfill Expansion area and trends from west to east. Section E shows a bedrock high in the west near boring B-3, with the bedrock surface decreasing to the east. The bedrock surface decreases significantly east of the proposed landfill expansion area and boring B-20. Section E shows continuous saprolite across the cross-section with thickening in the west near boring B-2 and thickening east of the proposed landfill expansion area and boring B-20.

5.4.1.5.6 Geologic Cross-section F-F' (Plan Sheet 17)

Geologic Cross-section F-F' (Section F) is drawn within the southern portion of the existing landfill and proposed landfill Expansion area and trends from west to east. Section F shows a bedrock high in the west near boring TB-12, with the bedrock surface decreasing to the east. The bedrock surface decreases significantly east of boring TB-6. A minor and discontinuous loess deposit and saprolite are present in the area of boring TB-12. Section F shows continuous saprolite in the area between boring TB-6 through the eastern extent of the cross-section with thickening in the east near well nest MW-16WT/MW-16.

5.4.1.5.7 Geologic Cross-section G-G' (Plan Sheet 18)

Geologic Cross-section G-G' (Section G) is drawn south of the existing landfill and proposed landfill Expansion area and trends from west to east. Section G shows an undulating bedrock surface with bedrock highs near well nest MW-1RZ/MW-1PR/MW-1R and well nest MW-10/MW-11/MW-12. Section G shows a continuous loess deposit between well nest MW-1RZ/MW-1PR/MW-1R and well MW-13P and another minor loess deposit within the area of well nest MW-10/MW-11/MW-12. Section G shows continuous and thick saprolite across the cross-section with thickening in the east near well nest MW-10/MW-11/MW-12 and well MW-17WT.

5.4.1.5.8 Geologic Cross-section H-H' (Plan Sheet 19)

Geologic Cross-section H-H' (Section H) is drawn west of the existing landfill and trends from south to north. Section H shows an undulating bedrock surface with a bedrock low in the south near well nest MW-1RZ/MW-1PR/MW-1R and a bedrock high between borings TB-11 and B-5 and at well nest MW-7/MW-8R/MW-9. Minor and discontinuous loess deposits are present within the area of well nest MW-1RZ/MW-1PR/MW-1R and well nest MW-7/MW-8R/MW-9. Section H shows relatively continuous and thick saprolite within the southern portion of the cross-section between well nest MW-1RZ/MW-1PR/MW-1R and boring B-2 with discontinuous saprolite near well nest MW-7/MW-8R/MW-9.

5.4.1.5.9 Geologic Cross-section I-I' (Plan Sheet 20)

Geologic Cross-section I-I' (Section I) is drawn within the central portion of the existing landfill and trends from south to north. Section I shows a bedrock high in the south near well nest MW-1/MW-1P which is followed with a bedrock low immediately to the north near well MW-13P. The central and northern portion of the cross-section between borings TB-6 and B-17 shows a relatively horizontal bedrock surface. A minor and discontinuous loess deposit is present within the area of well MW-13P. Section I shows continuous saprolite throughout the southern and central portion of the cross-section with thickening in the south near well MW-13P and well nest MW-1/MW-1P.

5.4.1.5.10 Geologic Cross-section J-J' (Plan Sheet 21)

Geologic Cross-section J-J' (Section J) is drawn within the central portion of the proposed landfill Expansion area and trends from south to north. Section J shows an undulating bedrock surface with a bedrock low in the south near boring B-21 and a bedrock high in the north between well nest MW-14/MW-14Z and well nest MW-3/MW-4P/MW-6. Minor and discontinuous loess deposits are present within the areas of well nest MW-10/MW-11/MW-12, boring TB-5, and well nest MW-14/MW-14Z. Section J shows continuous saprolite throughout the southern and central portion of the cross-section with thickening in the south near boring B-21 and well nest MW-10/MW-11/MW-12.

5.4.1.5.11 Geologic Cross-section K-K' (Plan Sheet 22)

Geologic Cross-section K-K' (Section K) is drawn east of the proposed landfill Expansion area and trends from south to north. Section K shows an undulating bedrock surface with a bedrock low in the south within the area of well nest MW-16WT/MW-16 and a bedrock high in the north near MW-14WT. Section K shows continuous saprolite throughout the southern and central portion of the cross-section with thickening in the south near well nest MW-16WT/MW-16 and well MW-17WT. Minor and discontinuous saprolite is present in the north near well MW-14WT.

5.4.2 Site Hydrogeology

5.4.2.1 Hydrostratigraphic Units

As described in Section 5.3.5, the deepest on-site borings terminate within the basal member of the Prairie du Chien Group, meaning that the St. Peter-Prairie du Chien-Jordan aquifer is the only hydrogeologic unit being monitored on-site. Shallow groundwater will generally be assessed in reference to water table conditions, and it has been determined that a perched water table and a regional water table exist on-site.

A summary of the wells and their construction that are located within 300 feet of the proposed expansion used for assessing the groundwater conditions is provided in **Table 5-3**.

5.4.2.2 Water Level Measurements

Groundwater elevations measured in the monitoring wells and piezometers across the entire landfill property between 2018 and 2023 are summarized on **Table 5-4**. Following the 2022 well installations, two of the wells (MW-15WT and MW-16WT) installed have remained dry. Because groundwater conditions could not be observed during drilling, determining an appropriate depth of the proposed water table well at the four drilling locations presented a challenge as described further in **Appendix J**. Although dry wells would appear to have limited value for hydrogeologic investigation purposes, the fact the wells are dry has provided essential information to understanding the site hydrogeology particularly in reference to the perched groundwater system. In other words, the dry wells are indicative of a localized diminishing perched groundwater system. As described in subsequent sections, the dry wells have confirmed the following:

- Perched groundwater conditions diminish along the eastern edge of the site and merge with the underlying regional water table system.
- The merging of the perched and regional groundwater systems occurs within saprolite where competent bedrock elevation decreases within valleys.
- Vertical hydraulic gradients in the formation may bias depth to water measurements (water table versus a potentiometric conditions) during the drilling of deeper borings.

Based on water levels provided in **Table 5-4**, recent groundwater elevations within the perched water table are relatively consistent throughout the five-year period but the wells screened within the regional water table indicate the regional water table has risen across the landfill site by approximately 5 to 10 feet over historical averages in recent years with the greatest increase occurring in 2019 with the higher water levels remaining consistent throughout 2020. Decreases between 2021 and 2023 within the regional water table are observed across the site. The increase is consistent with "groundwater flooding" occurring across the state of Wisconsin as described by the WDNR on their website.

It should be noted that many monitoring wells described as monitoring the regional water table have water levels significantly above the screen interval during wet periods. It was determined that these monitoring wells still accurately represent the regional water table, but data and groundwater interpretations should be qualified to address current and future water levels especially if they continue to rise.

Monthly groundwater measurements were recorded between December 2022 and May 2023. In the six sets of monthly readings, groundwater elevations for the landfill property ranged from approximately 1116.64 feet to 1151.19 feet NAVD within the perched water table and ranged from 1072.54 feet to 1094.46 feet NAVD within the regional water table. The difference between high and low levels for monitoring wells across the landfill site during the six-month baseline monitoring period ranged between 0.72 feet to 5.23 feet within the perched water table and ranged between 4.81 to 5.94 within the regional water table. The highest measurements generally occurred during the May 2023 monitoring event, and the lowest during the January 2023 event.

The static water elevation within the perched water table during the May 2023 event in the design limits of the proposed landfill expansion area ranged from approximately 1115 feet to 1145 feet NAVD. The static water elevation within the regional water table during the May 2023 event in the design limits of the proposed landfill expansion area ranged from approximately 1178 feet to 1193 feet NAVD.

Based on the water levels measured in May 2023, depth to water within the proposed Expansion area ranged from approximately 60 to 115 feet bgs.

5.4.2.3 Groundwater Contour Maps

In accordance with NR512.09 Wis. Adm. Code, groundwater contour maps were created to illustrate the highest (May 2023) and lowest (January 2023) groundwater elevations observed between December 2022 and May 2023 using data provided in **Table 5-4**. The groundwater contour maps were generated for the entire monitoring network across the landfill site in order to include the greatest number of data points and assess the local control on groundwater conditions. The high and low groundwater contour maps for the perched water table are illustrated on **Plan Sheet 4** and **Plan Sheet 5**. The high and low groundwater contour maps for the regional water table are illustrated on **Plan Sheet 6** and **Plan Sheet 7**. In addition, an upper and lower potentiometric map were created to evaluate deeper bedrock groundwater flow and are illustrated on **Plan Sheet 8** and **Plan Sheet 9**, respectively.

5.4.2.3.1 Perched Water Table

The high perched water table contour map generated for the May 2023 monitoring event is included on **Plan Sheet 4** with contours established at a 5-foot contour interval. The perched water table surface slopes generally from north to south-southeast across the site. The highest water table elevations are along the northern boundary of the existing landfill and proposed landfill Expansion area. The lowest water table elevations are on the southeastern edge of the proposed landfill expansion area within a bedrock valley.

The low perched water table contour map generated for the January 2023 monitoring event is included on **Plan Sheet 5** with contours established at a 5-foot contour interval. The low perched water table conditions indicate a flow pattern similar to the high perched water table conditions

(**Plan Sheet 4**) with the highest elevations to the north and the lowest elevations to the southeast.

As discussed above, the perched water table flows to the south-southeast and the head loss decreases dramatically within the southeast edge of the proposed landfill Expansion area surrounding MW-16WT and south of MW-15WT. This is due to the bedrock valley within this area causing the perched water table to diminish as it merges with the underlying regional water table. Geologic Cross-Section K-K', which is presented on **Plan Sheet 22**, illustrates this bedrock low and the merging of the perched and regional water table. The merging of the water table within the region of MW-16WT and MW-15WT, also explains why these two perched water table wells are currently dry. The merging of the water tables in this region “drains” the perched water table leaving the groundwater elevations within this area lower than expected. Monitoring well MW-16WT is directly downgradient of the proposed landfill expansion area and although it is dry due to the perched water table not existing within this area, for landfill monitoring purposes its nested monitoring well MW-16 screened withing regional water table system would provide water quality data downgradient of the perched water table system and upgradient of the regional water table system.

5.4.2.3.2 Regional Water Table

The high regional water table contour map generated for the May 2023 monitoring event is included on **Plan Sheet 6** with contours established at a 5-foot contour interval. The regional water table surface slopes generally from south to northeast across the site. The highest water table elevations are along the southeastern edge of the proposed landfill expansion near MW-16WT and southern boundary of the existing landfill. The lowest water table elevations are on the northeastern edge of the proposed landfill expansion area.

The low regional water table contour map generated for the January 2023 monitoring event is included on **Plan Sheet 7** with contours established at a 5-foot contour interval. The low regional water table conditions indicate a flow pattern similar to the high regional water table conditions (**Plan Sheet 6**) with the highest elevations to the south-southeast and the lowest elevations to the northeast.

As discussed above, the regional water table merges with the overlying perched water table at higher elevations within the southeast edge of the proposed landfill expansion area near MW-16.

5.4.2.3.3 Potentiometric Surface

An upper and lower bedrock potentiometric map was also prepared using the data collected for the May 2023 monitoring event and are included on **Plan Sheet 8** and **Plan Sheet 9**, respectively with contours established at a 5-foot contour interval. The potentiometric groundwater conditions indicate a flow pattern similar to the regional water table conditions with the highest elevations to the south and the lowest elevations to the northeast.

5.4.2.4 Flow Net and Geologic Cross-section J-J’

A flow net of the regional water table is presented on geologic cross-section J-J’ (flow net) which trends in the south to north direction throughout the entire proposed landfill expansion area. The location of the flow net cross-section is provided on **Plan Sheet 11** with the flow net included within **Plan Sheet 21**. The purpose of the flow net is to quantifiably illustrate a general flow pattern for the site representing steady groundwater flow. A flow net consists of two sets of lines which must always be orthogonal (perpendicular to each other), flow lines, which show the

direction of groundwater flow, and equipotential lines (lines of constant head), which show the distribution of potential energy.

The flow net was created by applying the following assumptions:

- The regional water table boundary is the upper boundary of an unconfined aquifer and is a line of known and variable head.
- No measurable seepage occurs at the water table given the depth to groundwater, the presence of an intervening perched groundwater system, the barrier provided by landfill development, and the determination that recharge areas locally occur in uplands (Hunt, et a., 2003). Therefore, the water table at this site would largely represent a flow line in which equipotential lines would be perpendicular to the water table.
- The site represents a homogeneous, isotropic system due to its relatively uniform soil classifications and hydraulic conductivity as described in Section 5.4.2.6, 5.4.2.7, and 5.4.2.10; as a result, flow lines and equipotential lines are always perpendicular.
- No impermeable boundaries exist.

Equipotential lines were created by connecting areas of constant head by interpolating between monitoring well points. Due to the vertical exaggeration required to illustrate flow conditions, specific flow net pathways (tubes) were not calculated to scale.

The flow net illustrates equipotential lines ranging across the site from vertical to 80 degrees indicating that groundwater on-site is pre-dominantly horizontal but varies slightly across site with a slight downward gradient.

5.4.2.5 Historical Changes in Water Level in Response to Landfill Operations

Based on the historical water levels recorded since 1988, the groundwater elevations measured in and around the currently permitted Vernon County Landfill have not been affected by landfill operations by any measurable extent. Water level data from 1988 to 2022 is included in water quality information as part of **Appendix Q**. The rise in the regional water table over recent years (**Table 5-4**) is consistent with “groundwater flooding” occurring across the state of Wisconsin as described by the WDNR on their website confirming that the changes in water levels are not in response to landfill development.

5.4.2.6 Horizontal Hydraulic Conductivity

Values of hydraulic conductivity based on the slug tests performed across the landfill property are summarized in **Table 5-5**. The combined historic and new results provide hydraulic conductivity values for the site wells or piezometers. Note that the most recent test data available for each well is presented as the most representative hydraulic conductivity value. Based on the minimum, geometric mean, and maximum values of hydraulic conductivity presented in **Table 5-5**, the hydrogeologic properties for each geologic unit can be described as follows:

- **Loess (0 slug tests):** Groundwater does not occur within loess deposits at the site; no wells are screened in loess and in-field hydraulic conductivity testing cannot be conducted.
- **Residuum (0 slug tests):** Groundwater does not occur within residuum deposits at the site; no wells are screened in residuum and in-field hydraulic conductivity testing cannot be conducted.

- **Saprolite (0 slug tests):** Groundwater generally does not occur within saprolite at the site. Only well MW-16WT is screened in saprolite and this well has been dry since installation and therefore, in-field hydraulic conductivity testing cannot be conducted.
- **Dolostone (24 slug tests):** The hydraulic conductivity of the dolostone varies widely (2.4E-5 cm/sec to 6.7E-2 cm/sec); therefore, the wells have been grouped into perched water table wells, regional water table wells, and piezometers. Hydraulic conductivity values for each zone are as follows:
  - **Perched Water Table Wells:** Values vary widely ranging from 2.43E-5 cm/sec to 1.18E-2 cm/sec, which is reflective of more variable hydraulic conditions. The interbedded nature of the shallower dolostone and sandstone bedrock would provide variable hydraulic conditions depending on the material in the screened interval of each well. Although hydraulic conditions are variable, the hydraulic conductivity testing indicates the formations screened are responding to testing as porous media without turbulent flow.
  - **Regional Water Table Wells:** Values range from 1.86E-4 cm/sec to 6.67E-2 cm/sec with a geometric mean of 1.84E-3 cm/sec, which is reflective of more uniform hydraulic conditions for the uniform bedrock physical properties. The hydraulic conductivity is relatively high but reflective of a uniform porous media.
  - **Piezometers:** Values range from 2.19E-4 cm/sec to 3.07E-2 cm/sec with a geometric mean of 2.01E-3 cm/sec, which is reflective of more uniform hydraulic conditions for uniform bedrock physical properties. The hydraulic conductivity is relatively high and reflective of a uniform porous media.

The horizontal hydraulic conductivity averages cannot be compared to the vertical hydraulic conductivity values described below, due to all groundwater being located within bedrock and representative undisturbed rock core samples could not be collected within the bedrock.

5.4.2.7 Vertical Hydraulic Conductivity

Several samples were analyzed in the laboratory for coefficient of permeability tests during previous investigations and as part of the 2022 investigation which give approximate vertical hydraulic conductivity values. Because all samples were all collected above the perched water table, the values are reflective of unsaturated conditions only. Results of all coefficients of permeability tests are provided on **Table 5-2**. The combined results provide values for assessing vertical hydraulic conductivity values for seven samples associated with loess and residuum deposits. Based on the minimum, geometric mean, and maximum values of hydraulic conductivity presented in **Table 5-2**, the hydrogeologic properties for each geologic unit can be described as follows:

- **Loess (1 Laboratory Result):** The vertical hydraulic conductivity within the one loess sample collected was 2.4E-7 cm/sec which is similar to the underlying residuum.
- **Fine-grained Residuum (4 Laboratory Results):** The vertical hydraulic conductivity of fine-grained residuum samples ranges from 1.1E-6 to 2.3E-8 cm/sec with a geometric mean of 7.0E-8 cm/sec.
- **Coarse-grained Residuum (2 Laboratory Results):** The vertical hydraulic conductivity of the two coarse-grained residuum samples greatly ranges from 1.4E-2 to 3.0E-7 cm/sec with a geometric mean of 6.3E-5 cm/sec. This large range is indicative of layering of the residuum with significant changes in the sand and gravel percentages within the coarse-grained residuum.

Although vertical hydraulic conductivity can vary for the loess, fine-grained residuum, and coarse-grained residuum across the site, the overall hydraulic conductivity is relatively low and uniform with the geometric mean of the loess at 2.4E-7 cm/sec, the fine-grained residuum at 7.0E-8 cm/sec, and the coarse-grained residuum at 6.3E-5 cm/sec. The low hydraulic conductivity of any unconsolidated deposits below the landfill would provide additional protection from landfill development to the underlying groundwater.

5.4.2.8 Horizontal Gradients

Groundwater flow is described in detail under Section 5.4.2.3. Horizontal hydraulic gradients for the perched water table and regional water table were calculated across the landfill property using high water table elevation data (May 2023) and the corresponding water table contour map provided on **Plan Sheet 4** and **Plan Sheet 6**, respectively. The horizontal hydraulic gradient measurements were made perpendicular to the direction of groundwater flow.

The horizontal gradient of the perched water table is reflective of a localized system that is more directly tied to precipitation and localized recharge and better mimics local topography. Within the perched water table, the head loss across the landfill property is approximately 40 feet, with the largest head loss in the southeast near MW-16WT where the perched system diminishes and merges with the underlying regional water table. The horizontal gradient for the perched water table is approximately 0.062 to the south-southeast. The hydraulic gradient within the perched water table directly beneath the proposed landfill expansion area is similar at approximately 0.066 toward the south-southeast.

The horizontal gradient of the regional water table is reflective of a regional groundwater system that intercepts and discharges to nearby surface water features. Within the regional water table, the head loss across the landfill property is approximately 17 feet for a horizontal gradient of approximately 0.020 to the north-northeast with flow toward and discharging to Seas Branch Creek more than 1,700 feet to the north. The hydraulic gradient within the regional water table across the proposed landfill expansion area is approximately 0.026 toward the north-northeast.

5.4.2.9 Vertical Gradients

Vertical gradients were calculated for nested wells and all static water elevation data available from 2018 to 2023. Vertical gradients were calculated by subtracting the head in the deeper well from the head in the shallow well and then dividing by the distance between the midpoint of the monitoring well or piezometer screens. The calculated vertical groundwater gradients are provided in **Table 5-6**.

Three different group of vertical gradients were calculated and are summarized below:

- **Perched Water Table vs Regional Water Table:** The average vertical gradients between the perched and regional water table ranges from 0.774 (MW-1P/MW-1) to 1.045 (MW-1PR/MW-1R) downward. Vertical gradients greater than a value of one (1) are indicative of perched groundwater conditions formed due to the presence of low permeability formations restricting downward groundwater movement.
- **Regional Water Table vs Piezometer:** The average vertical gradient between the regional water table and piezometers ranges from 0.023 (MW-1R/MW-1RZ) to 0.100 (MW-14/MW-14Z) downward.

- **Upper Piezometer vs Lower Piezometer:** The average vertical gradient between the upper and lower piezometers ranges from 0.173 (MW-11/MW-10) to 0.232 (MW-3/MW-6) downward.

5.4.2.10 Groundwater Flow Velocity

The average linear flow velocity of the groundwater is calculated using the equation v = Ki/n, where v = average linear flow velocity, K = hydraulic conductivity, i = hydraulic gradient, and n = effective porosity. Values for each parameter was established as follows:

- Hydraulic conductivity (K) was established from the results presented above. Since the horizontal hydraulic conductivity of the perched water table is variable, a range of K from 2.43E-5 cm/sec to 1.18E-2 cm/sec with a geometric mean of 1.83E-03 cm/sec are used in flow velocity calculations for the perched water table. The regional water table has a more uniform horizontal hydraulic conductivity value; therefore, the geometric mean of the horizontal hydraulic conductivity values of 1.84E-3 cm/sec will be used.
- Hydraulic gradient (i) was established from the results presented above. The average horizontal gradient for the landfill property within the perched water table is 0.062 south-southeast as described in Section 5.4.2.8. The average horizontal gradient for the landfill property within the regional water table is 0.020 north-northeast as described in Section 5.4.2.8.
- Effective porosity (n) was estimated using published documents on the effective porosity of the Prairie du Chein Group (USGS, 1985 and Seaberg, 2000). Effective porosity within the Prairie du Chein is mostly secondary porosity since most flow occurs within dissolution cavities and fractures. It was determined that an effective porosity of 20 percent would be used as a conservative value for the perched water table system as the geology varies with sandier to sandstone units present. For the regional water table system, an effective porosity of 15 percent was used as a conservative value as the geology is more uniform with hard, competent dolostone within this zone.

The horizontal average linear flow velocity across the landfill property (applying the geometric mean for hydraulic conductivity) within the perched water table is approximately 587 feet per year. However, upgradient of the landfill in the vicinity of well MW-9 where the hydraulic conductivity is greater, horizontal flow velocities may exceed 4,000 feet per year. The horizontal average linear flow velocity across the landfill property (applying the geometric mean for hydraulic conductivity) within the regional water table is approximately 248 feet per year.

Note that vertical average linear flow velocity cannot be calculated due to no available vertical hydraulic conductivity values within the bedrock.

Flow velocity can vary locally across the site due to variations in hydraulic conductivity and hydraulic gradients with a downward component of flow. The overall horizontal average linear flow velocity is relatively consistent throughout the year ranging at approximately 587 feet per year toward the south-southeast within the perched water table, but is more uniform at approximately 248 feet per year toward the north-northeast within the regional water table.

5.4.3 Water Quality Assessment

The Vernon County Landfill currently has 26 groundwater monitoring wells or piezometers used to assess groundwater conditions at the site. Following is a summary of the 26 wells currently associated with the MSW landfill (WDNR License No. 3268):

MW-1	MW-1PR	MW-4P	MW-7	MW-11	MW-14Z	MW-16WT*
MW-1R	MW-2	MW-5	MW-8R	MW-12	MW-14WT*	MW-16*
MW-1P	MW-2P	MW-5A	MW-9	MW-13P	MW-15WT*	MW-17WT*
MW-1RZ	MW-3	MW-6	MW-10	MW-14		

Note:
(*) - Installed as part of 2022 investigation.

The groundwater monitoring program is conducted in accordance with the WDNR approved plan modification request (WDNR, February 9, 2021). A copy of the approved environmental monitoring plan for the landfill property is located in **Appendix R**. **Plan Sheet 29** shows the location of each of the monitoring wells and includes a summary of the environmental monitoring requirements. Per the approved monitoring plans, the groundwater wells are sampled semiannually in March and September. Sampling and laboratory analysis are typically conducted by personnel from MSA Professional Services Inc., and laboratory analysis is typically conducted by Eurofins Environmental Testing of University Park, Illinois.

5.4.3.1 Historical Water Quality

With the exception of four Public Health/Public Welfare parameters (iron, fluoride, manganese, nitrate+nitrite), the groundwater quality at Vernon County generally complies with all preventative action limits (PALs) and enforcement standards (ES) set forth in NR140 Wis. Adm. Code. There is currently no evidence that the active MSW Landfill (WDNR License No. 3268) has caused groundwater contamination at the facility.

5.4.3.1.1 Summary of Existing and Proposed Groundwater Quality Exemptions for Existing Wells

As discussed in Section 5.4.3.1, the parameters of iron, fluoride, manganese, and nitrate+nitrite exceed the NR140 Wis. Adm. Code regulatory limits within several wells at Vernon County Landfill. In accordance with NR140.28 Wis Adm. Code, exemptions to select groundwater quality standards have been requested, and approved by the WDNR as part of the 2003 feasibility determination for the last expansion. A summary of the exemptions granted by the WDNR is provided on **Table 5-7**.

Water quality data for existing wells located within 300-feet of the proposed landfill expansion was reviewed for any additional exemptions observed or validated since the 2003 request. One exemption was deemed necessary of nitrate+nitrite at MW-6. Although this parameter was deemed to have “insufficient data” for an exemption at MW-6 within the recent WDNR approved plan modification request (WDNR, February 9, 2021), nine sampling events of nitrate+nitrite are available and all exceed the PAL; therefore, this proposed exemption is warranted. This proposed exemption request is summarized within **Table 5-8**. Tabulated results of historic groundwater analytical data from existing monitoring wells located within 300 feet of the proposed landfill expansion collected through September 2022 are provided in **Appendix Q**.

5.4.3.2 2022 and 2023 Baseline Groundwater Results

Six rounds of monthly baseline groundwater analytical data were collected from the five newly installed groundwater monitoring points (MW-14WT, MW-15WT, MW-16WT, MW-16, and MW-17WT). Note that MW-15WT and MW-16WT were dry during each event and therefore, no groundwater samples could be collected. Groundwater samples collected from these wells were

analyzed for the baseline and detection monitoring parameters summarized on Table 6 within **Appendix J** in accordance with NR507 **Appendix I**, Table 1 and Table 3.

The laboratory analytical results of the baseline groundwater quality monitoring results for the proposed Expansion are provided in Attachment I of **Appendix J**. A summary of the analytical results for the background quality samples collected and analyzed between December 2022 and May 2023 are provided on Table 7 within **Appendix J**. Note that NR140 Wis. Adm. Code groundwater standards are shown on the table and applicable exceedances to the respective ES and/or PAL values have been made evident by underlining or bolding the associated result. Additional monitoring is ongoing to collect sufficient data to present site-specific PALs (for indicator parameters) and/or ACLs (for applicable inorganic parameters). The analytical results for those monitoring events, along with the applicable site-specific PALs and ACLs will be submitted with the Plan of Operation Report.

In accordance with NR507.18(2) Wis. Adm Code, at least four rounds of samples were collected from the baseline wells for the baseline parameters with public health or public welfare standards. A minimum of four additional rounds of samples will be collected from the wells that contained at least two PAL exceedances, or one ES exceedance during the first four rounds of monitoring. The parameters listed below had at least two exceedances of a PAL or one ES exceedance during the baseline monitoring events:

- **Arsenic**: Groundwater from MW-14WT exceeded the PAL (1.0 µg/l) for arsenic during the March 1, 2023, (2.6 µg/l) and March 27, 2023, (1.0 µg/l) sampling events. Arsenic is a common contaminant found in Wisconsin groundwater and the concentration measured in MW-14WT doesn't appear elevated due to any landfill related activities.
- **Manganese:** Groundwater from MW-14WT exceeded the PAL (60 µg/l) or ES (300 µg/l) for manganese during each of the sampling events between December 2023 and May 2023. Manganese is prevalent in groundwater in Wisconsin and is commonly detected in groundwater samples collected from groundwater monitoring wells immediately following their installation. Manganese is often released from soils into groundwater when the soil in contact with groundwater is disturbed, and typically decreases with time.

In accordance with NR507.18(2), a minimum of eight rounds of data will be collected from the above wells for the parameters specified. Depending on the results, ACLs may be proposed for the above parameters and locations in the Plan of Operation Report.

In accordance with NR507.18(3) Wis. Adm Code, at least two rounds of samples were collected from the baseline wells for VOCs. Two additional rounds of VOC data were collected from any well that indicated a valid detection during the first two rounds. Please note that a few VOCs were detected in each of the baseline wells during the December 2022 and January 2023 events but were flagged as the same VOCs were also detected within the trip blanks. Two additional rounds of VOC samples were collected from the baseline wells to confirm the few VOC detections were anomalous. Historic data for wells within 300-feet of the proposed landfill expansion is provided in **Appendix Q**.

Based on the results of baseline and detection monitoring completed for the baseline monitoring wells, exemptions to the groundwater quality standards outlined in NR140.10 and NR140.12 Wis. Adm. Code are requested as outlined on **Table 5-8** and presented in Section 1.3.1.

5.4.4 Subsurface Data Analysis Conclusions

After review of the historic and newly completed subsurface data for the Landfill property the following conclusions can be drawn for the subsurface below the proposed landfill expansion area:

- The uppermost site geologic units have been defined in reference to three primary depositional environments as follows: Unconsolidated deposits including loess and residuum; saprolite; and dolostone bedrock. Geologic units are described as follow:
  - Thickness of loess soils in the vicinity of the proposed landfill expansion area range from 0 to 10 feet with the greatest thickness found along ridges in undeveloped portions of the landfill property.
  - The thickness of the residuum deposits identified in historic borings performed in the vicinity of the proposed landfill Expansion area ranges from approximately 14.0 to 79.5 feet. As described above, the residuum is generally thicker within valleys due to greater weathering occurring as water moves downslope away from more resistant bedrock that forms ridges in the area.
  - Unlike residuum, the saprolite unit still holds the original bedrock structure and is therefore more similar to bedrock than an unconsolidated deposit. As with the residuum, the physical variability of the saprolites is due to layering within the original bedrock prior to weathering.
  - The uppermost bedrock formation in the proximity of the proposed landfill Expansion area has been established as the Ordovician-aged Hager City Member of the Prairie du Chien Group. The Hager City Member is characterized by thin to medium beds of laminated and stromatolitic dolostone with little to no silt or sand (Evans, 2003). The Stockton Hill Member, which is the basal member of the Prairie du Chien Group and is characterized by silty to sandy dolostone and dolomitic sandstone and appears to be encountered on-site as well. As stated previously, all on-site borings terminate within the lower part of the Prairie du Chein Group; based on boring logs from the City of Viroqua municipal wells, the Jordan Sandstone would occur on-site at an elevation of around 1,000 feet NAVD.
- Bedrock coring at the site has resulted in the following observations and conclusions:
  - Dissolution cavities and bedrock fractures associated with dolomitic rock are primarily present above groundwater in bedrock on-site.
  - Dissolution cavities occur primarily as small voids and do not appear to be interconnected.
  - Bedrock, in general, is often highly fractured and the fractures are likely interconnected.
  - Under hydraulic conditions, fractured bedrock above the water table would likely function as a porous media with only localized shale and clay layers providing limitations to the vertical percolation of water.
- Natural gamma radiation geophysics identified five marker horizons (H1 to H5) across the site. Identification of the five marker horizons across the site confirms that the bedrock geology across the site is consistent and predictable and provides correlation between historic boring logs and current boring logs as well as correlation from weathered to unweathered bedrock.

- The St. Peter-Prairie du Chien-Jordan aquifer is the hydrogeologic unit being monitored on-site. Shallow groundwater will generally be assessed in reference to water table conditions, and it has been determined that a perched water table and a regional water table exist on-site. The following has been determined about the groundwater systems on-site:
  - Perched groundwater conditions diminish along the eastern edge of the site and merge with the underlying regional water table system.
  - The merging of the perched and regional groundwater systems occurs within saprolite where competent bedrock elevation decreases within valleys.
  - Vertical hydraulic gradients in the formation may bias depth to water measurements (water table versus a potentiometric conditions) during the drilling of deeper borings.
  - The perched water table, with depth to water ranging from 60 to 115 feet bgs, flows to the south-southeast and the head loss decreases dramatically within the southeast edge of the proposed landfill expansion area surrounding MW-16WT and south of MW-15WT. This is due to the bedrock valley within this area causing the perched water table to diminish as it merges with the underlying regional water table.
  - The regional water table surface slopes generally from south to northeast across the site. The depth to the regional water table ranges from 139 to 172 feet bgs. The regional water table merges with the overlying perched water table at higher elevations within the southeast edge of the proposed landfill Expansion area near MW-16.
  - The potentiometric groundwater conditions indicate a flow pattern similar to the regional water table conditions with the highest elevations to the south and the lowest elevations to the northeast.
- Slug tests were completed across the Landfill Property to aid in historical hydraulic conductivity results.
  - The hydraulic conductivity of the Perched Water Table system varies widely. The interbedded nature of the shallower dolostone and sandstone bedrock would provide variable hydraulic conditions depending on the material in the screened interval of each well. Although hydraulic conditions are variable, the hydraulic conductivity testing indicates the formations screened are responding as porous media without turbulent flow that would be associated with interconnected dissolution cavities or fractures.
  - The hydraulic conductivity of the Regional Water Table and the basal Prairie du Chien (piezometers) are more consistent which is reflective of more uniform hydraulic conditions for the uniform bedrock physical properties. The hydraulic conductivity is relatively high and is reflective of a uniform porous media.
- The vertical hydraulic conductivity can vary for the loess, fine-grained residuum, and coarse-grained residuum across the site, but the overall hydraulic conductivity is relatively low. The low hydraulic conductivity of any unconsolidated deposits below the landfill would provide additional protection from landfill development to the underlying groundwater.
- Flow velocity can vary locally across the site due to variations in hydraulic conductivity and hydraulic gradients with a downward component of flow. The overall horizontal flow velocity is generally consistent throughout the year at approximately 587 feet per year toward the south-southeast within the perched water table but is more uniform at

approximately 248 feet per year toward the north-northeast within the regional water table.

- There is currently no evidence that the active MSW Landfill (WDNR License No. 3268) has caused groundwater contamination at the facility.

6 Waste and Leachate Characteristics {NR 512.12}

This section presents information regarding expected waste types and leachate characteristics in accordance with NR 512.12 Wis. Adm. Code. The Expansion will accept waste from the service area described in Section 2.3 and Section 11. The proposed Expansion will continue to accept the wastes currently approved for the existing landfill. Waste and leachate characterization are discussed in detail in the following sections.

6.1 Waste Characterization

The general waste types anticipated at the proposed Expansion include municipal solid waste from residential, commercial, and industrial sources, C&D waste, and occasional industrial/special wastes. **Table 6-1** summarizes the quantities of each waste type received by WDNR waste category at the existing landfill for the last five years. Of the waste received, on average, approximately 98% consists of MSW (Category 1) and C&D (Category 25) waste (90% MSW, 8% C&D). The remaining 2% consists of publicly owned treatment works (POTW) sludges (Category 5), waste used for ADC (Category 19), and waste generated by a natural disaster (Category 28).

6.1.1 Industrial and Special Waste

6.1.1.1 Industrial Waste

While not a significant source of tonnage, special and industrial wastes are occasionally accepted at the existing landfill and will continue to be accepted during operation of the Expansion. Prior to accepting special or industrial waste, each waste type and generator are thoroughly reviewed in accordance with the approved Special Waste Management Plan to ensure they are appropriate for disposal and will not negatively impact landfill operations. Special waste sources that are not appropriate are rejected as part of the application process and are not received at the facility. This same practice will be followed for the proposed Expansion.

Special and/or industrial wastes that have historically been accepted include those indicated in Section 3.9 used as ADC, and POTW sludges. It is not anticipated that any single stream of special waste or high-volume industrial waste to constitute more than 5% of the design capacity. However, should such a situation occur during the Expansion, the waste would be thoroughly reviewed in accordance with the Special Waste Management Plan and require WDNR approval in accordance with NR 506.09.

6.2 Leachate Characterization and Treatment

6.2.1 Leachate Characterization

Leachate from the proposed Expansion is expected to be similar in composition and strength to leachate from the current landfill due to the similarities in waste composition as described in the previous section. **Table 6-2** summarizes the leachate characterization of the leachate generated

at the landfill over the last five years. Leachate analytical data has been collected since inception of the landfill as part of its ongoing monitoring program.

Recent laboratory test result ranges and summaries from the current leachate testing program (2018-2022) are provided in **Appendix S**.

6.2.2 Leachate Treatment

Currently, leachate collected from the existing landfill is stored in an underground storage tank (UST) and aboveground storage tank, each located at the southwest corner of the landfill. The existing UST can hold up to 15,000 gallons and the AST can hold up to 30,000 gallons. The leachate storage tanks are emptied periodically to maintain at least 4 days of emergency storage in order to prevent a buildup of leachate head on the landfill liner. Hauling trucks pull off the access road onto a leachate loading structure with a concrete spill pad beneath it. Leachate is then pumped from the adjacent tank to the truck and hauled to either the City of Viroqua wastewater treatment plant (WWTP), City of Sparta WWTP, or La Crosse County Landfill.

The Expansion will not require a separate UST or additional leachate loading structure to be installed. The existing leachate loadout, leachate above ground storage tank (AST) and leachate underground storage tank (UST) will have adequate capacity to handle the anticipated worst-case leachate generation rate and maintain a 4-day tank storage capacity in accordance with NR 504.06(5)(o) Wis. Adm. Code. The existing leachate AST has a storage capacity of 30,000 gallons and the leachate UST has a storage capacity of 15,000 gallons, which yields a combined leachate storage capacity of 45,000 gallons. The expected worst-case scenario leachate generation as shown in Section 6.3 is 3.2 gallons per minute, which is an approximate leachate volume of 18,600 gallons during a 4-day time period. Leachate treatment agreements with the City of Viroqua and La Crosse County Landfill are included in **Appendix S**. Vernon County is currently pursuing a formal agreement with the City of Sparta.

6.3 Leachate Generation

The estimated leachate generation rates for the proposed Expansion are summarized in **Table 6-3** for worst case conditions with maximum open areas. The rates are based on an annual infiltration rate of 1-inch for closed areas and 6-inches for open areas in accordance with NR 512.12(3) Wis. Adm. Code. See Section 8.8.1 for further discussion of leachate generation and disposal.

The worst-case scenario anticipates that approximately 9.58 acres will be active, which comprises all proposed Phases VII, VIII and IX and all existing areas of the landfill within the proposed vertical expansion limits. In addition, approximately 5.02 acres will be closed, and accounts for all areas of the existing landfill outside of the proposed vertical expansion limits. The combined leachate generation rate for this scenario is 3.2 gallons per minute or approximately 4,650 gallons per day as shown in **Table 6-3**.

It is anticipated that the landfill during final closure will occupy approximately 14.6 acres and produce 0.8 gallons per minute or 1,087 gallons per day.

7 Constraints on Landfill Development {NR512.13}

7.1 Locational Criteria

In accordance with NR504.04(3) Wis. Adm. Code, no person may establish, construct, operate, maintain, or permit the use of property for a landfill where the limits of filling are or would be within the areas specified, unless an exemption is granted by the WDNR. The following subsections describe the compliance or exemptions needed for NR 504.04(3) locational criteria. **Appendix B** includes correspondence from WDNR regarding locational criteria identified within the ISI and ISR for the proposed expansion.

7.1.1 Lakes, Ponds, or Flowages

The proposed Expansion will not be located within 1,000 feet of a navigable lake, pond, or flowage. One sedimentation basin is located within the proposed Expansion area; however, the rule excludes landfill drainage or sedimentation control structures from the setback requirement. The closest lake, pond, or flowage to the existing landfill and proposed Expansion is the Seas Branch Pond located greater than 4,000-feet to the northeast. According to the WDNR SWDV database, the Seas Branch Pond is an approximate 11-acre flood control impoundment with poor water quality.

7.1.2 Rivers or Streams

The proposed Expansion will not be located within 300 feet of a navigable river or stream. The closest such feature is the Seas Branch Stream located greater than 1,000-feet north of the proposed Expansion. Additionally, an unnamed intermittent stream is located approximately 700-feet to the east of the proposed Expansion. The intermittent stream appears to originate on the landfill property near CTH LF and heads northeast towards the Seas Branch Pond.

7.1.3 Flood Plain

The current landfill and proposed Expansion footprint are not located in a flood hazard area or the 100-year floodplain. The closest floodplain to the existing landfill and proposed Expansion is located greater than 1,200-feet the north in the Seas Branch Valley, which is significantly lower in elevation than the proposed Expansion footprint.

7.1.4 State/Federal Highways, Public Park, and Natural Areas

The proposed waste limits are not within 1,000 feet of the nearest edge of the right-of-way of any state trunk highway, interstate, or federal aid primary highway. The closest such feature is U.S. 14/61 and WI 27, which at its nearest point is roughly 13,000 feet west of the proposed waste limits. There are no public parks or state natural areas within 1,000 feet of the limits of current landfill or Expansion footprint.

7.1.5 Airport Safety

The proposed Expansion is located approximately 2.7 miles (>15,840 feet) northeast of the closest runway at the Viroqua Municipal Airport and is not located in the approach or departure path for the airport. Since the Expansion will be located less than 5 miles from the airport, the County issued a letter dated October 23, 2020, to the FAA notifying them of their intent to

expand. A copy of the notification letter was provided in the ISI request which is included in **Appendix B** to this FR.

The Expansion was determined to be exempt from requirements of 49 USC Section 44718(d), since it does not apply to the expansion or modification of an existing municipal solid waste landfill. For further information see Section 4.6 – Federal Aviation Administration.

7.1.6 Public and Private Wells

There are no public or private wells located within 1,200 feet of the existing or proposed Expansion footprint. The well that serves the landfill office and recycling facility is located greater than 1,200 feet from the proposed Expansion area. The facility well is located roughly 1,550 feet to the southwest, and the closest residential well occurs roughly 1,650 feet to the south. An exemption from NR 50404 (3)(f) was granted within the Feasibility Determination for the previous vertical expansion dated June 28, 2004, to allow the expansion to occur within 1,200 feet of the existing private water-supply well that serves the balefill facility. Since this proposed Expansion area is greater than 1,200 feet from all private water-supply wells an exemption is not required. This existing variance is also outlined within Section 1.3.2 and Section 1.4.

7.1.7 Holocene Era Faults

According to the U.S Geographic Survey (USGS) Earthquake Hazards Program Interactive Fault Map, there are no faults within the vicinity of the active or proposed Expansion footprint. No such faults are known to exist within Vernon County.

7.1.8 Seismic Impact Zones

According to the USGS Earthquake Hazards Program U.S Seismic Hazards Map, the active or proposed Expansion footprint, and most of Wisconsin in general, is located in an area of very low seismic hazard.

7.1.9 Unstable Areas

The are no known current or historic data for the site that would suggest that the current landfill or proposed Expansion is located in an unstable area. Further analyses regarding landfill stability will be performed in the forthcoming Plan of Operation.

7.2 Performance Standards

Under the performance standards in NR 504.04(4), a landfill may not be constructed if there is a reasonable probability that it will cause a detrimental effect on the environment. The following subsections identify the specific detrimental impacts which must be prevented under the performance standards and describe the compliance of the proposed Expansion with these standards.

7.2.1 Impacts to Wetlands

The proposed Expansion is not anticipated to have a significant adverse impact on wetlands. There are no wetlands present in the Expansion area and stormwater run-off during construction and operation will be managed in accordance with applicable stormwater regulations.

The proposed Expansion does involve removal of an existing manmade stormwater sedimentation basin located in the proposed Expansion footprint. The WDNR's ISR opinion indicated that the current zoning would not require special applications or variances to facilitate the landfill Expansion as the entire proposed Expansion footprint is located on Vernon County property and does not require the purchase of agricultural land and will not require an Agricultural Impact Statement.

7.2.2 Endangered and Threatened Species

As indicated in the August 18, 2023 renewed ER review conducted by Laura Spears, it appears unlikely that there would be any significant adverse impact on critical habitat areas or endangered or threatened species as previously discussed in Section 4.5.3.

7.2.3 Detrimental Effects to Surface Water

The proposed Expansion is not anticipated to have a detrimental effect on surface water quality assuming the landfill is designed, constructed, and operated in accordance with State regulations and approvals. Storm water will be managed in accordance with applicable regulations and storm water management systems will be designed and maintained in accordance with industry best management practices. Details of the stormwater management system design are provided in Section 8.16.

7.2.4 Detrimental Effects to Groundwater

The proposed Expansion is not anticipated to cause or exacerbate an attainment or exceedance of a groundwater quality standard assuming the landfill is designed, constructed, and operated in accordance with State regulations and approvals. The Expansion will include a "state of the art" landfill liner and leachate collection system to prevent the release of contamination to the subsurface and groundwater. The existing groundwater quality is discussed in detail in Section 5.4.3.

7.2.5 Migration of Explosive Gas

The proposed Expansion is not expected to cause the migration of explosive gases in excess of 25% of the lower explosive limit (LEL) assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. The Expansion will include a "state of the art" landfill liner and expansion of the landfill gas collection system to minimize the migration of methane to the subsurface. Details of the landfill gas system design are discussed in Section 8.13. Further detail of the LFG extraction system will be provided in the Plan of Operation.

7.2.6 Hazardous Air Emissions

The proposed Expansion is not expected to cause the emission of any hazardous air pollutant (HAP) exceeding the limitations contained in NR 445.07 Wis. Adm. Code assuming the landfill is designed, constructed, and operated in accordance with state regulations and approvals. The Expansion will include a landfill gas collection system, and continued operation of the HHM collection and collection events, to minimize the presence and fugitive emission of HAPs to the atmosphere.

Air emissions will be similar in type to those that are emitted from current operations. Emissions consist of gases or particulate matter generated by decomposition of waste in the landfill,

combustion products from the landfill gas management system, motor vehicles operating on the site, and fugitive dust generated by the wind and vehicle movement.

7.3 Geotechnical Information

This section contains a summary of the geologic, hydrogeologic, topographic and hydrologic characteristics of the proposed Expansion as they relate to the potential for landfill development. The geological setting at the Vernon County Landfill is conducive to the proposed Expansion. The regional geotechnical information is similar throughout the currently permitted site and the proposed expansion.

7.3.1 Geologic

Site geologic conditions which may affect development of the landfill Expansion include the types of soil, the depth to bedrock, type of bedrock, and depth to groundwater. The unconsolidated deposits at the Vernon County Landfill generally consist of loess and residuum deposits overlying dolostone bedrock. In some areas, saprolite (weathered dolostone) separates the unconsolidated deposits from the dolostone bedrock below. Generally, dolostone bedrock is distinguished by refusal during standard penetration testing.

The total thickness of unconsolidated sediments identified within borings completed within 300-feet of the proposed landfill Expansion ranges from approximately 14.0 feet (MW-3/MW-4P/MW-6) to 79.5 feet (MW-10/MW-11/MW-12). The top of saprolite or bedrock is approximately 17 feet below (B-18) to 23 feet below (B-20) the proposed subbase elevations. The variability in unconsolidated soil thickness is a result of the land surface topography and the topography of the upper bedrock surface.

The Vernon County Landfill is in the unglaciated “driftless” zone of southwestern Wisconsin. Loess soils at the Vernon County Landfill vicinity consists of windblown fine-grained sediment deposited during the Late Pleistocene. These deposits are discontinuous at the site. Where present, loess deposits can be generally described as light brown to brown to gray, clayey silt to silty clay to clay with silt (ML to CL). Thickness of loess soils in the vicinity of the proposed landfill Expansion area range from 0 to 10 feet.

Residuum deposits on the landfill site were generated from the weathering of the underlying dolostone bedrock. Although residuum originates from bedrock, the extent of weathering has removed all bedrock structure and it is therefore considered an unconsolidated deposit. The residuum can be generally described as brown to red brown to red, clay (CL) with to trace sand and gravel to clayey sand (SC) with to trace gravel. The thickness of the residuum deposits identified in historic borings performed in the vicinity of the proposed landfill expansion area ranges from approximately 14.0 to 79.5 feet. The distribution of loess and residuum deposits is presented on the site cross-sections (**Plan Sheet 12** through **Plan Sheet 22**).

Saprolite on the landfill site was generated from the weathering of the underlying dolostone bedrock. Unlike residuum, the saprolite unit still holds the original bedrock structure and is therefore similar to a weathered bedrock. The saprolite can be generally described as weathered dolostone to weathered dolostone with silty sand to weathered dolostone with clay.

The uppermost bedrock formation in the proximity of the proposed landfill Expansion area has been designated as the Ordovician-aged Hager City Member of the Prairie du Chien Group. The saprolite and dolostone bedrock surface elevation encountered within the footprint of the

proposed landfill expansion area had elevations ranging from approximately 1221.0 (B-18) to 1195.0 (B-20) feet NAVD. The top of the saprolite and dolostone bedrock is currently approximately 17 feet below (B-18) to 23 feet below (B-20) the proposed subbase elevations. A bedrock surface map, including saprolite, for the entire landfill property is provided on **Plan Sheet 10**.

The bedrock surface in the area of the proposed landfill Expansion generally follows the topography. The site is located on a dolostone ridge that is oriented in the northeast to southwest direction. The bedrock consists of dolostone with small vugs, silty and sandy dolostone, and dolomitic sandstone. As discussed above, a greater than 10-foot separation distance between the bottom of the landfill clay liner and the top of bedrock surface exists within the proposed expansion area.

7.3.2 Hydrogeologic

Site hydrogeologic conditions which may affect development of the landfill Expansion include the depth to groundwater. The aquifer present beneath the proposed landfill Expansion area is the St. Peter-Prairie du Chien-Jordan aquifer. Shallow groundwater will generally be assessed in reference to water table conditions, and it has been determined that a perched water table and a regional water table exist on-site. Based on the water levels measured in May 2023, depth to water within the proposed Expansion area ranged from approximately 60 to 115 feet bgs. Shallow groundwater is found within the perched water table on-site which has groundwater flow to the south to southeast. The groundwater flow within the regional water table is to the north to northeast.

The proposed subbase grade for the proposed Expansion is much greater than 10-feet above the seasonal high groundwater elevation for the perched water table and regional water table. Since the landfill base is above the groundwater surface, the potential for hydrostatic uplift on the composite landfill liner does not exist.

The on-site private water supply well (P-1) for the current balefill facility is located greater than 1,200 feet from the proposed expansion area. One private well (P-2) is also located south of the landfill property and is also greater than 1,200 feet of the proposed Expansion area Both private water supply wells are sampled semi-annually as described within the Environmental Monitoring and Maintenance Plan (**Appendix R**). No landfill-related impacts have been found within either private well.

7.3.3 Topographic

The vicinity of the proposed landfill Expansion is located in an unglaciated portion of Wisconsin known as the “Driftless Area.” Topography within this area is typified by systems of bedrock ridges cut by stream and river valleys. A system of bluffs forms the higher elevations generally through the central portion of the site. The proposed horizontal expansion area is along the top of this bluff system. The subsurface geology consists of silty loess as well as clay soils generated from weathering of dolomite bedrock (ridges) along with alluvium and lake deposits in the river and stream valleys. Unconsolidated deposits are of varying thickness depending on location. Ordovician aged dolomites of the Prairie du Chien group underlie the unconsolidated deposits and Cambrian age sandstone underlies the dolomite. Regional groundwater on-site flows immediately to the north to Seas Branch Creek and eventually flows to the south-east towards the Kickapoo River located approximately three miles east of the site.

Site topographic features will be affected by the proposed Expansion. The Expansion will be expanding into the wooded area east of the existing landfill. This area is sloped to the southeast ranging in elevation from 1250 ft NAVD 88 on the north side of the expansion area to 1150 NAVD 88 to the east of the expansion area. This area will be cleared and backfilled to the landfill subbase as shown on **Plan Sheet 23, "Phase VII through IX Clay Subbase Grades"**. The uncleared wooded area will be left as-is to provide separation between the landfill and adjacent properties.

7.3.4 Hydrologic

The site is located within the West Fork Kickapoo River Watershed, which is part of the Lower Wisconsin River Drainage Basin with regional surface water eventually draining to the Mississippi River approximately five miles south of Prairie du Chien, Wisconsin (Wojahn, 2019). Surface water in the area drains to the Seas Branch (north of the site) and an unnamed drainage (southeast portion of the site) which both feed into the West Fork of the Kickapoo River. The West Fork of the Kickapoo River flows to the south, meeting the Kickapoo River, and eventually the Wisconsin River. Significant surface water bodies near the site include Seas Branch, and an associated impoundment (5 Reservoir), which is approximately one quarter to one half mile north and northeast of the site respectively, an unnamed discontinuous drainage way flowing through the southeast portion of the site, and the West Fork of the Kickapoo River, which is approximately three miles east of the site. Other than the impoundment of Seas Branch (Reservoir 5), no significant lakes are present in the immediate vicinity of the site. Additional unnamed drainage ways are also present in small valleys and swales throughout the region.

The Wisconsin Wetland Inventory Map does not identify wetlands within the proposed landfill Expansion area. A wetland area is identified on the shorelines of Seas Branch just west of the impoundment area, approximately ½ mile northeast of the site. Six wetland class points too small to delineate are located along the shoreline of Seas Branch to the northwest, north and northeast of the site. Three wetland class points identified as dammed pond are identified on the landfill property to the southeast of the proposed landfill expansion area. No other wetlands were identified in the immediate proximity of the proposed landfill expansion area.

7.3.5 Construction and Operation

No constraints regarding material or support services necessary to construct and operate the proposed Expansion have been identified. Construction and operational support requirements are expected to be similar to the currently permitted landfill. No specialized engineering structures outside of the requirements of NR 500 are anticipated to support landfilling activities.

7.3.6 Construction and Operations Materials

On-site excavation and existing stockpiles will provide sufficient and suitable material for general fill for subgrade and berm construction, rooting zone soil required for the final cover, topsoil, and daily and interim cover soil. Other materials, such as the granular drainage layer material for final cover and stone for the leachate collection system are available locally from commercial sources. The geomembrane and other geosynthetics needed for construction are commercially available.

Clay for liner and cover construction are located in an on-site approved clay borrow source which will require excavation and segregation of soils. A 5-foot-thick clay liner is proposed for the expansion, which exceeds the minimum 4-foot-thick clay liner required in NR504.06(2)(e) Wis. Adm. Code and is similar in design to the original, existing clay composite liner installed at the

Landfill. This design was approved to ensure additional protection to nearby residents and environmental resources. The clay used will consist of clay meeting the requirements of NR 504.06(2)(a). The minimum 2-foot-thick clay capping layer [NR 504.07(4)] of the final cover will consist of clay meeting the same requirements as the liner material.

7.3.7 Support Services

The existing landfill has the facilities, equipment, infrastructure, and personnel power necessary to operate the Expansion effectively and efficiently, and other services provided. Existing infrastructure that will be used for the proposed Expansion includes:

- Landfill scale
- Access roads
- Landfill office and recycling facility
- Public drop off
- Leachate collection, conveyance, and storage infrastructure
- Environmental monitoring network (monitoring wells, gas probes, leachate headwells, lysimeters and side slope riser)
- Storm water management structures

The landfill presently has the employees, via direct employment through Vernon County to operate the Expansion. Presently the solid waste department staff consists of 3 full-time employees and one part-time employee consisting of a Director and operational support staff to address administrative requirements, scale attendance, program administration, environmental monitoring and reporting, facility operations coordination, and planning.

The landfill also utilizes engineering consulting to assist with solid waste design, planning and compliance, and operations and monitoring.

7.3.8 Leachate Collection and Treatment

The Vernon County Landfill has an on-site underground storage tank and above ground storage tank. Leachate generated within the MSW landfill is discharged to these tanks through a lift station at the southeast corner of the existing MSW landfill. The underground storage tank and above ground storage tank is located southwest of the MSW landfill near the leachate loading structure. The leachate loadout pad can handle a 5,000-gallon tanker truck to load leachate and haul to the City of Viroqua WWTP, City of Sparta WWTP, or La Crosse County Landfill. **Appendix S** contains a copy of the current leachate treatment agreements in place.

Additionally, Vernon County disposes of its generated leachate to the La Crosse County Landfill (License No. 3253). The La Crosse County Landfill through its research, development, and demonstration (RD&D) plan is approved to utilize Vernon County Landfill leachate for RD&D liquids application.

7.4 Existing Facility Performance

NR 512.13(4) requires expansions of an existing landfill to include an evaluation of the existing facility's compliance status and performance. As discussed in more detail below, the Vernon County Landfill consistently maintains compliance with all known applicable regulations, orders, and administrative rules.

As part of landfill's conditional plan of operation approval (WDNR, July, 2005) requirements, annual reports are submitted to the WDNR that summarize the facility's operational data and compliance status. In accordance with NR 506.19(1), the landfill issues annually a compliance certification to the WDNR asserting their compliance status with respect to approved plans, WDNR conditions of approval, and applicable solid waste statutory and administrative rules. Copies of WDNR annual tonnage reports for 2016 through 2022 are included in **Appendix E.**

7.4.1 Operational Issues and Remedies

Routine operation issues have occurred at the landfill since issuance of the Plan of Operation. These issues were primarily related to environmental issues or human error. These issues are common to landfills and have been resolved with no known or lasting environmental impacts. Examples of the resolved operational issues and the associated remedies include the following:

- Erosion: strategic location of culverts, berms, and riprap; consistent use of flumes/energy dissipaters in high erosion area; expedited vegetative establishment and aggressive use of erosion blanket.
- Wind-blown waste from high winds: instructed operations staff to collect wind-blown trash; repaired damaged wind screens and fences.
- Leachate side slope seeps: avoid using fine grained soil (<15% by weight passing the P200 sieve) as daily; diverted leachate seeps to the leachate collection system; implemented policies to keep highly impermeable items (plastic film, ag bags) from side slopes; and increased intermediate cover; minimized temporary access roads and landfill access points.

7.4.2 Conclusions

Review of the compliance status and performance of the existing facility indicates that the existing facility is performing well and in consistent compliance with existing permits, approvals, and applicable regulations. The proposed Expansion to the existing landfill has been designed to meet the requirements of NR 500 and the intent of existing solid waste regulations. The site has established procedures, trained personnel, and existing infrastructure to support the Expansion. The design, construction and operation will be similar to the existing landfill, and therefore, the Expansion is anticipated to meet the requirements of the forthcoming permits for the site.

8 Engineering and Design {NR 512.14}

8.1 General

This section presents the preliminary design concepts for the proposed Expansion. The preliminary design conforms to the requirements and standards of NR 504 Wis. Adm. Code, unless otherwise noted. The following sections include a discussion of the specific design concepts proposed. **Plan Sheets 23 through 28, along with details on Plan Sheets 29 through 33**, graphically illustrate the proposed design.

8.2 Design Capacity and Site Life

The proposed Expansion will create an additional 427,355 CY of permitted airspace. It is anticipated that the proposed Expansion will extend the existing facility airspace capacity by 15 years. Site life is discussed below in Section 11.6.

8.3 Site Access and Traffic

Solid waste will be hauled by WDNR licensed vehicles to the landfill via major highways within the service area in accordance with applicable weight restrictions. The current traffic routes being used for the existing facility will be used for the proposed Expansion. A discussion of traffic routes is provided in Section 4.7 Transportation and Access.

8.4 Site Screening

Screening is required by NR 504.04(3)(d) Wis. Adm. Code for sites within 1,000 feet of the nearest right-of-way of any state trunk highway, interstate or federal aid primary highway, public park, or state natural area. No such features are within 1,000-feet of the existing landfill or Expansion, however natural screening is provided by a combination of topography, woodlands, and phased vegetated intermediate and final cover.

8.5 Subbase Design

The proposed subbase grades representing the bottom of the five-foot clay liner are provided on **Plan Sheet 23**. Proposed elevations of the subbase range from approximately 1203 feet in the proposed Phase VII to approximately 1255 feet on the northern limits of Phase IX. Soil excavated in establishing subbase grade will be used in construction of the site (i.e., perimeter berms, daily, intermediate, and final cover, access roads or other features), or stockpiled for later use. The sump invert elevation will be four feet below the leachate collection trench flow line. Sump details are shown on **Detail 1 on Plan Sheet 30**.

The subbase grades are designed to provide a minimum ten feet of separation between the bottom of the clay liner and the seasonal high groundwater condition (see **Plan Sheet 4**) and the bedrock surface map (See **Plan Sheet 10**). Given the hydrogeology of the site, the nearest seasonal high water table elevations are between 60 to 100 feet below the bottom of the proposed Expansion clay liner.

8.5.1 Bedrock Separation

The top of the saprolite and dolostone bedrock is approximately 17 feet below (B-18) to 23 feet below (B-20) the proposed subbase elevations; therefore, a greater than 10-foot separation distance between the bottom of the landfill clay liner and the top of bedrock surface exists within the proposed Expansion area as shown on **Plan Sheet 21**. Boring information demonstrates that materials separating the proposed clay liner from bedrock are soils and weathered bedrock with relatively low hydraulic conductivity. Geotechnical data indicates that in all areas except proximal to MW-14Z at the far north end of the proposed Expansion weathered saprolite with silty sand or clay overlies the bedrock. Overlying the weathered saprolite in all areas beneath the proposed Expansion is loess and residuum. The vertical hydraulic conductivity can vary for the loess, fine-grained residuum, and coarse-grained residuum across the site. The overall hydraulic conductivity of these unconsolidated deposits are relatively low.

If bedrock were encountered during landfill subbase excavation, all bedrock within the 10-foot depth below the clay liner subbase would be excavated and the intermediate space left void by bedrock backfilled with soils or crushed bedrock meeting geotechnical subgrade compaction and grain size design requirements and tested in accordance with NR 516.07 (1m) Wis. Admin. Code.

8.6 Base Grades

The proposed base grades, representing the top of clay liner elevations, are presented on **Plan Sheet 24**. Elevations of the base grades range from approximately 1208 feet to 1260 feet NAVD 88. The interior sidewalls are designed at a maximum three horizontal to one vertical (3H:1V) slope from the landfill base to the top of the berm.

The base grades are designed with an approximate 5 percent slope toward the leachate collection pipe, with the drainage patterns in a herringbone pattern. The proposed design meets the requirements of NR 504.06(2)(d) Wis. Adm. Code specifying a minimum 2% slope of the liner toward the leachate collection lines, and NR 504.06(5)(a) Wis. Adm. Code requirements which limit flow distance across the base liner to not more than 130 feet before entering a perforated leachate pipe. The leachate collection trench is designed to maintain a 5 percent slope. Refer to **Plan Sheet 24** which shows the leachate collection system pipe spacing and base grade slopes.

8.7 Liner System

A composite liner system consisting of a 5-foot-thick compacted clay liner overlain with 60-mil textured HDPE geomembrane will be installed within the entire proposed Expansion area. This composite liner system will function as the primary containment system.

8.7.1 Clay Liner

All clay will be obtained from a pre-approved source meeting NR 504.06(2)(a) Wis. Adm. Code. The clay liner design for the proposed Expansion will meet the material and placement requirements of Wis. Adm. Code NR 504.06(2), as follows:

- Minimum thickness of five feet (5-feet)
- Unified Soil Classification System: Group Symbol CL or CH
- Percent passing the No. 200 sieve: >50%
- Liquid Limit: average 25 or greater with no samples below 20
- Plasticity Index: average 12 or greater with no samples below 10
- Compaction: 95 percent of the Standard Proctor (ASTM D698) or 90 percent of the Modified Proctor (ASTM D1557) maximum dry density
- Moisture content at compaction: wet of optimum moisture content for Standard Proctor or minimum 2% above optimum for Modified Proctor
- Lift Thickness: construct in 6-inch compacted lifts
- Maximum laboratory hydraulic conductivity: $1x10^{-7}$ cm/sec

The final lift of the clay liner will be smooth rolled with a smooth drum roller. All coarse gravel or cobbles larger than two inches in diameter will be removed from the surface prior to placement of the geomembrane.

8.7.2 Geomembrane

High density polyethylene (HDPE) is the resin to be used for the liner geomembrane. The reasons for this selection, as well as the basis for selection in the future, are:

- Compatibility with the MSW and anticipated leachate from the facility.
- Longevity of the materials.

- Experience in the industry from the perspective of manufacture and installation including manufacturing quality control (MQC) and manufacturing quality assurance (MQA).
- Experience in the engineering community from the perspective of construction quality control (CQC) and construction quality assurance (CQA).
- Availability and competitive pricing of the liner.

A 60-mil HDPE geomembrane liner will be placed directly above the 5-foot-thick compacted clay liner. Textured geomembrane will be installed over the entirety of the landfill footprint for added surface interface friction. HDPE flat stock sheet will be installed under the side slope riser pipe base.

Prior to installation of the geomembrane, the surface of the compacted clay liner will be rolled smooth, and free of stones and construction debris which may be damaging to the geomembrane. The clay surface will be sufficiently dry and free of ruts. Depressions and large cracks will be filled with tamped clay or bentonite.

8.8 Leachate Management System

The leachate collection system (LCS) for the horizontal component of the Expansion will include a granular drainage layer placed over the composite liner. The drainage layer directs leachate at an average slope of 5% to the collection trench consisting of a 6-inch diameter perforated HDPE pipe placed in a V-type trench. Maximum flow distance of leachate along base grades to the leachate collection trench is 130 feet. Leachate generated within the vertical Expansion will continue to be controlled by the existing leachate collection system.

The maximum leachate collection pipe length as measured to the toe of the opposite slope from the end of a cleanout in Phases VII to IX is less than 820 feet. The Eastern Expansion does not need to comply with NR504.07(6) Wis. Adm. Code regulations for extended collection lines. The leachate collection trench will route the leachate to an extraction sump constructed at the low point in the base grades. A submersible pump will extract leachate from the sump and discharge it to a double-encased transfer pipe located along the perimeter berm. The transfer pipe will convey leachate to a leachate manhole and then to an existing leachate storage tank on-site. The transfer pipe will be double encased from the point it leaves the leachate extraction manhole to the leachate storage tank. The proposed LCS is shown on **Plan Sheet 24**. Details are provided on **Plan Sheets 30 through 32**.

8.8.1 Leachate Generation, Recirculation and Disposal

Leachate quantities are summarized in **Table 6-3** for open and closed conditions in accordance with the established guidelines in NR 512.12(3)(a) and (b) Wis. Adm. Code. This calculation assumes six inches of leachate generation for open areas and one inch of leachate generation for closed areas with installed final cover. Closure of landfill areas will be phased with landfill construction. See **Plan Sheet 26** for closure phasing. As Phase VII is constructed, Closure C-1 will occur. As cells are developed and final grades are reached, closure will progress from west to east over the existing landfill footprint, and south to north over the proposed Expansion footprint.

The worst-case condition of leachate generation during operation of the Expansion will occur following construction of Phase VII, VIII and IX of the proposed Expansion and prior to completion of final cover construction sequences C-2 and C-3. After construction of Phase IX of the proposed Expansion and prior to closure of areas C-2 and C-3, there will be approximately

5.0 acres of open area and 9.6 acres of closed area. Based upon these conditions, the calculated leachate generation for open and closed conditions is approximately 4,650 gallons per day, in total. Leachate generation after final closure of the existing landfill and proposed Expansion is anticipated to be 1,100 gallons per day.

These open and closed area scenarios and calculations are presented in **Table 6-3**. The actual leachate generation rate during site operations will be dependent on the waste filling rate, intermediate cover placement, the total annual precipitation and evaporation rate, and the waste's moisture holding capacity.

There will be storage on site for the worst-case leachate generation scenario for approximately 9.7 days since there is currently a 15,000-gallon underground storage tank and a 30,000 gallon above ground storage tank. This provides a combined leachate storage capacity of 45,000 gallons, which exceeds the required minimum 4-day leachate storage capacity per NR 504.06(5)(o) Wis. Adm. Code.

A proposed leachate recirculation plan and Organic Stability Plan in accordance with NR 514.07(9) Wis. Adm. Code will be included in the Plan of Operation for the Expansion contingent on the approval of this FR.

8.8.2 Leachate Collection System

The leachate collection system consists of a 1-foot-thick granular drainage layer which directs leachate to a series of leachate collection trenches in accordance with NR 504.06(5)(a) through (i) Wis. Adm. Code. The system is designed to eliminate all vertical liner perforation of the landfill liners. The components of the leachate collection system are described below.

8.8.2.1 Geotextile

Geotextile fabric will be placed above the geomembrane and beneath the granular drainage layer. The geotextile will be sized to meet puncture and loading requirements.

8.8.2.2 Granular Drainage Layer

The granular drainage layer will consist of a minimum 1-foot thickness of material meeting the following specifications:

- Washed aggregate, <5% passing the No. 200 sieve
- Calcareous limestone or dolomite concentration <5%
- Washed granular material with a uniformity coefficient (D60/D10) of less than or equal to 4.0
- Hydraulic conductivity which is greater than or equal to 1 cm/sec (ASTM D5856)
- Sieve analysis (ASTM C136, ASTM C117) of drainage material for the leachate drainage layer shall be as follows:

Sieve Size	Percent Passing
1-inch	100
3/4-inch	95-100
1/2-inch	20-55
3/8-inch	0-15
No. 4	<5
No. 200	<2

Placement of the drainage layer will be performed with low-ground pressure bulldozers. A minimum of 1 foot of drainage layer material will be maintained beneath equipment with a ground pressure of less than 5 psi. A minimum of two feet will be maintained for all other tracked or floatation tire type vehicles. A minimum of three feet will be maintained beneath haul trucks.

8.8.2.3 Collection Trenches

Leachate collection trenches consisting of a HDPE perforated pipe installed in a V-type trench will be constructed in the locations shown on **Plan Sheet 24**. Details of the trench are provided in **Plan Sheet 30**.

In accordance with NR 504.07(6) and NR 504.06(5)(tm), pipe bedding material shall be composed of coarse, uniform gravel with a hydraulic conductivity that is greater than 1 cm/sec. A maximum six inches of pipe bedding material consisting of 1-1/2-inch washed stone material with a uniformity coefficient less than 4 will be placed under the pipe. A non-woven geotextile will be placed beneath the pipe bedding to protect the underlying geomembrane. Pipe diameter, SDR and geotextile sizes will be determined during the Plan of Operation as part of the pipe strength and leachate flow capacity calculations and design.

Cleanouts will be installed on both ends of each pipeline segments. Details of a typical cleanout are shown on **Plan Sheet 30**. The east cleanout located on the east end of the east-west leachate collection trench located along the south end of the existing landfill will be encroached upon by the Expansion construction. The outlet for this cleanout will be extended to a location to the south as shown on **Detail 1 on Plan Sheet 33**.

8.9 Leachate Removal and Transfer System

The leachate removal and transfer system proposed for the Expansion consists of a leachate collection sump, a sideslope riser pipe equipped with a submersible pump, a pump building and secondary containment transfer piping. Leachate will be transferred from the proposed system through the existing lift station and leachate forcemain on-site to existing underground and aboveground storage tanks. An above ground leachate loadout structure is used to load tanker trucks for offsite disposal. The individual components are described below.

8.9.1 Leachate Extraction Sump

Leachate collected in the leachate collection piping of the proposed Eastern Expansion will drain to a sump at the low end of Phase VII as shown on **Plan Sheet 24**. The leachate collection sump will be approximately four feet deep (three feet below the incoming leachate collection pipe). The sump will be filled with bedding material, and the bottom of the sump will be lined with non-woven geotextile to protect the geomembrane. Sump and pump sizing calculations will be provided in the Plan of Operation.

8.9.2 Sideslope Riser Piping and Submersible Pump

Sideslope riser piping consisting of an 18-inch diameter SDR 11 high density polyethylene (HDPE) pipe will be installed at the base of the sump and will extend to the top of the perimeter berm. The piping serves as an access point for the submersible pump. Details of the piping are provided on **Plan Sheet 31**. The pump will be designed to facilitate installation and removal through the inclined riser pipe and is designed to be maneuvered from the top of the riser pipe by lift cables. The pump's normal on-and-off operations will be controlled by a pressure transducer located on the end of the pump.

8.9.3 Leachate Pump Building

A leachate pump building will be installed at the top of the perimeter berm at the sump location. The building will provide an extraction point for maintenance of the pump and sampling of leachate. The pump controls and alarm will be centrally located on a control panel located near the building. An alarm light will be provided to indicate a malfunction of the pump. Manual pump controls for pump testing and sampling will be located at each pump building. All electrical equipment, including the pump, flow meter, transducer, and associated wiring will be intrinsically safe. Locations of the building is shown on **Plan Sheet 24**. Details are provided on **Plan Sheet 32**.

8.10 Leachate Transfer and Storage System

Leachate will be transferred from the leachate extraction building through a double-walled pipeline into a connector leachate manhole through another double-walled pipeline into an existing leachate lift station, which pumps the leachate through a leachate force main to a leachate storage tank, as shown on **Plan Sheet 24**. The proposed leachate transfer pipelines will consist of a HDPE carrier pipe within a HDPE containment pipe. The pipes will be installed in a trench and will be located below the frost line. Pipe SDR and diameters will be determined during the Plan of Operation.

8.10.1 Existing Leachate Lift Station, Forcemain Piping and Storage Tanks

8.10.1.1 Forcemain Piping

The existing leachate force main pipe between the existing lift station and the underground leachate storage tank consists of 4-inch HDPE forcemain within an 8-inch HDPE containment pipe.

8.10.1.2 Lift Station

The lift station is encased in 60-inch-thick clay soils. The existing leachate lift station has two pumps and controls. Leachate is pumped from the lift station wet well manhole to the storage tank until the leachate level drops below 1-foot above the floor of the manhole. If leachate levels reach above the 5-foot level mark, a second alternate pump starts, and runs simultaneously. Similarly, if a problem occurs with one of the pumps while pumping, the other pump will activate. Check valves are in place in the forcemain piping to prevent any back draining of leachate from the storage tank to back into the lift station manhole.

8.10.1.3 Leachate Storage Tanks

The leachate underground storage tank (UST) is a 15,000-gallon double walled fiberglass reinforced plastic (FRP) tank. The tank has two gas vent pipes. The tank is encased in 2-foot

thick compacted clay liner. Leachate is pumped from the UST to the leachate loadout structure. The tank has a high level warning system and interstitial leak detection alarm.

The leachate aboveground storage tank (AST) is a 30,000-gallon double walled steel structure. The tank functions primarily as an auxiliary tank receiving leachate pumped to it from the UST. The tank has a high-level tank alarm, interstitial monitoring probe and intake pump shut off system.

8.10.2 Leachate Loading Structure

The leachate loading system is designed to pump leachate from the leachate storage tanks into a tanker truck. The leachate loading structure consists primarily of 4-in ductile iron (D.I.) forcemain piping, elevated piping stand and footing, concrete slab, catch basin, casting, and PVC drainage piping. A 36-inch diameter catch basin is located underneath the pad to contain any spills or truck overflow conditions.

8.11 Leachate Treatment

Primary leachate treatment will be provided by the City of Sparta WWTP and the La Crosse County Landfill (through their currently approved RD&D Plan). The City of Viroqua WWTP is also capable of treating Vernon County leachate and is currently a tertiary option as Sparta WWTP and La Crosse County Landfill provide the bulk of leachate treatment for Vernon County. The volume of leachate discharged to the treatment facility will be recorded and submitted to the WDNR. Leachate treatment agreements are located in **Appendix S**.

8.12 Leachate Headwells

Leachate head monitoring wells (headwells) will be installed to monitor the hydraulic head of the leachate generated in the Expansion area. Two headwells will be installed on either side of the sump in Phase VII. The proposed locations of the headwells are shown on **Plan Sheet 24**. The proposed headwells will consist of a 4-inch diameter SCH 80 non-perforated PVC pipe with a 10-foot slotted pipe section for the screen. The 4-inch diameter sidewall riser pipe will provide a conduit for standard measurement equipment access. Details of leachate headwell construction are provided on **Plan Sheet 30**.

8.13 Landfill Gas Management System

No landfill gas management system has been installed at the current Vernon County Landfill. SEH submitted the Vernon County Landfill (Lic. #3268) Landfill Gas System Plan Modification on November 4, 2022, for a Passive Landfill Gas Management System with option to convert to an active collection system. This Plan Modification was approved by WDNR on January 30, 2023.

A passive LFG system was proposed for the existing landfill due to the low HAP emission potential of the existing landfill which can primarily be attributed to the small size of the landfill. The WDNR air program recognized in a letter dated November 13, 2015 that the existing landfill is able to meet applicable requirements of NR 445 without installing and operating an active LFG collection system. Additionally, the low LFG generation potential for the existing landfill could limit the ability of a traditional candlestick flare skid to sustain combustion.

However, for the proposed Expansion, it is anticipated an active gas system will be installed in accordance with NR 504.08 Wis. Adm. Code. A detailed design of the LFG extraction system for the proposed Expansion will be provided in the forthcoming Plan of Operation. The LFG design

including the need for treatment devices (i.e., a flare) will be based on anticipated HAP emissions, LFG generation potential, leachate recirculation, and operational considerations such as odor control. The system design may consist of vertical LFG extraction wells, horizontal wells, blower, LFG condensate management structures such as drip legs, header and lateral piping, and potentially a treatment device that will be suited to control anticipated HAP and LFG emissions.

8.14 Final Cover System

A composite final cover system consisting of a grading layer above the final waste grades overlain by a two-foot thick compacted clay capping layer, 40-mil textured LLDPE geomembrane, one-foot sand drainage layer, two-foot-thick rooting zone layer, and six inches of topsoil will be installed over the entire proposed Expansion area. This composite final cover system will function as the primary stormwater infiltration deterrent.

8.14.1 Grading Layer

A minimum one-foot grading layer consisting of compacted on-site borrow soils of USCS SW, SP, SM, SC, or combinations thereof will be proof rolled prior to installation of clay layer materials.

8.14.2 Clay Capping Layer

Clay used in the clay capping layer will be pre-approved meeting NR 504.06(2)(a) Wis. Adm. Code. The compacted clay layer design for the proposed expansion will meet the material and placement requirements of NR504.07(4) Wis. Adm. Code, as follows:

- Minimum thickness of two feet
- Unified Soil Classification System: Group Symbol CL or CH
- Percent passing the No. 200 sieve: >50%
- Liquid Limit: average 25 or greater with no samples below 20
- Plasticity Index: average 12 or greater with no samples below 10
- Compaction: 95 percent of the Standard Proctor (ASTM D698) or 90 percent of the Modified Proctor (ASTM D1557) maximum dry density.
- Moisture content at compaction: wet of optimum moisture content for Standard Proctor or minimum 2% above optimum for Modified Proctor
- Lift Thickness: construct in 6-inch compacted lifts
- Maximum laboratory hydraulic conductivity: $1x10^{-7}$ cm/sec

The final lift of the clay capping layer will be smooth rolled with a smooth drum roller. All coarse gravel or cobbles larger than two inches in diameter will be removed from the surface prior to placement of the geomembrane.

8.14.3 Geomembrane

Linear Low-Density Polyethylene (LLDPE) is the resin to be used for the liner geomembrane. The reasons for this selection, as well as the basis for selection in the future, are:

- Compatibility with the municipal solid waste and anticipated leachate from the facility.
- Longevity of the materials.

- Experience in the industry from the perspective of manufacture and installation including manufacturing quality control (MQC) and manufacturing quality assurance (MQA).
- Experience in the engineering community from the perspective of construction quality control (CQC) and construction quality assurance (CQA).
- Availability and competitive pricing of the liner.

A 40-mil LLDPE geomembrane liner will be placed directly above the 2-foot-thick clay capping layer. Textured geomembrane will be installed over the entirety of the landfill cap for added surface interface friction. Prior to installation of the geomembrane, the surface of the compacted clay capping layer will be rolled smooth, and coarse gravel or cobbles large than 2 inches in diameter will be removed from the surface. The clay surface will be sufficiently dry and free of ruts. Depressions and large cracks will be filled with tamped clay or bentonite.

8.14.4 Sand Drainage Layer

The sand drainage layer will consist of a minimum of one-foot with a minimum hydraulic conductivity of $1x10^{-3}$ cm/sec per NR504.07(6)(a). Final material specification will be presented in the Plan of Operation.

The sand drainage layer will be placed at the base of the slope and pushed upward in one lift by equipment with low ground pressure tracks at a maximum of 5 psi ground pressure to ensure integrity of the underlying geomembrane. Equipment shall operate on a minimum of 1-foot of material. Should haul roads be required for placement, rubber-tired equipment will only be allowed on areas of minimum 3-foot thickness.

Perimeter drainage pipes are proposed at the toe of the slope of the sand drainage layer as required in NR504.07(6)(b) Wis. Adm. Code and are detailed on **Plan Sheet 34**. These perimeter drainage pipes daylight to the surface on 200-ft intervals on center. Riprap will be provided at the outlet of each perimeter drainage pipe to prevent scouring.

8.14.5 Rooting Zone Layer

A rooting zone layer consisting of a minimum 2-foot thick layer of general fill material will be placed over the sand drainage layer in an uncompacted state in accordance with NR504.07(6) Wis. Adm. Code. Rooting zone soil will consist of on-site material if available or commercially provided material at time of construction.

8.14.6 Topsoil

A minimum 6-inch-thick layer of topsoil will be placed uncompacted over the rooting zone layer as required by NR 504.07(7) Wis. Adm. Code. The topsoil will consist of material stripped from on-site stockpiles, borrow areas, and from topsoil stripped during the proposed expansion development.

8.14.7 Vegetation

As required in NR 504.07(8) Wis. Adm. Code, all topsoiled areas will be vegetated using seed mixtures and application rates in accordance with Section 630 of the Wisconsin Department of Transportation Standard Specifications for Road and Bridge Construction (Wis DOT specs).

8.15 Preliminary Material Balance

Liner construction for Phases VII, VIII and IX of the proposed expansion will require approximately 37,810 cubic yards of clay (compacted in-place volume) for a 5-foot liner, which corresponds to the following phase developments:

- Phase VII will require approximately 12,370 cubic yards of clay
- Phase VIII will require approximately 12,730 cubic yards of clay and
- Phase IX will require approximately 12,710 cubic yards of clay

Final closure of the existing and proposed facility will require approximately 48,260 cubic yards of clay (compacted in-place volume) for a 2-foot liner.

- Closure C-1 will require approximately 17,050 cubic yards of clay
- Closure C-2 will require approximately 15,120 cubic yards of clay
- Closure C-3 will require approximately 16,090 cubic yards of clay

Preliminary soils balance volumes are presented in **Table 8-1**. Section 9 provides additional information regarding clay liner borrow sources and field and laboratory investigations in accordance with NR 504.075 Wis. Adm. Code. Soil/aggregate needed for drainage layer materials for the existing and proposed Expansion are available from nearby commercial sources.

8.16 Surface Water Management

The Vernon County Landfill is planning to expand the landfill area to the east, encompassing areas that are currently occupied by mostly woodland, grassy areas and an existing stormwater management basin. The Expansion will require stormwater management controls to provide stormwater treatment to meet the DNR standards associated with NR 151, NR 504.09, and NR 216 Wis. Adm. Code. The sedimentation basin outlets and stormwater collection and conveyance systems will be designed in the Plan of Operation. Sedimentation basin storage design is discussed below.

BMP's and good practices in accordance with Technical Standards 1001 and 1064 will be followed as described below:

- Grading and construction shall be scheduled to minimize soil exposure. Only the areas required for landfill construction, access roads and stormwater management structures will be disturbed. Other areas will remain undisturbed.
- Existing vegetation shall be retained whenever feasible.
- Disturbed areas shall be vegetated and mulched. All disturbed areas such as exterior berms, drainage ditches (where velocities do not exceed the erodible velocity for vegetation) and other areas disturbed will be permanently fertilized, seeded, and mulched.
- Runoff shall be diverted away from disturbed areas and active fill areas. **Plan Sheet 28** shows the stormwater drainage ditches or berms which will divert surface water from the proposed Eastern Expansion area. The diversion structures will be built sequentially as site development occurs. The landfill area currently has containment berms which divert water from the active fill areas.

- Sediment shall be trapped on-site. Surface water runoff from disturbed areas, including access roads, screening berms, borrow areas and exterior landfill berms will be diverted or channeled to the sedimentation basins on the landfill property.
- Runoff control structures shall be inspected and maintained. The operation and maintenance of the surface water management features, which generally include cleaning, repair and/or replacement of stormwater management features, will be conducted on an as-needed basis. Operation and maintenance will be described in more detail in the Plan of Operation.

8.16.1 Diversion Berms

Diversion berms will be incorporated on the final cover system to collect and transfer water to the receiving perimeter ditches. The berm flow lines will intermittently discharge into downslope channels to convey water into the perimeter ditch system. To minimize erosion or scouring, diversion berms will be located and sized to maintain flow rates and velocities to prevent erosion. The diversion berms will be designed to convey the 25-year, time of concentration flow rate. Further diversion berm designs will occur during the Plan of Operation.

8.16.2 Downslope Channels

Downslope channels will collect and convey surface water from diversion berms to the perimeter ditches. These channels will be designed to accommodate 25-year, 24-hour storm events over the specific collection areas and discharge to energy dissipating riprap. Downslope channels will be designed to meet design storm flow rates. The downslope channels will be installed above the final cover to simplify vegetation maintenance. Further downslope channel designs will occur during the Plan of Operation.

8.16.3 Ditches

Ditches will be designed around the perimeter of the landfill and up to the proposed sedimentation basin. Flow will be directed off the slopes to ditches to convey flow to the sedimentation basin in the southeast area of the site. See **Plan Sheet 21** for the proposed storm water management system.

The ditch drainage system will be evaluated and designed for the peak flow rates from a 25-year, time of concentration storm. Velocities for grass-lined ditches will be limited to four feet per second (fps). In areas where velocities exceed four fps, erosion matting, or riprap will be proposed to reinforce the surface and prevent breeches or washouts by reducing velocities. Site infiltration requirements of Ch. NR 151 Wis. Adm. Code for the site will be met using ditching if required to maintain site limits.

8.16.4 Sedimentation Basins

Sedimentation basin storage requirements have been designed for the Expansion. Preliminary pond grading is presented in this report. The outlet design will be finalized in the Plan of Operation. The calculations are presented in **Appendix U**.

The storage volume of the proposed sedimentation basin will provide the required stormwater treatment to meet all applicable standards in NR 504.09, while the facility is exempt from NR 151 requirements per NR 151.121(2)(a), since the post-construction site will have less than 10 percent connected impervious area and less than 1 acre of sumulative impervious surface. The

size of the basin is included on the proposed grading plans on **Plan Sheet 24**. Additional details regarding sedimentation basin sizing is provided in **Appendix U**. The pond sizing was completed to meet the following requirements:

NR 504.09 Standards

1. Settle the 0.015 mm size particles for all storms up to and including the 25-year, 6-hour storm.
2. Calculate the surface area of the sediment basin based the intensity of a 25-year, 6-hour storm event.
3. Principal spillways designed to pass a 25-year, 6-hour time of concentration storm event.
4. Emergency spillways designed to pass the 100-year, 24-hour time of concentration storm event.
5. Design of the dewatering structures for sediment basins shall be dewatered in no less than 3 days.

The watershed for the proposed sedimentation basin consists of only the landfill site, which was delineated based on the completed grading design for the landfill expansion. A HydroCAD version 10.20-3c model was created using the delineated watershed, MSE4 distributions, and Atlas 14 rainfall depths for post-development scenarios.

The post-development model includes the landfill expansion and the land uses associated with the expansion. For the landfill areas a hydrologic soil group of D soils was utilized to account for compaction during construction. The proposed sedimentation basin along with the proposed outlet structures were included in the modeling. The proposed sedimentation basin will utilize a similar outlet structure to that which is in-place in the existing sedimentation basin.

8.17 Site Development and Operations

8.17.1 Development

Upon approval, the proposed Eastern Expansion will be developed and operated in three additional phases, Phase VII, VIII and IX to the east of the currently permitted landfill. Phases will be constructed south to north beginning with Phase VII. Closure area development and leachate generation are discussed in Section 8.8.1.

Prior to reaching final waste grades, areas not receiving wastes for a period of 6 months will be covered with a 12- to 18-inch-thick layer of intermediate cover and topsoil. Each phase will be filled to its approved final waste grades and covered with final cover. Capping is estimated to commence in the phasing shown on **Plan Sheet 25**. Temporary phase delineation berms will be constructed between phases to control surface water run-on into the active areas. Details of the filling plan and site development will be shown in the Plan of Operation.

8.17.2 Operations

Daily operations will be confined to as small a landfill area as possible. Filling will proceed from the low point on the base of each phase. Daily cover consisting of soil or an approved alternate daily cover material will be placed over the waste at the end of each day of operation. Intermediate waste grades and slopes for each phase and cell may vary from the final design waste grades and slopes. Final waste grades will be 5.5 feet below the final cover grades shown on Plan Sheet 26, including the 1-foot sand grading layer.

8.17.2.1 5% Overfill

It is proposed that the intermediate waste grades of outboard slopes may at times be as much as 5% higher than the final waste grades, when compared to the total depth of waste at a given location. Prior to the placement of final cover in a given area, waste grades will be surveyed and regraded as necessary to accommodate placement of the composite cover to permitted 4H:1V final grades. At no time during the life of the landfill will waste volume exceed the permitted capacity of the landfill. This overfill depth will be included in slope stability analyses in the Plan of Operation.

This filling approach provides for more efficient waste placement by allowing for settlement of the waste before final cover construction. If waste can only be placed up to the final waste grades, then settlement that inevitably occurs prior to final cover construction lowers the top-of-waste surface below the approved grades, resulting in lost airspace.

Settlement below approved final grades presents problems with landfill gas collection systems, and final cover increments that are designed based on approved final grades. Additional airspace is lost when filling up to a final cover tie-in that has settled below permitted final grades. Pipe slopes decrease as a landfill settles increasing the likelihood that water will collect in the pipe. These problems can be alleviated by increasing the initial slope and allowing it to settle back to the design grades.

5% overfill waste grades are shown on **Plan Sheet 25**.

8.18 Environmental Monitoring Program

An environmental monitoring program will be implemented during the operation of the proposed expansion. Monitoring point locations are summarized in **Plan Sheet 29**. A copy of the environmental monitoring plan for the entire facility is in **Appendix R**. Components of the monitoring program include groundwater, leachate, landfill gas, and surface water. The program presented in this report is consistent with the existing environmental monitoring program for WDNR License No. 3268 and includes additional monitoring points installed for the proposed expansion. The monitoring program described in the remainder of this section is for the proposed expansion only and does not include the closed demolition landfill. The post-closure monitoring program is anticipated to be similar to the program conducted currently, but possibly at a less frequency than current and/or potential elimination of points that may no longer be needed. The post-closure monitoring program will be determined in cooperation with WDNR at the time of site closure.

8.18.1 Groundwater Monitoring

The existing groundwater monitoring network for WDNR License No. 3268 will be maintained and expanded upon as part of the proposed expansion. Five additional groundwater monitoring wells were installed for the proposed expansion, which included four perched water table monitoring wells and one piezometer. Ten existing monitoring wells and piezometers located within 300-feet of the expansion footprint were utilized to fulfill the requirements of s NR512.09(2) Wis. Adm. Code. One existing perched water table monitoring well (MW-5A), two existing regional water table monitoring wells (MW-5 and MW-14), and one existing piezometer (MW-14Z) will be abandoned during subsequent construction activities. Replacement wells MW-5R, MW-5AR, and MW-14R are proposed to be installed once the existing wells are abandoned. New wells will be added to the existing network.

The groundwater monitoring plan proposed in this section is for detection monitoring during operation of the proposed expansion. The proposed groundwater monitoring wells for the detection monitoring program are listed in **Plan Sheet 29**. Note that no changes to the existing Subtitle D designated wells are requested as part of the proposed expansion but two additional Subtitle D designated wells were installed during 2022 (MW-16WT and MW-17WT).

The detection monitoring parameters to be analyzed semi-annually as per Wis. Adm. Code NR 507.19, **Appendix I**, Tables 1 and 2 are as follows:

- Field temperature
- Field Conductivity (@25^{o}C)
- Field pH
- Color, Odor, and Turbidity
- Groundwater Elevation
- Alkalinity
- Chloride
- Hardness
- Dissolved Iron
- Volatile Organic Compounds (Annually for non-Subtitle D wells)

8.18.1.1 Groundwater Sampling Procedures and Parameters

Groundwater sampling and decontamination procedures will follow the guidelines established by the WDNR in the Groundwater Sampling Desk Reference PUBL-DG-037- 96 (WDNR,1996). Groundwater samples will be collected at the frequency, typically semi-annually, specified by the WDNR in the current plan of operation approval and summarized in **Appendix R**.

VOCs and inorganic parameters will be analyzed by the laboratory in accordance with methods in the latest edition of “Test Methods for Evaluating Solid Waste Physical/Chemical Methods SW-846” (USEPA, 1995) by a Wisconsin Certified laboratory.

To evaluate data quality, one duplicate groundwater sample will typically be collected for each group of 10 samples. These samples will be collected from a well which is downgradient of the facility. Field and trip blanks will be collected/transported during groundwater sampling to evaluate decontamination procedures. The field blank will typically be collected after the sampling of a downgradient well. All samples will be tracked on chain-of-custody forms.

8.18.2 Leachate Monitoring

Monitoring includes analysis of leachate quality, monitoring of leachate head on the liner, and monitoring of leachate volumes managed. Additional monitoring needed for leachate recirculation will be developed during the Plan of Operation.

8.18.2.1 Leachate Sampling Points

The leachate collection system for the proposed Expansion is designed to drain to the south to a leachate collection sump and pump located along the south berm (Plan Sheet 19). The sump will pump leachate to an external leachate header pipe, which will transfer leachate to either an UST or AST. Leachate is currently sampled from the underground storage tank.

8.18.2.2 Leachate Sampling Parameters

The leachate samples obtained semi-annually will be analyzed for the following:

- NR 507 Wis. Adm. Code, **Appendix I**, Table 4 (detection leachate monitoring for all landfills) including parameters listed for municipal solid waste.
- Leachate volume will be tabulated monthly and reported annually.

The existing leachate sampling program for the active landfill will also be continued.

8.18.2.3 Leachate Head Monitoring

Leachate head monitoring is proposed in Phases VII (two wells) of the proposed Expansion. **Plan Sheet 29** shows the location of the existing leachate head monitoring wells, and cleanouts used for leachate head measurements, CO-3S through LCH-6 and proposed leachate head monitoring wells LCH-7 and LCH-8, which will be constructed as shown in detail on **Plan Sheet 30**.

Expansion construction will encroach on two existing headwell risers. Existing headwell LCH-5 and LCH-6 are proposed to be abandoned as part of Expansion construction. CO-9S will be used to measure head in Phase 3 at approximately the same base elevation as LCH-5 replacing LCH-5. Existing leachate headwell LCH-6 is located at a position in Phase 3 that doesn't allow meaningful leachate measurement. Leachate would need to be several feet high above the liner to be detected at this location. It was installed below a temporary confinement berm that was removed as part of a phased construction so no longer is useful. This proposal to use a cleanout for leachate head monitoring is in accordance with precedence set in the Conditional Plan of Operation Approval Modification for the Vernon County Sanitary Balefill Landfill, Town of Viroqua, Vernon County, License No. 3268 plan modification to revise leachate elevation monitoring and update long term care costs for the Vernon County Sanitary Balefill Landfill.

The leachate head in each well will be measured quarterly as part of the routine environmental monitoring program.

8.18.3 Landfill Gas Monitoring and Gas Probes

LFG extraction devices will be monitored monthly, adjusted, and operated in accordance with any air permits that may be required. Monitoring will determine if collection system adjustments are necessary to optimize system performance and maintain compliance with applicable requirements. The LFG extraction system, including well locations and conveyance will be designed and presented as part of the Plan of Operation. A preliminary LFG extraction system layout is shown on **Plan Sheet 27**. Gas probe monitoring will be conducted quarterly at existing and proposed gas monitoring probes located on the perimeter of the site. Each probe will be monitored for percent methane and percent oxygen, field temperature, and atmospheric conditions (barometric pressure/trend). The results will be reported to the WDNR along with the semi-annual groundwater data. The preliminary gas monitoring probe program is shown on **Plan Sheet 29**, and includes the following:

- Construction of new gas probes GP-4
- Monitoring of existing gas probes GP-1, GP-2R and GP-3.

8.18.4 Air Monitoring

The proposed Expansion will be required to obtain a construction permit under s. 285.60(1)(a), Wis. Stats., prior to the beginning of construction. The air construction permit application will be submitted at least six months prior to the estimated date of the start of construction.

The construction permit includes all applicable air requirement including pollutant emissions (i.e., particulate matter, VOCs, CO, SO_2, and NO_x), fugitive dust, hazardous air pollutants, and odors. The construction permit may include emission rate limits, testing requirements, monitoring procedures, recordkeeping, and reporting. The construction permit application will likely be submitted in the Plan of Operation and/or at least six months prior to the start of construction of Phase VII.

8.18.5 Surface Water Monitoring

Stormwater from the proposed Expansion will flow to the proposed sedimentation basin as shown on **Plan Sheet 29**. Each stormwater discharge will be inspected and documented after each major precipitation event resulting in a surface water discharge. The inspection point (Sedimentation Basin) as shown on **Plan Sheet 29**, will include observation and recording of the discharge water for color, odor, turbidity, floating solids, foam, oil sheen and other indicators of potential stormwater contamination. In addition, the surface water management structures (e.g., ditches, inlets, outfalls) will be inspected for erosion, siltation, scouring, etc. These observations will be recorded and submitted with the semi-annual monitoring data.

8.18.6 Well Abandonment

Select groundwater monitoring wells installed within, or near the proposed Expansion footprint will need to be abandoned to facilitate construction. Well abandonment will be completed in accordance with s. NR 141.25 Wis. Adm. Code. Currently, the monitoring wells scheduled to be abandoned include MW-5, MW-5A, MW-14 and MW-14Z, as identified on Plan Sheet 23. Some monitoring points around the periphery of the landfill may need to be extended during construction. The Plan of Operation for the proposed Expansion will present information regarding proposed groundwater monitoring well and gas probe abandonments.

8.18.7 Settlement Monitoring

Settlement monitoring will be conducted annually in closed areas using traditional or GPS based survey equipment. Horizontal and vertical control points on the landfill final cover will be utilized to monitor settlement.

8.19 End Use

Once waste disposal activities cease at this site, there will still be considerable acreage left undeveloped. Because much of the land will be wooded, it would be most suitable for use as a park or natural area. The landfill itself should remain undeveloped, as the side slopes and unstable fill would preclude its use for agriculture or residential construction.

9 Clay Borrow Source {NR 512.15}

The proposed Expansion will be constructed in phases utilizing clay from pre-approved on-site clay borrow sources. Off-site borrow areas will be developed, managed and restored under

separate local and state regulatory requirements, if on-site clay borrow sources prove insufficient. As indicated in the materials balance summary in Section 8.15 and **Table 8-1** sufficient clay material that meets liner requirements in NR504.06(2)(a) Wis. Adm. Code is available on-site for final closure and phase liner construction requirements for the existing permitted and proposed Expansion.

9.1 Clay Borrow Sources

The Vernon County landfill currently has two approved clay borrow sources, which will be designated Clay Borrow A and Clay Borrow B and are located on-site as shown in **Plan Sheet 3**. Clay Borrow A is the original borrow source for the landfill, which was approved with the original Feasibility Study for the site in February 1992. During the feasibility determination for vertical expansion of the existing landfill in June 2004, it appeared that Clay Borrow A contained less clay than had been estimated when the borrow source was approved, therefore, to ensure that an adequate clay volume would be available, Clay Borrow B was investigated and later approved in May 2011. Both clay borrow sources are in accordance with soil borrow source and clay liner requirements specified in NR 504.075 and NR 504.06(2) Wis. Adm. Code.

9.1.1 Clay Borrow A

On October 19, 1989, excavation of 29 test pits were conducted in the proposed clay borrow source area. This area encompasses approximately 25 acres on-site, with a significant portion being located within the existing landfill waste limits. The 29 test pits used to characterize the clay borrow source exceeded the minimum number required by NR 512.15(2)(a) for a 25 acre borrow source (minimum number is 17 test pits). The depths of test pits varied between 5 and 14 feet, with most test pits extending between 8 to 9 feet below existing ground elevation. Each major unit encountered in these test pits was described based on field observations and the results of analyzing samples in the laboratory. Test pit logs are provided in **Appendix T**.

A total of 45 samples from 18 test pits were analyzed for grain size distribution and Atterberg limits. The Proctor method was used to test the relationship between moisture content and dry density on 8 samples (each from a different test pit) and developed 5-point Modified Proctor Curves and falling-head permeability tests. Laboratory sample analysis are provided in **Appendix T**.

Only 4 of the 45 samples submitted for grain size distribution analysis did not meet the requirements in NR 504.06(2)(a) Wis. Adm. Code of having at least 50 percent by weight pass the 200 sieve (average P-200 for all samples is 82.8 percent, and average clay content is 31.3 percent). Three of the four samples that did not meet requirements were collected from the bottom of the test pit, beneath the acceptable clay material. Atterberg limit tests showed that all samples that met the previous NR 504.06(2)(a) requirement, or had greater than 50% percent passing P-200, had a liquid limit greater than 25 percent (average is 55.1 percent) and a plasticity index greater than 12 percent (average is 21.1 percent). This exceeds the requirements in NR 504.06(2)(a) for acceptable clay liner material. Eight samples submitted for Modified Proctor tests indicated maximum dry densities that range between 109 and 118 lbs/ft^3 (average is 114.5 lbs/ft^3) and optimum moisture contents between 13 to 19 percent (average is 16.2 percent). Two samples were selected for falling-head permeability tests from the pool of samples collected for Proctor tests and yielded saturated hydraulic conductivity values between 9.47×10^{-9} and 1.03×10^{-8} cm/sec. These results exceed the minimum hydraulic conductivity specified in NR 504.06(2)(a) 2 Wis. Adm. Code.

The original isopach map showing the thickness of acceptable clay material, indicated that approximately 315,300 cubic yards of clay was available prior to excavation. Since then, numerous construction events have taken place, reducing the amount of remaining acceptable clay present. An updated isopach was developed which estimates that approximately 119,190 cubic yards of acceptable clay is still present in accessible areas of Clay Borrow A.

9.1.2 Clay Borrow B

On December 3, 2004, excavation of 15 test pits were conducted in the proposed clay borrow source area. This area encompasses approximately 11 acres on-site. This borrow source is situated to southwest of the existing landfill along the landfill entrance road from CTH LF. The 15 test pits used to characterize the clay borrow source exceeded the minimum number required by NR 512.15(2)(a) for a 11 acre borrow source (minimum number is 12 test pits). The depths of test pits varied between 2.5 and 9.5 feet, with most test pits extending between 8 to 9 feet below existing ground elevation. Each major unit encountered in these test pits was described based on field observations and the results of analyzing samples in the laboratory. Test pit logs are provided in **Appendix T**.

In accordance with NR 512.15(2)(b) Wis. Adm. Code, two representative samples from each pit were analyzed for grain size distributions and Atterberg limits. A total of 31 samples from 15 test pits were analyzed for grain size distribution and Atterberg limits. Three samples were collected for 5-point modified Proctor tests to test the relationship between moisture content and dry density. Laboratory sample analysis are provided in **Appendix T**.

The geological materials or major soil units encountered in the 15 test pits is the same as what has been found elsewhere onsite during previous soil investigations. The upper 10 feet of subsurface material is loess (windblown deposits of silt and clay) and residuum (ranging from silty clay to clayey sand) that is derived from weathering of the underlying bedrock. Although these fine-grained materials have different geologic origins, each includes clay rich horizons which meet the clay liner requirements defined in NR 504.06 Wis. Adm. Code.

Only 1 sample (S-3 from TP-3) from all 31 samples did not meet the requirements in NR 504.06(2)(a)(1) Wis. Adm. Code of having at least 50 percent by weight pass the 200 sieve (average P-200 for all samples is 91 percent). The one sample that did not meet this requirement was collected from the bottom of the test pit, beneath the acceptable clay material. Atterberg limit tests showed that all 30 samples that met the previous NR 504.06(2)(a)(1) requirement, or had greater than 50% percent passing P-200, had a average liquid limit greater than 25 percent (average is 42 percent), with no values less than 20 percent, and an average plasticity index greater than 12 percent (average is 19.2 percent). However, seven of these samples had plasticity indexes less than 10 percent and therefore do not meet the standards for landfill clay liner material. Three of the seven samples (S-2 / TP-4, S-2/TP-5 and S-2/TP-9) were collected at the bottom of the test pit, beneath the layer of acceptable clay material. Two of the samples came from the same test pit (TP-14), suggesting that none of the material at this location is acceptable for use as clay liner material. The remaining two samples (S-1/TP-8 and S-1/TP-15) are shallow samples collected from above acceptable clay material. Therefore, 23 samples of the 30 samples that met NR 504.06(2)(a)(1) requirements for a minimum 50% by weight passing No. 200 sieve, also met Atterberg limit requirements in accordance with NR 504.06(2)(a)(3) and (4) for acceptable clay liner material. Three samples submitted for Proctor tests (ASTM D1577-78, Method A) indicated maximum dry densities that range between 104 and 113 lbs/ft3 (average is 109 lbs/ft3) and optimum moisture contents between 14 to 19 percent

(average is 16.5 percent). Falling-head permeability tests conducted on these samples yielded saturated hydraulic conductivity values between $1.08x10^{-8}$ and $9.12x10^{-8}$ cm/sec. These results exceed the minimum hydraulic conductivity specified in NR 504.06(2)(a)(2) Wis. Adm. Code.

The original isopach map showing the thickness of acceptable clay material, indicated that approximately 69,750 cubic yards of clay was available prior to excavation. Since then, excavation has occurred in the northern sections of the borrow area, reducing the amount of remaining acceptable clay present. An updated isopach was developed which estimates that approximately 28,580 cubic yards of acceptable clay is still present in accessible areas of Clay Borrow B.

9.1.3 Stockpiling

A methodology for separating acceptable from unacceptable soil material is required in NR 512.15(3)(d) Wis. Adm. Code. During excavation of the borrow source, a qualified technician will be present to supervise the excavation and determine whether to accept or reject the material based on visual inspection based on USCS soil types in the field. Accepted clay material will either stockpiled onsite or used in construction depending future circumstances. Periodically samples will be collected from this stockpile and sent to a laboratory for testing to provide quality control on the visual identification and segregation process. Unacceptable material will be further segregated in either topsoil or common fill stockpiles onsite.

9.1.4 Borrow Site Reclamation

A Vernon County Nonmetallic Mine Reclamation Application Permit will be completed and submitted for approval if it is deemed necessary. All applicable local, state, county and federal permits will also be obtained prior to the initiation of clay mining. Proposed final grades for Clay Borrow A and Clay Borrow B source areas is provided in **Appendix T**, which shows the proposed elevations after the required clay has been excavated.

Each phase of construction will be reclaimed to final grades and cover at the end of each excavation. Reclamation activities will include:

- Grading the limits of the mine area to slopes typically around 4H:1V, but not steeper than 3H:1V.
- Grading the base of the mined area to slopes that vary from 1 to 6%.
- Restoring the topsoil previously removed in an even thickness across the entire mined area.
- Seeding, mulching and fertilizing to vegetate the mined area with native forbs and grasses.
- Cleaning and maintaining the sedimentation basin at the end of each construction phase to assure continued functionality.
- Maintaining a silt fence at least until the disturbed area is revegetated.
- Removing the tracking pad when the final reclamation activities are completed.

To minimize erosion, all existing vegetation will be left intact wherever feasible. After the final grades are achieved at the end of a construction event, the topsoil will be seeded for permanent erosion control. Seeding efforts may include both mulch and/or fertilizer where appropriate. Erosion mats will be used to hold seed and mulch on steep surfaces and to reduce wind erosion

of loose mulch. New slopes will be monitored periodically during the reclamation period to ensure adequate vegetative cover has developed.

9.2 Clay Volume Requirements

As indicated in the materials balance summary in Section 8 and **Table 8-1**, approximately 85,980 cubic yards of clay is needed to complete all phase development liner constructions and final closure of the existing and proposed expansion. Section 8 provides the phased development clay volume requirements for Phase VII, VIII and IX liner construction.

In-situ acceptable clay volumes is estimated to be 119,190 cubic yards for Clay Borrow A and 28,580 cubic yards for Clay Borrow B. This means that there is approximately 147,770 cubic yards of acceptable clay in approved on-site clay borrow sources, which yields an estimated 61,790 cubic yard clay surplus after all projected clay requirements have been satisfied. It is likely that Clay Borrow B is underestimated, since the updated clay borrow isopach extend only to the exterior test pits, whereas the initial excavation limits are significantly larger. Updated clay borrow isopachs are provided in **Appendix T**.

10 Environmental Review {NR 512.16}

In accordance with NR 512.16, the following evaluation summarizes the potential environmental impacts of the proposed Expansion as well as efforts through design and construction to avoid, minimize, or mitigate such impacts.

10.1 Project Summary

10.1.1 General Description

The Vernon County Landfill (WDNR License No. 3268) proposes to expand the existing landfill to continue to provide solid waste disposal services to Vernon County. The proposed Expansion footprint is located within the 250-acre property owned by the County in the Town of Viroqua. The proposed Expansion consists of a contiguous 4.0-acre horizontal expansion to the east of the currently permitted active landfill (WDNR License No. 3268) and a vertical expansion over portions of the currently permitted active landfill. The proposed Expansion will be constructed in three phases (Phase VII, Phase VIII, and Phase IX) and will add approximately 427,355 CY of additional airspace.

On November 17, 2021 Vernon County submitted an Initial Site Report (ISR) to the WDNR for the proposed Expansion (SEH, November 2021). The WDNR ISR response, dated February 15, 2022, indicated the proposed Expansion has potential for development of a solid waste disposal facility. The WDNR ISI and ISR response letters are provided in **Appendix B**.

In accordance with NR 500 Wis. Adm. Code requirements, the proposed Expansion design includes a composite landfill liner, leachate collection system, landfill gas management system, composite final cover system, and surface water management system. Vernon County proposes to utilize approved clay borrow sources on-site for all liner and closure construction. Soil materials will also be obtained from the footprint of the horizontal expansion and off-site commercial sources, as needed.

10.1.2 Purpose and Need

To determine the need for expansion, the waste disposal rates for the service area were calculated based on a per capita method using statewide waste disposal data and applying it to the service area and based on historical tonnage data recorded at the existing landfill. As presented in **Table 11-6**, without the proposed Expansion, the estimated site life and disposal capacity within the service area will be consumed this year (2023) based on per capita disposal rates. Utilizing airspace consumption rates based on historic tonnage data, the existing landfill will reach capacity in 2024, which is likely the more realistic timeframe. Additionally, these disposal rates already reflect the impact of waste reduction and recycling initiatives as they exclude recyclable materials.

While it is likely that other landfills in the region could take Vernon County waste beyond 2024, it would likely result in impacts to those facility's site life assumptions and add additional costs to the service area residents (i.e., Vernon County) due to significant increases in waste hauling distances. As presented on **Table 11-5** and **Table 11-7**, with an approved expansion, the available disposal capacity to the service area will be extended to 2039 when utilizing historic waste disposal rates tracked at the facility or 2030 when utilizing per capita waste disposal rates. In either approach, the additional site life from the proposed Expansion would be less than the 15-year site life limit noted in state statute section 289.29(1)(d).

As shown in **Table 11-8**, the statewide disposal capacity is projected to last approximately 10 years beginning in 2024. With current disposal rates and current available disposal capacity, not including pending landfill expansions, landfill disposal capacity will be reached in Wisconsin during 2034. This indicates not only the need for the proposed Expansion of the Vernon County Landfill but also the need for other landfills to be developed or expanded in Wisconsin.

It is expected that the waste disposal rate at Vernon County Landfill will increase during the next 15 years. As a result, consumption of airspace will increase over time as demonstrated by historic tonnage data since inception of the landfill. The factors that have caused most landfills in Wisconsin to reach capacity sooner than projected during the permitting process are challenging to define. Factors that can increase waste disposal rates include economic trends and local/global population increases. Changes in global recycling markets may cause increased waste disposal rates in the future. Natural or anthropogenic disasters can also significantly increase disposal rates for short periods. In 2018, flooding events contributed to an additional 1,784 tons of non-MSW waste being landfilled in Vernon County than the previous year.

The anticipated site life of the proposed Expansion is calculated by dividing the net landfill air space (430,000 CY) by the annual service area demand, with consideration of service area demand increases. Future service area demand projections are calculated using the average airspace consumption rate observed at the landfill between 2018 and 2022, plus the average annual waste growth rate between 2007 and 2022 of 1.56% (**Table 11-2**). Under this scenario, the proposed Expansion volume and currently existing landfill capacity as of January 1, 2023 is projected to be consumed in early 2039.

The need for the Vernon County Landfill Eastern Expansion is justified based on the projected site life for the Vernon County Landfill, and that landfills in Wisconsin have a limited capacity that will be reached in 2034 should no new landfills be sited, or Expansions permitted. The publicly owned Vernon County Landfill will continue to provide competition to other private municipal solid waste landfills in Wisconsin. Competition ensures Wisconsin residents can access reasonably

priced waste disposal. If public landfills are not allowed to expand, their capacity will eventually be depleted. Reduced competition will allow private landfills to substantially increase their fees for disposal. Competition in a marketplace that has seen numerous mergers is needed to provide efficient, cost-effective, waste disposal. The proposed Expansion will ensure that the landfill continues to provide cost-effective and environmentally conscious waste management services for residents within the service area.

10.1.3 Statutory Authority and Approvals

A list of statutory authorities/approvals required for the proposed Expansion is provided in **Table 10-1**.

Vernon County is pursuing WDNR approval of the FR under NR 512, Wis. Adm. Code. NR 512.06(1) requires a landfill applicant to submit a written request for all applicable local approvals to each affected municipality (as defined under s. 289.01(1)) at least 120 days prior to submitting the FR to the WDNR. Copies of correspondence regarding notification to the affected municipalities are included in **Appendix C**. The affected municipalities include Vernon County and the Town of Viroqua. Vernon County will participate in good-faith negotiations with representatives of the Town of Viroqua to develop a siting agreement. The Town of Viroqua has submitted siting resolutions and negotiations with the Town of Viroqua have commenced.

10.1.4 Exemptions, Zoning Changes and Special Permits

Requested exemptions are listed in Section 1.3. No zoning changes or special permits are anticipated for the proposed Expansion.

10.1.5 Locational Criteria and Performance Standards

10.1.5.1 Locational Criteria

As indicated within the ISR and as described in NR 504.04(3)(a) to (i), Wis. Adm. Code, there are several locational criteria that apply to the proposed Expansion. The proposed limits of filling may not be located within:

a) 1,000 feet of any navigable lake, pond, or flowage. The ISI request states that there is not a navigable lake, pond, or flowage within 1,000 feet of the proposed Expansion. The WDNR indicated that the landfill's existing sedimentation pond, a manmade structure is exempt from this setback requirement on November 1, 2021 in the ISI response letter.

b) 300 feet of any navigable river or stream. The WDNR web-based surface water data viewer map indicates that the proposed Expansion is not within 300 feet of a navigable river or stream.

c) A floodplain. The proposed Expansion is not within a floodplain. The WDNR's web-based surface water data viewer map also indicates this area is not in a floodplain and the closest floodplain, which is the floodplain for Seas Branch is greater than 1,500 feet to the north.

d) 1,000 feet of the nearest edge of the right-of-way of any state trunk highway, interstate or federal aid primary highway or the boundary of any public park or state natural area, unless the landfill is screened. There are no state trunk highways, interstates, or federal aid primary highways within 1,000 feet of the proposed site. U.S. Highway 14/61 and Wisconsin State Highway 27 will be the closest feature and will be over 13,000 feet from

the proposed site. Additionally, no public parks or state natural areas are within 1,000 feet of the limits of the current landfill or Expansion footprint.

e) An area where the design or operation of the landfill would pose a significant bird hazard to aircraft. There are no airport runways within 10,000 feet of the proposed Expansion. The closest runway at the Viroqua Municipal Airport is located approximately 15,840 feet (3.0 miles) southwest of the proposed Expansion. Because the proposed Expansion is within 5 miles of this runway, notification to the FAA was completed. On October 23, 2020, Vernon County issued notification to FAA of their intent to expand their MSW landfill and requested concurrence with the understanding that the landfill is not subject to the requirements of 49 USC Section 44718(d). Additionally, the letter was intended to document the County's compliance with the FAA's compatibility review and conditions specified during the previous expansion notification.

   In a letter dated March 19, 2021 Bobb Beauchamp, Environmental Protection Specialist with the FAA, confirmed that the landfill Expansion is exempt from the requirements of 49 USC Section 44718(d) and encouraged the continued use and implementation of the Plan. The FAA also suggested that the Plan be expanded to include periodic coordination with the Viroqua Municipal Airport to minimize the potential bird hazard to aircraft.

f) 1,200 feet of any public or private water supply well. No public or private wells are located within 1,200 feet of the proposed expansion boundary.

g) 200 feet of a fault that has had displacement in Holocene time. The proposed Expansion is not within 200 feet of a fault that has had displacement since Holocene time.

h) Seismic impact zone. The site is not in a seismic impact zone based on United States Geological Survey (USGS) information.

i) Unstable areas. There is no evidence of unstable conditions at the site based on known current or historical data.

10.1.5.2 Performance Standards

The performance criteria outlined in NR 504.04(4)(c) through (f), Wis. Adm. Code include evaluation of surface water, groundwater, gas migration, and air contaminant impacts.

a) Wetland Areas - No regulated wetlands were identified within the proposed project area at this time.

b) Critical Habitat Areas - Based on a review of the Natural Heritage Inventory by Wastewater Specialist Laura Spears, it appears unlikely that there would be any significant adverse impact on critical habitat areas or endangered or threatened species.

c) Surface Water - Development and operation of the proposed Expansion is not expected to have a significant adverse impact on surface water in accordance with NR 504.04(4)(c). The nearest surface water feature to the site is located more than 1,500 feet from the active MSW landfill footprint and the proposed Expansion footprint. The proposed Expansion will be designed to include a sedimentation/infiltration basin that will limit the release of sediment in accordance with applicable soil erosion and stormwater runoff regulations. There are no direct discharge points to nearby wetlands from the surface water control system.

d) Groundwater Quality - Due to the design criteria required for the proposed landfill Expansion, including an engineered liner/cover and leachate collection, the proposed Expansion should not adversely impact groundwater quality. The existing groundwater quality is discussed in detail in Section 5.4.3.1.

e) LFG Migration - The proposed Expansion will be designed to prevent the migration and concentration of explosive gases above the lower explosive limit in the air and soil within 200 feet of the property or beyond. The composite liner and cover systems provide an impermeable barrier, which will prevent LFG migration into the air beyond the limits of filling. The revised LFG collection system may contain LFG extraction wells, conveyance laterals and header system, and LFG treatment devices. The migration and concentration of explosive gases in the soils will be monitored with gas probes on every side within 150 feet of the limits of filling per NR 507.11 Wis. Adm. Code.

f) Emissions - Air emissions will be similar in type to those that are emitted from current operations. Emissions consist of gases generated by decomposition of waste in the landfill, combustion products from the landfill gas management system, motor vehicles operating on the site, and fugitive dust generated by the wind and vehicle movement. The proposed Expansion is not expected to cause emission of any hazardous air contaminants above the NR 445.03 limitations and will remain in compliance with NR 504.04(4)(f).

10.2 Proposed Physical Changes

10.2.1 Terrestrial Resources

The approximate 4.5-acre horizontal expansion area is currently vegetated, vacant, and undeveloped. The vertical expansion will overlay portions of the eastern slope of the existing MSW landfill. The existing sedimentation pond in the southeast is located in the proposed waste limits of the Expansion and will be relocated further to the east.

From the proposed waste limits, the final cover system will project upward at sideslopes of 4H:1V for vertical elevations starting at 1230 feet on the south side, 1266 feet on the northern side, and a high of 1266 feet and low of 1230 feet on the eastern side to a peak of 1334 feet as shown on **Plan Sheet 26**. The western side will tie into the existing landfill. The anticipated final peak elevation of the proposed expansion is 1334 feet NAVD 88.

Modifications to the existing terrestrial setting will be primarily due to soil removal and backfill and tree removal to prepare the landfill subgrade, waste placement during operations, final cover placement, and construction of stormwater management and perimeter berms and access roads.

Preliminary soil balances are provided in Section 8.15 and **Table 8-1**, namely the required quantity of acceptable clay needed for liner and closure construction. On-site clay borrow sources and estimated quantities are provided in Section 9. Clay soils are anticipated to be completely obtained from on-site sources. Drainage layer material for liner and closure construction, which is estimated at 32,580 cubic yards (sand and rock) will be obtained from an off-site borrow source. Topsoil needed for closure construction, estimated at 13,180 cubic yards, will be provided by scarification of the proposed Expansion limits and an existing on-site borrow source. All on-site borrow sources will be reclaimed after the required soil quantities have been excavated as described in Section 9.1.4.

A net common fill shortage is expected to reach subbase grades and tie into the surrounding existing topography. Approximately 110,000 cubic yards of additional common fill soils may be required. This does not include additional soil demands for daily cover soils, intermediate cover, and closure rooting zone layers. Common fill soils may have to be imported from off-site sources as part of this Expansion.

10.2.2 Aquatic Resources

10.2.2.1 Wetlands

Per the WDNR Surface Water Data Viewer, the nearest wetlands are mapped approximately 1,500-feet north of the Expansion along Seas Branch.

10.2.2.2 Groundwater

The perched water table elevation in the monitoring wells located within 300 feet of the design limits of the proposed Expansion area ranged from approximately 1115 feet to 1145 feet NAVD during the May 2023 event. Based on static water elevations collected during 2022 and 2023, groundwater flow within the perched water table is generally towards the south-southeast, while the groundwater flow within the regional water table is generally towards the north to northeast.

The horizontal gradient of the perched water table across the site is approximately 0.062 to the south-southeast with the hydraulic gradient within the perched water table across the proposed landfill Expansion area at approximately 0.066 toward the south-southeast.

The horizontal gradient of the regional water table across the site is approximately 0.020 to the north-northeast with the hydraulic gradient within the regional water table across the proposed landfill Expansion area at approximately 0.026 toward the north-northeast.

The proposed Expansion will cause a net decrease in site infiltration quantities.

10.2.2.3 Surface Water

Development and operation of the proposed Expansion is not expected to have a significant adverse impact on surface water in accordance with NR 504.04(4)(c). The nearest surface water feature to the site is located more than 1,500 feet from the waste filling limits. The proposed Expansion will be designed to include a sedimentation/infiltration basin that will limit the release of sediment in accordance with applicable soil erosion and stormwater runoff regulations. There are no direct discharge points to nearby wetlands from the surface water control system.

10.2.2.4 Stormwater

Stormwater flow patterns have been previously established for the facility and the proposed Expansion will have minimal impact on existing stormwater patterns. Diversion berms will be designed above the final cover system to collect and convey storm water runoff to downslope channels that into receiving perimeter ditches. Diversion berms concentrate and control flow, and discharge runoff from the landfill quickly. The downslope channels will collect and convey surface water from diversion berms to the perimeter ditches and ultimately to the sedimentation basins. Ditches designed around the perimeter of the landfill will also route stormwater to sedimentation basins. A proposed stormwater sedimentation basin to the southeast of the existing landfill collects stormwater from the perimeter ditch along the landfill and Expansion. As discussed in section 8.16.4 and **Appendix U**, the sedimentation basin is designed to the standards of Wis. Adm. NR 504.09 to meet the volumetric and treatment requirements of the increased drainage area associated with the expansion. Ditches are designed around the perimeter of the landfill and up to respective sedimentation and infiltration basins. Flow will be directed off the final cover slopes to ditching taking flow to the sedimentation basin as shown on **Plan Sheet 28** and Section 8.16.

10.2.3 Buildings, Roads, and Other Structures

No new buildings or structures intended for human occupation are planned as part of the proposed Expansion. The proposed Expansion will include service roads, leachate collection system infrastructure, landfill gas system infrastructure, and sedimentation basins. Additional service roads are proposed along the perimeter of the proposed Expansion to provide access for waste hauling, monitoring, and maintenance of the additional phases.

10.2.4 Emissions and Discharges

Emissions from the site improvements will be from construction and ongoing operations. Due to implementation of best management practices, the design of the proposed Expansion, and the proven commitment by the County to mitigate their impact, the proposed Expansion is not expected to have significant impacts to humans or the environment. The landfill emissions and discharges expected from the proposed Expansion include the following:

Engine Exhaust – Engine exhaust from diesel and gasoline-powered vehicles and equipment will be discharged to the atmosphere. The discharge volume will vary depending on the number of vehicles or equipment pieces in operation at a given time. Vehicle exhaust will be kept to a minimum by maintaining vehicles in good operating condition and minimizing idling time when vehicles or equipment are not in immediate activity. No significant increase in vehicular traffic is expected during landfill operation over that which currently occurs at the existing facility.

Dust – Dust may be generated from the gravel access or haul roads, earthwork activities, and wind blowing across exposed areas. Dust quantity will vary depending on the number of vehicles or equipment in operation, weather conditions, and amount of exposed area. Dust will be controlled by establishment of permanent paved roads and sweeping activities, applying water or commercial dust suppressants to gravel access and haul roads during dry weather conditions, and establishing vegetation on completed, disturbed areas. A Dust Control Plan has been developed for the existing landfill and will be updated for the proposed Expansion, during the Plan of Operation.

Noise – Noise impacts associated with the proposed Expansion will occur from bulldozers, scrapers, and other earth moving equipment during liner and final cover construction. During operation, noise will be generated by waste hauling trucks and landfill equipment. These will occur during the hours of operation and are not expected to increase over existing noise levels in the vicinity of the site. Hours of operation are determined in the host agreement, but presumably will remain unchanged.

Leachate – The proposed Expansion will utilize and expand upon the existing leachate collection system for the active landfill. Leachate produced from precipitation that infiltrates through the waste and impinges through a highly permeable drainage blanket will be collected and conveyed via collection lines which will transmit the flow to a sump at the lowest base elevation of Phase VII. From the sump, the leachate will be pumped via a sideslope riser into a force main to an on-site leachate storage tank. Leachate is then transported to the City of Viroqua wastewater treatment plant or another approved treatment plant. The quality and characteristics of the leachate are expected to remain similar to those of the leachate that is currently being collected and treated. Leachate generation is discussed in Section 6.3 of this FR and existing leachate characteristics are provided in **Table 6-2**.

Landfill Gas – LFG from the decomposition of waste will be generated as part of the proposed Expansion and with current waste filling operations. The chemical characteristics of the LFG are not expected to change. The proposed Expansion includes a final cover system with a gas extraction system. These controls will prevent significant subsurface gas migration. A network of gas monitoring probes has already been installed around portions of the existing landfill to monitor for gas migration, and an additional gas probe is proposed to be installed east of the Expansion footprint to have a complete gas monitoring probe system. The gas collection and control systems will be permitted in accordance with the Title V construction and operating permit requirements.

Odors – The control of odors will be achieved by cover soil placement and by the installation of the above-noted gas collection and control system. Highly putrescible waste will be covered immediately upon placement. An Odor Control Plan is currently in place for the existing landfill and will be updated in the Plan of Operation for the proposed Expansion.

Surface Water Runoff – The proposed Expansion has been designed to maintain a close surface water balance between the existing and post-development conditions. Maximum stormwater discharge will occur under final cover conditions after the landfill has ceased operations. Section 8.16 provides a further discussion on surface water management.

Groundwater – The risk of groundwater contamination will not increase as a result of the proposed Expansion. The potential for contamination from the landfill will be minimized by following NR 500 regulations and design requirement that include the use of a composite liner and cover system, and a leachate collection and management system, and operational best management practices.

10.2.5 Maps and Descriptive Materials

Maps, plans and other descriptive materials that may help clarify the proposed Expansion are presented in the plan set, figures, and appendices listed in the table of contents for this report.

10.3 Existing Environment

10.3.1 Physical Environment

10.3.1.1 Topography

The proposed landfill Expansion is located in an unglaciated portion of Wisconsin known as the “Driftless” region. Topography within this area is typified by systems of bedrock ridges cut by stream and river valleys. The ridge and valley system is present in the immediate vicinity of the site, with elevations ranging from approximately 1040 MSL to 1260 MSL within the site boundaries (USGS Avalanche Quadrangle, 2018). Generally, the lower elevations are present to the north along the Seas Branch Drainage, and to the southeast along an unnamed discontinuous drainage. A system of bluffs forms the higher elevations generally through the central portion of the site. The proposed horizontal expansion area is along the top of this bluff system. Surface water from the site generally flows either to the north toward Seas Branch (recently improved trout stream) or to the southeast (toward the unnamed discontinuous drainage way) and then northeast along this drainage way, which flows into the nearby Seas Branch 5 Reservoir.

Site topographic features will be affected by the proposed Expansion. The Expansion grading plan will occupy a part of a wooded area east of the existing landfill. This area is sloped to the southeast ranging in elevation from 1250-ft NAVD 88 on the north side of the Expansion area to 1150 ft NAVD 88 to the east side of the Expansion area. This area will be cleared and backfilled to the landfill subbase grades. The uncleared wooded area will be left as-is to provide separation between the landfill and adjacent properties.

10.3.1.2 Regional Geology

Based on review of the Web Soil Survey for Vernon County (USDA, accessed July 2023), a large portion of the existing landfill is designated “2050” for “landfill”, indicative of disturbed or developed areas. A soil survey for the landfill property is provided in **Appendix F**. The remaining soil cover within the landfill Expansion area include the following soil types:

- Seaton Silt Loam (115D2), driftless ridge, 12 to 20 percent slopes, moderately eroded.
- Basco Silt Loam (234D2), 12 to 20 percent slopes, moderately eroded.
- Pepin Silt Loam (125D2), 12 to 20 percent slopes, moderately eroded.
- Valton Silt Loam (133C2), 6 to 12 percent slopes, moderately eroded.
- Mt. Carroll Silt Loam (114B2), 2 to 6 percent slopes, moderately eroded.

Unconsolidated deposits in the vicinity of the site generally consist of alluvium in the river and stream channels and terraces deposited during Holocene time. These soils are typically fine grained and range from clays to medium sands (Young, 1973). The project area is situated in the unglaciated driftless zone of southwestern Wisconsin. As a result, unconsolidated materials away from stream channels are generally associated with windblown deposition or mass wasting that occurred during the Late Pleistocene.

Evans (2003) also describes rolling topography along the lower slopes of the Paleozoic bedrock ridges as evidence of the downslope movement of the primarily sandstone and dolostone bedrock due to mass-wasting processes. Colluvium deposits are generated from the weathering and subsequent re-deposition of materials comprising the sandstone and dolostone bluffs in the region. A thin layer of loess (silt) is often found on the surface or buried below colluvium across the region. Residuum deposits are generated from in-place weathering of the sandstone and dolostone bedrock. Thickness of unconsolidated deposits in the vicinity of the site ranges from 0 to 50 feet in upland areas, to over 200 feet in stream valleys (Young, 1973).

The bedrock geology generally consists of Paleozoic sedimentary beds overlying pre-Cambrian basement rock. The Paleozoic rock units generally have a regional dip to the southwest at a rate of approximately 10 feet per mile, which largely parallels the Precambrian surface (Evans, 2003).

The uppermost sedimentary bedrock units in Vernon County within the vicinity of the site consist of Ordovician aged dolostone, sandy dolostone, and dolomitic sandstone of the Oneota and Shakopee Formations (Prairie du Chien Group). The Prairie du Chien Group is underlain by the Cambrian aged sandstone and dolomitic siltstone of the Jordan Formation and St. Lawrence Formation (of the Trempealeau Group), the glauconitic sandstone of the Lone Rock Formation (of the Tunnel City Group), and the quartz sandstone of the Wonewoc Formation (of the Elk Mound Group) (Ostrom, 1981).

Based on regional publications by Young (1992), Hindall and Borman (1974), Young and Borman (1973), the bedrock encountered at Vernon County Landfill is the Prairie du Chien Group. It appears that all on-site borings terminate within the lower part of the Prairie du Chein Group.

Based on boring logs from the City of Viroqua municipal wells, the Jordan Sandstone should occur approximately 250 feet below ground surface on-site.

The Prairie du Chien Group consists of the upper Shakopee Formation and the lower Oneota Formation. The Shakopee Formation is further divided into the Willow River and New Richmond members. The Oneota Formation is further divided into the Hager City and Stockton Hill members. The Stockton Hill Member is the basal member of the Prairie du Chien Group and is characterized by silty to sandy dolostone and dolomitic sandstone. The Hager City Member is characterized by thin to medium beds of laminated and stromatolitic dolostone with little to no silt or sand. The New Richmond Member is characterized by fine-grained, feldspathic quartz sandstone. The Willow River Member is the upper-most member of the Prairie du Chien Group and is characterized by stromatolitic and wavy laminated sandy dolostone.

The Jordan Formation has not been encountered during on-site drilling but underlays the Prairie du Chien Group. The Jordan Formation is characterized by a quartz-rich sandstone with medium to large-scale sets of cross-stratification. The St. Lawerence Formation underlies the Jordan Formation and is characterized by thin-bedded sandy dolomite, dolomitic sandstone, and dolomitic siltstone. The Lone Rock Formation underlays the St. Lawerence Formation and is characterized by thin to medium-bedded, cross-stratified, very fine to fine grained sandstone that is brown to greenish brown in color due to the presence of the green-black mineral, glauconite. The Wonewoc Formation underlies the Lone Rock Formation and is generally comprised of buff to white, fine to medium grained sandstones. The very fine to fine grained quartz sandstones, sandy siltstones, and shales of the Eau Claire Formation underlie the Wonewoc Formation in Vernon County. The Mount Simon Formation is the bottom most Cambrian unit in Vernon County. The formation is largely comprised of medium to coarse grained sandstone containing abundant well-rounded quartz grains (Evans, 2003).

Precambrian igneous and metamorphic basement rock is present below the Paleozoic deposits in Vernon County. These rocks consist of Archean Gneiss and early Proterozoic granite and rhyolite. These rocks originated from Precambrian intrusions and volcanic events, or subsequent metamorphosis of these rocks.

10.3.1.3 Site Geology

The unconsolidated deposits at the Vernon County Landfill consist of loess and residuum deposits overlying dolostone bedrock. In some areas, a saprolite or weathered dolostone separates the unconsolidated deposits from the dolostone bedrock below. Generally, the more competent dolostone bedrock is distinguished by refusal during standard penetration testing.

The total thickness of unconsolidated sediments identified within borings completed within 300-feet of the proposed landfill Expansion ranges from approximately 14.0 feet (MW-3/MW-4P/MW-6) to 79.5 feet (MW-10/MW-11/MW-12). The variability in unconsolidated soil thickness is a result of the land surface topography and the topography of the upper bedrock surface. The distribution of loess and residuum deposits is presented on the site cross-sections (**Plan Sheet 11** through **Plan Sheet 22**).

Loess soils at the Vernon County Landfill vicinity consists of windblown fine-grained sediment deposited during the Late Pleistocene. These deposits are discontinuous at the site. Where present, loess deposits can be generally described as light brown to brown to gray, clayey silt to silty clay to clay with silt (ML to CL). Thickness of loess soils in the vicinity of the proposed landfill Expansion area range from 0 to 10 feet.

Residuum deposits on the landfill site were generated from the weathering of the underlying dolostone bedrock. Although residuum originates from bedrock, the extent of weathering has removed all bedrock structure and it is therefore considered an unconsolidated deposit. The residuum can be generally described as brown to red brown to red, clay (CL) with to trace sand and gravel to clayey sand (SC) with to trace gravel. The thickness of the residuum deposits identified in historic borings performed in the vicinity of the proposed landfill Expansion area ranges from approximately 14.0 to 79.5 feet.

Saprolite on the landfill site was generated from the weathering of the underlying dolostone bedrock. Unlike residuum, the saprolite unit still holds the original bedrock structure and is therefore similar to a weathered bedrock. The saprolite can be generally described as weathered dolostone to weathered dolostone with silty sand to weathered dolostone with clay.

The uppermost bedrock formation in the proximity of the proposed landfill Expansion area has been designated as the Ordovician-aged Hager City Member of the Prairie du Chien Group. The Hager City Member is characterized by thin to medium beds of laminated and stromatolitic dolostone with little to no silt or sand (Evans, 2003). The Stockton Hill Member, which is the basal member of the Prairie du Chien Group and is characterized by silty to sandy dolostone and dolomitic sandstone and appears to be encountered on-site as well.

The saprolite and dolostone bedrock surface elevation encountered within the footprint of the proposed landfill Expansion area had elevations ranging from approximately 1221.0 (B-18) to 1195.0 (B-20) feet NAVD. The top of the saprolite and dolostone bedrock is currently approximately 17 feet below (B-18) to 23 feet below (B-20) the proposed subbase elevations. A bedrock surface map, including saprolite, for the entire landfill property is provided on **Plan Sheet 10**.

10.3.1.4 Surface Water

The site is located within the West Fork Kickapoo River Watershed with regional surface water draining to the Kickapoo River Watershed. Surface water from the northern portion of the site drains to the north to Seas Branch Creek which then flows east towards the west fork of the Kickapoo River. Surface water from the southern portion of the site drains to the to an unnamed tributary which then flows northeast to Seas Branch Creek and then east to the west fork of the Kickapoo River. More regionally surface water drainage is to the southeast towards the Kickapoo River. The West Fork Kickapoo River Watershed is bound to the north by the Coon Creek Watershed and the Middle La Crosse River Watershed, the east by the Bear Creek-Kickapoo River Watershed, the south by the Tainter Creek-Kickapoo River Watershed, and the west by the Bad Axe River Watershed.

Significant surface water bodies or drainage in the vicinity of the site include Seas Branch Creek (approximately 1,500 feet north of the proposed expansion), an unnamed intermittent creek (approximately 750 feet south and southeast of the proposed expansion), and Seas Branch Reservoir (Reservoir 5) (approximately 0.90 miles to the northeast) that is formed due to a wet flood control structure or dam.

The chemical quality of surface water in the Lower Wisconsin River Basin is generally good. The water is generally calcium magnesium bicarbonate type, similar to groundwater. The primary water quality concerns are caused from nonpoint sources of pollution, particularly from agricultural operations, excessive populations of rough fish, and hydrologic modifications of the streams such as damming, straightening, and the ditching, draining, or other alternation of

wetlands. The potential for surface water contamination within the West Fork Kickapoo River Watershed is considered high due to over 50% of the land is used for agriculture (WDNR, 2002)

10.3.1.5 Regional Hydrogeology and Groundwater

Regional hydrogeologic reports recognize six hydrogeologic units in Vernon County within the vicinity of the site: 1) St. Peter-Prairie du Chien-Jordan aquifer, 2) St. Lawerence-Lone Rock confining unit, 3) Wonewoc aquifer, 4) Eau Claire confining unit, 5) Mt. Simon aquifer, and 6) Precambrian confining unit (Young, 1992; Mandle and Kontis, 1992; Olcott, 1992).

The deepest on-site borings terminate within the basal member of the Prairie du Chien Group, meaning that the St. Peter-Prairie du Chien-Jordan aquifer is the only hydrogeologic unit being monitored on-site.

Within Vernon County, the St. Peter-Prairie du Chien-Jordan aquifer is typically the uppermost aquifer but has a limited potential. According to Hindall and Borman (1974), well yields from this formation average less than 15 gallons per minute (gpm). Therefore, this aquifer typically provides sufficient yield for individual domestic wells but not public supply wells. Domestic well logs within the vicinity of the site confirm this with maximum construction depths of 300 feet, which places them within the St. Peter-Prairie du Chien-Jordan aquifer.

The deeper aquifers of the Wonewoc Formation and the Mt. Simon Formation can yield more than 500 gpm and therefore these aquifers are typically used for public supply wells. The closest municipal well (Viroqua's Well No. 5) is located approximately 2.7 miles southwest of the site and draws its water from both the Wonewoc and Mt. Simon aquifers.

In the vicinity of the site, the St. Peter-Prairie du Chien-Jordan aquifer system is typically hydraulically connected to streams because of steep topography within the region. The degree of this connection, however, is affected by the permeability of the deposits comprising the aquifer. The most permeable deposits have the greatest connection to streams, but the connection decreases with decreasing permeability.

Groundwater in the aquifer system moves from recharge areas at or near the outcrop of the aquifer to discharge areas, which is regionally the Kickapoo River and its tributaries. In the vicinity of the Vernon County Landfill and the proposed Expansion, the main discharge area is north of the site at Seas Branch Creek. Regional groundwater in the vicinity of the site flows primarily to the north to northeast, towards Seas Branch Creek.

The majority of the regional groundwater flow within the Cambrian aquifer system occurs within the Mt. Simon aquifer which is generally under a leaky artesian (confined) system and moves toward the Mississippi River, the regional discharge area. Although individual aquifers in the system are separated by confining units that may be much less permeable than the aquifers, some water moves vertically through these confining units. Hydraulic heads in the individual aquifers of the Cambrian aquifer system generally are at successively lower altitudes, which indicated that water moves vertically downward into the aquifer system in most areas (Olcott, 992).

Depth to the water table in the vicinity of the site depends largely on topography and ranges from 0 to almost 200 ft bgs. The extreme depths occur in regions where the water table is near the surface in valleys and is deep below ridges (Young and Borman, 1973

10.3.1.6 Site Hydrogeology

The deepest on-site borings terminate within the basal member of the Prairie du Chien Group, meaning that the St. Peter-Prairie du Chien-Jordan aquifer is the only hydrogeologic unit being monitored on-site. Shallow groundwater will generally be assessed in reference to water table conditions, and it has been determined that a perched water table and a regional water table exist on-site.

With the exception of four Public Health/Public Welfare parameters (iron, fluoride, manganese, nitrate+nitrite), the groundwater quality at Vernon County generally complies with all preventative action limits (PALs) and enforcement standards (ES) set forth in NR 140 Wis. Adm. Code. There is currently no evidence that the active MSW Landfill (WDNR License No. 3268) has caused groundwater contamination at the facility.

The on-site private water supply well (P-1) for the current balefill facility is located greater than 1,200 feet from the proposed expansion area. One private well (P-2) is also located south of the landfill property and is also greater than 1,200 feet of the proposed expansion area. Both private water supply wells are sampled semi-annually as described within the Environmental Monitoring and Maintenance Plan (**Appendix R**). No landfill-related impacts have been found within either private well.

10.3.1.7 Air Quality

The proposed Expansion will create air emissions similar to the emissions presently being released during landfill operations at the landfill. The proposed Expansion is not anticipated to have significant impacts on air quality.

LFG constituents from the existing landfill and operations potentially being emitted to the atmosphere include methane, carbon dioxide and monoxide, sulfur dioxide, nitrogen dioxide, and nonmethane organic compounds (NMOCs). Since the proposed Expansion will permit additional airspace, the landfill will be open approximately until 2039, assuming the proposed landfill expansion occurs in 2024, and more LFG producing waste will be placed. While the total amount of LFG generated will increase, the daily or annual emissions are not anticipated to increase substantially from current emissions since the daily and annual waste placement tonnage is not anticipated to increase significantly during operation. The Organic Stability Plan will be revised for the proposed Expansion during the Plan of Operation to ensure that the facility achieves the objectives of organic stability according to NR 514.07(9)(c) Wis. Adm. Code.

Proper waste placement, compaction and daily covering of solid waste, and efficient operation of the LFG collection system will minimize odors. In the event of an odor complaint, the complaint is logged along with the immediate corrective action taken. An Odor Control Plan is in place at the facility.

Construction activities will create emissions similar to those in the construction industry including highway/municipal construction, gravel pit operations and commercial construction. Dust control methods, and other best management practices outlined in the Dust Control Plan, will be performed as needed.

10.3.1.8 Wetlands

No wetlands are present at the landfill property in the area of the proposed Expansion. All site surface water will be diverted to the proposed stormwater sedimentation basin, and therefore no site surface water will discharge directly into a wetland.

10.3.1.9 Soil Borrow Sources

The soil materials needed to construct the proposed liner and final cover systems will be obtained from both on-site and off-site sources. Clay will be obtained from existing on-site clay borrow sources as described in Section 9. Topsoil will be obtained from scarification of the proposed expansion area and on-site borrow sources. Common fill will partially be obtained from on-site borrow sources but will most likely will require off-site soil sources to reach subbase grades of the proposed Expansion. Granular materials for the leachate drainage system will be obtained from off-site quarries.

10.3.2 Biological Environment

Prior to the arrival of white settlers in the mid-1800s, the dominant vegetation in central Vernon County consisted of oak savanna (bur and white oaks) and prairie (Slota, 1969; Cottam et al., 1965). However, during the late 1800's and early 1900's much of the land near Viroqua was logged for timber or converted to agricultural fields. Although farming has been on the decline in recent years, agricultural fields continue to dominate the landscape near the proposed site. Woodland areas (land reverted from agriculture or never used for that purpose) contain mostly oak trees, although shrubs and transitional growth exist in areas immediately adjacent to fields.

10.3.3 Land Use and Zoning

The Vernon County Landfill property is located within the Town of Viroqua jurisdictional boundary. According to the Town of Viroqua Clerk, the township has adopted a zoning ordinance which is available on their website. Pursuant to Wisconsin Statute s. 289.22 (Local Approval), the Vernon County Solid Waste Department will be issuing a certified letter to the Town of Viroqua requesting they specify all applicable local approvals that are required.

Based on review of the draft ordinance and zoning map, the Vernon County Landfill property is located in a "Special Purpose District". Permitted uses in the special purpose district include the following uses, so long as such sites are secured in a sufficient manner to insure public and environmental safety, including meeting all applicable State or Federal standards and laws: Landfills and former Landfills; Junk Yards; and, chemical, biological, and/or hazardous material production or handling.

Based on review of the Town of Viroqua's zoning ordinance, current zoning will not require special applications or variances to facilitate the landfill Expansion. Since the entire proposed Expansion footprint is located on Vernon County property, and does not require a purchase of agricultural property, an Agricultural Impact Statement will not be required.

As indicated in the WDNR's opinion to the ISI, the proposed Expansion is not located in a floodplain, conservancy, or shore land. As such, zoning ordinances relating to these instances are not applicable.

10.3.4 Socioeconomic Conditions

Vernon County owns approximately 250-acres which fully encompasses the existing landfill and proposed Expansion. No residents will be displaced. Since the current landfill was permitted in 1992, the area in the vicinity of the landfill has seen little development in the surrounding area with a majority of the land remaining for agricultural use.

There are no unique social or economic conditions near the proposed site. As described in the preceding section, land use in this area includes mostly farms and low-density residential development. Consequently, no particular ethnic, cultural, or socio-economic groups exist other than farmers and rural residents, which are not unique to this part of Vernon County.

It is Vernon County's objective to provide cost effective and environmentally sound waste disposal services locally to its residents. In addition to meeting disposal needs of the County, the continued operation of the landfill via Expansion will provide employment opportunities for local residents, contractors, and support local businesses through the purchase of required goods and services.

10.3.5 Other Special Resources

No special resources, including archaeological or historical areas, or prime agricultural land will be impacted by the proposed Expansion. On August 31, 2021 Laura Spears, WDNR Wastewater Specialist, issued a letter summarizing the findings of an endangered resources (ER) and cultural/historic review for the proposed Expansion as part of the ISI request. A copy of the above letter is included in the ISR and provided in **Appendix B** and indicates there are not cultural or historic concerns for this parcel.

10.4 Environmental Consequences

10.4.1 Physical Impacts

Th physical impacts which are summarized in **Table 10-2** include potential impacts associated with expansion of the existing landfill.

10.4.2 Biological Impacts

As referenced in Section 10.3.2, it appears unlikely that the proposed Expansion would result in any significant adverse impact on critical habitat areas or endangered or threatened species. The biological impacts which are summarized in **Table 10-3** include potential impacts associated with Expansion of the existing landfill.

10.4.3 Land Use Impacts

The proposed Expansion footprint is a continuation of an existing landfill operation and is not expected to have an effect on surrounding land use in the immediate vicinity. Most of the surrounding land is used for agricultural or low-density residential development, much as it was before the existing landfill opened, and therefore there is no reason to expect that this would change if the horizontal and vertical expansion was built. Additionally, the property is currently zoned for landfill use within the Town of Viroqua zoning ordinance.

10.4.4 Socioeconomic Impacts

There are no unique ethnic, cultural, or socioeconomic groups in this area that would be affected by the proposed horizontal and vertical expansion. The primary effects of using the proposed site for solid waste disposal would be the loss of land from the local tax base and the increase in noise at the site; however, all of these changes would have already occurred in the construction of the existing landfill and construction/demolition waste landfill.

The Expansion will have a positive impact on the economic base of the surrounding community through employment opportunities for local residents and contractors and increase or maintain local business through the purchase of required goods and services. If the landfill Expansion were to not occur, these economic impacts would likely shift to a different municipality or region.

Vernon County will continue to operate the Expansion under the philosophy of managing waste locally and providing services to, first and foremost, its residents and local businesses. At this time, Vernon County does not intend to operate the Expansion as a regional facility that would accept significant amounts of waste from out of county. The service area proposed to utilize the landfill is proposed to be localized to Vernon County as it has operated historically. Refer to Section 11 for further discussion on service area.

Traffic impacts and patterns for users of the facility are anticipated to remain similar to the present throughout the operational life of the Expansion. The Expansion is proposed to service Vernon County and essentially will be an extension of the site's operating life. Therefore, traffic to local roads from hauling vehicles and recycling trucks are anticipated to remain similar to the level currently experienced and will be extended over the course of operation.

10.4.5 Other Special Resources

As discussed in Section 10.3.5, no special resources, including archaeological or historical areas, or prime agricultural land will be impacted by the proposed Expansion.

10.4.6 Probable Adverse Impacts that Cannot Be Avoided

Certain environmental impacts from the proposed Expansion cannot be avoided. To the extent practicable, the impacts will be minimized through engineering design and best management and operational practices. Probable adverse impacts that cannot be avoided include:

Land Use Impacts – During operation and after the landfill is closed there will be limitation on how the site is used. Construction of buildings or other structures may be limited or restricted.

Topographic Impacts – The topography and appearance of the site will be altered during construction and operation and following closure of the landfill.

Wildlife/Habitat Impacts – Localized plant and animal populations may be disturbed during construction and site operation. However, there are areas adjacent to the Expansion that will not be disturbed and are very similar to the area being removed for the Expansion.

Traffic Impacts – Traffic impacts are not anticipated to increase compared to existing conditions, but they will be extended due to an Expansion.

Odor/Emission Impacts – Odor and emission impacts are not anticipated to increase compared to existing conditions, but they will be extended due to an expansion. These impacts will continue to be minimized by good operating practices and optimization of the LFG collection system.

10.5 Alternatives

The following section provides a discussion on alternatives to the proposed Eastern Expansion and focuses on avoidance of environmental impacts, while considering the associated economic impacts. In accordance with s. NR 512.16(5) Wis. Adm. Code, the alternatives evaluated include:

- Taking No Action
- Enlargement, Reduction, or Modification of the Project
- Other Landfills or Locations
- Alternative Methods for Disposal (Waste Reduction/Recycling/Reuse/Incineration)

10.5.1 No Action Alternative

Since adopting a solid waste management plan and creating a solid waste management committee in 1986, the County has taken the lead role in managing solid waste for residents of the county. The “no action alternative” assumes that the proposed Expansion would not be developed. The existing landfill is expected to reach capacity in 2024 (**Table 11-5**). The proposed Expansion is necessary to continue to provide solid waste management services to the service area as it would be unlikely that individual communities would manage their solid and hazardous wastes as economically as the County does now.

If the proposed Expansion is not constructed, over 17,000 tons per year of waste currently received will have to be disposed of at other landfills or solid waste facilities. This would shorten the life of the other landfills and increase the need for additional waste disposal facilities in the area. There would be additional cost for transportation to the other facilities as it is likely that waste would have to be transported to a larger existing private landfill, which are located more than 100 miles away. Also, there is no guarantee that the disposal capacity replacement required under the no action alternative could be approved of at a site where potential impacts can be minimized to the same extent that they are by the proposed Expansion.

If the proposed Expansion did not proceed, this would avoid the environmental impact associated with this portion of the landfill property, however, this would not result in any avoidance of existing environmental impact associated with the existing landfill. The proposed Expansion utilizes land already dedicated to landfilling activities, has environmental controls already in place, and has been accepted by the local communities.

There would be several negative impacts to socioeconomic factors discussed in Section 10.4.4. The no action alternative will result in limited environmental benefit but would have significant negative consequences. Therefore, the no action alternative is not feasible.

10.5.2 Enlargement, Reduction, or Modification

The proposed Expansion has been designed to optimize disposal volume within the constraints of site conditions, regulatory requirements, and economic considerations. Enlarging the proposed Expansion area is not feasible due to the physical constraints of the site and regulatory limits not permitting landfill expansion life to exceed 15 years. The area west of the existing landfill is limited by shallower bedrock and an existing high pressure natural gas line. The area south of the

current landfill is constrained by the leachate collection system and other existing landfill related infrastructure and an overhead power line. The area to the north and west of the existing landfill is constrained by shallow bedrock.

Reducing the size of the proposed Expansion would likely result in under-utilization of the existing landfill property and result in loss of air space for the service area. Due to the constraints above, the area of potential contiguous expansion will reach its feasible limits with this Expansion. If the size of the site is reduced, that would require the County to pursue another expansion in the future or permit a new green site sooner and not capitalize on the efficiencies of a contiguous expansion (use of LFG management systems, leachate management systems, roads, scales, etc.). Or it would require another landfill to pursue an expansion or development sooner to account for the waste currently being managed in the Vernon County system.

The design of the proposed Expansion has taken into consideration the above physical constraints and environmental impacts, along with economic considerations. The County actively seeks for opportunities to divert and recycle/re-use waste from the landfill and therefore fully understands the benefit to be gained in reducing air space consumption and will continue to do so. Therefore, at this time, modifying the proposed Expansion would not have a significant impact on mitigating environment impacts.

10.5.3 Alternative Landfills

Vernon County currently has agreements in place with 21 of the 33 municipalities in Vernon County to deliver waste to the Vernon County Landfill. The system supports Wisconsin's Solid Waste Reduction, Reuse, Recycling, Composting, and Resource Recovery Policy (WI Stat § 287.05), which states "that maximum solid waste reduction, reuse, recycling, composting and resource recovery is in the best interest of the state in order to protect public health, to protect the quality of the natural environment and to conserve resources and energy." Potential alternative landfills to manage waste generated within the Vernon County Landfill service area are listed below.

MSW Landfill	License No. / Permit No.	County, State	Distance (Miles)
La Crosse County Solid Waste Landfill	3253	La Crosse, WI	40
Monroe County Ridgeville II Sanitary Landfill	3660	Monroe, WI	35
GFL – Seven Mile Creek Landfill	3097	Eau Claire, WI	112
WM – Cranberry Creek Landfill	2967	Wisconsin Rapids, WI	102

For Wisconsin Landfills, remaining capacities and site life are provided below from the 2022 WDNR Landfill Tonnage Report.

WDNR Tonnage Report (2022):

- La Crosse County Landfill has an estimated 11 years of remaining site life.
- Monroe County Landfill has an estimated 3 years of remaining site life.
- GFL – Seven Mile Creek Landfill has an estimated 8 years of remaining site life.
- WM – Cranberry Creek Landfill has an estimated 6 years of remaining site life.

La Crosse County Landfill:

La Crosse County Landfill recently received approval for expansion, which will increase airspace capacity by approximately 3,085,865 cubic yards and increase the remaining site life by as much as 13 years. Per La Crosse County Landfill feasibility report, the current landfill without expansion will reach capacity in 2030, however with expansion its site life has been extended to approximately 2037 or 2043 depending on Xcel Energy's participation in the solid waste management system. With expansion, this results in remaining site life of approximately 14 to 20 years inclusive of expansion and existing capacity. The landfill is located 40 miles from the Vernon County Landfill. La Crosse County Landfill currently has a service area that broadly encompasses Buffalo, Trempealeau and La Crosse Counties in Wisconsin, and Houston and Wabasha Counties in Minnesota.

Monroe County Landfill:

Monroe County Landfill received positive feedback on the feasibility determination to expand, which would increase airspace capacity by approximately 810,000 cubic yards. Per Monroe County Landfill feasibility report for their Northern Expansion, Monroe County does take out of county waste. However, its primary service area is Monroe County as the landfill is relatively small and has the intent of providing service primarily to County residents. It is anticipated that Monroe County Landfill would not be willing to accept all waste from Vernon County service area, thereby depleting valuable air space intended for Monroe residents.

Seven Mile Creek Landfill (GFL):

Seven Mile Creek Landfill – GFL recently received positive feasibility determination to expand, which will increase air space capacity by approximately 4.13 million cubic yards. However, it was indicated that this would only increase the remaining site life by approximately 9 years, which would increase the remaining site life to be approximately 17 years (inclusive of existing permitted airspace).

Cranberry Creek Landfill (WM):

Per correspondence with Tony Peterson (WDNR), Cranberry Creek Landfill is in progress with a feasibility study for a proposed expansion. The preliminary volume indicated in their ISR is approximately 4.05 million CY.

Although feasible to use alternate facilities, diversion of Vernon County service area tonnage would reduce the remaining capacity and site life of these facilities, which will cause these facilities to either expand sooner than expected or permit for a new landfill. Although municipally owned facilities are located within reasonable distances (i.e., La Crosse and Monroe County being the closest), there is no guarantee these facilities would accept all or a portion of Vernon County waste. Therefore, it would be reasonable to expect Vernon County waste would be transported to a privately owned facility over 100 miles away which could be a likely outcome without expansion considering the local transfer station in Vernon County is privately owned. This could potentially result in transporting Vernon County waste distances as much as 100 miles or more (single-trip, one way) and would increase wear and tear on roads, increase GHG emissions due to the haul distance, and would likely result in increased tipping fees to Vernon County residents. The negative environmental consequences of these scenarios could be significant.

Utilization of alternative landfills will result in little environmental benefit to Vernon County, increase the environmental impact at the alternative facilities and could have significant negative consequences, compared to the proposed Expansion.

10.5.4 Alternative Locations

There are few suitable landfill locations in Vernon County due to the unique topography, geology, and hydrology in the region, which restricts potential landfill sites to either ridge tops or valleys which may not meet bedrock separation distances or surface water locational criteria in NR 504.06(2)(c) and NR 504.04(3)(a), respectively. Suitable nearby clay borrow sources for liner material can also be difficult to find. For these reasons, and many others such as finding suitable locations with respect to population centers, highways and airports make it exceedingly difficult to site a new landfill location within the County.

The proposed Expansion utilizes land already dedicated to landfilling activities, has environmental controls already in place, and has been accepted by the local communities. Also, creating the same amount of landfill capacity in an undeveloped location would not take advantage of the efficiencies of a contiguous expansion including the utilization of existing infrastructure such as leachate management systems, environmental monitoring network, roads, scales, and operations support infrastructure.

10.5.5 Alternative Methods for Disposal

In efforts to conserve air space and maximize the value of discarded resources, the County provides opportunities for system users to divert reusable resources from the landfill and works with stakeholders to find uses for the diverted waste streams. Vernon County offers a recycling and HHM collection program. Residents can bring recyclables and HHM to the Vernon County Recycling Center located on the same property of the existing landfill.

Vernon County is the RU for collection of household recyclable materials such as paper, glass, plastic, and metal cans for all municipalities in Vernon County except the Town of Liberty. Individual municipalities contract with local haulers for curbside collection of recyclable items. Drop off facilities are also common in the County for collection of recyclable materials, particularly in rural areas or where there is a convenience need. Vernon County also provides two “Clean Sweep” events per year taking in HHM from residents to be recycled. Vernon County regularly accepts at their recycling facility located at the landfill other items such as e-waste, mattresses, tires, batteries, and bulbs for a fee throughout the year. Additionally, Vernon County accepts automotive fluids such as oil, antifreeze, gasoline, diesel, brake fluid, and oil filters at no charge for recycling. Vernon County intends to continue these programs during operation of the Expansion and may expand collection efforts where opportunities arise.

Activities like waste diversion and recycling have been effective at reducing the quantity of waste entering the waste stream. However, not all waste is suitable for reuse or recycling, and waste reduction and recycling technologies still have residual waste which currently requires the need for landfilling. Recent reductions in the acceptance of United States recyclables by China (China Sword Policy) has resulted in recycled materials stacking up with little market value. Much of this material had to be landfilled while the recycling industry addressed recycling contamination issues and moved to identify alternative markets. Market value for recyclable materials have historically been volatile, and major market disruptions such as the China Sword Policy have significant short and long-term effects on the viability of recycling programs. Elimination of landfills, or not providing sufficient air space within landfills, will likely result in improper management of waste and create much larger environmental impacts than a properly designed and operated landfill.

11 Need and Design Capacity {NR 512.17}

11.1 Introduction

This section presents an evaluation of need for the proposed Eastern Expansion. The Expansion design will add an estimated net (including waste and daily and intermediate cover) 430,000 CY of airspace to the landfill's current capacity which will create approximately 15 years of additional site life. Per Wisconsin Statute, s. 289.29(1)(d), the maximum site life for a solid waste disposal facility is limited to 15 years.

To receive approval for landfill expansion, an evaluation of need and design capacity must be made in accordance with NR 512.17 and Wisconsin Statute, s. 289.28. WDNR will also consider the effect of planned and existing waste reduction and recycling activities and other existing or proposed competing solid waste facilities, regardless of whether the other facilities are located within the service area of the proposed landfill.

In assessing the need for the proposed Expansion, the WDNR will consider the following issues:

1. The approximate service area for the facility which takes into account the economics of waste collection, transportation, and disposal;
1. The volume of waste suitable for disposal at the facility and generated within the anticipated service area;
2. The design capacity of the following facilities located within the anticipated service area of the facility:
    a. Approved facilities, as defined under Wisconsin Statute, 289.01, including the potential for the expansion of those facilities on contiguous properties already owned or controlled by the applicant;
    b. Non-approved facilities, as defined under Wisconsin Statute, s. 289.01, which are environmentally sound—the assumption being that a non-approved facility is not environmentally sound unless evidence to the contrary is produced;
    c. Other facilities for which FRs have been submitted and determined to be complete by the WDNR;
    d. Facilities for the recycling of solid waste or for the recovery of resources from solid waste that have been licensed by the WDNR;
    e. Proposed facilities for the recycling of solid waste or for the recovery of resources from solid waste for which plans of operation have been approved by the WDNR;
    f. Solid waste incinerators licensed by the WDNR; and
    g. Proposed solid waste incinerators which have plans of operation that have been approved by the WDNR.

The following sections are intended to address the above issues and provide information to demonstrate the need for the proposed Vernon County Landfill Eastern Expansion. The discussion in the following sections assesses the need for the Expansion based on the solid waste volumes in the service area while considering effects of waste reduction and recycling initiatives.

11.2 Service Area

To demonstrate the need for the proposed Expansion, it's necessary to define the service area that has a reasonable expectation to utilize the air space permitted. Generally, service areas are referred to on a county-wide basis, but in some circumstances not all municipalities within certain counties dispose of waste in the same location. Generally, it is not uncommon for nearby municipalities within a reasonable hauling distance to dispose of waste at competing haulers and disposal locations that offer varied pricing. Particularly if a municipality is in the outskirts of the jurisdictional limits of the county. As a result, there can be overlapping service areas between competing disposal locations and service areas which are continually changing.

The proposed Expansion will continue to be owned and operated as a municipally owned solid waste disposal facility. The Vernon County landfill service area is shown on Figure 1 in **Appendix F**. Vernon County currently has agreements in place with 21 of the 33 municipalities in Vernon County to deliver waste to its landfill and it is anticipated that additional municipalities will participate.

Vernon County is unique as its service area is localized to the municipalities within Vernon County. Service areas for municipally owned and operated landfills are typically established, through local ordinance, to secure waste from within their boundaries, but also may accept waste from surrounding areas. Chapter 54 of Vernon County Municipal Ordinance contains a solid waste flow control ordinance requiring persons who may be subject to the ordinance to dispose of solid waste at the Vernon County Landfill. Generally, Vernon County's approach to solid waste management has always been, and continues to be, to manage waste locally and provide disposal services, first and foremost, to its residents. Although Vernon County can accept waste from out of county, it is not currently a significant source of incoming waste tonnage. Vernon County does not currently nor is anticipated in the future to actively pursue waste generated outside of Vernon County to establish itself as a regional facility and/or for creating additional revenue streams. Therefore, for the purpose of this analysis the service area is defined as Vernon County only.

11.2.1 Economics of Disposal

An important part of determining the service area of a facility is analyzing the economics of waste collection, transportation, and disposal. As of 2019, tipping fees for Wisconsin landfill facilities that are located in the vicinity of the service area, range from $49 to $72 per ton. Vernon County Landfill's tipping fee is currently $65 per ton.

Like many public landfills, Vernon County does not provide waste hauling services within the service area as they encourage public/private partnerships. Inconsistent, or consistently changing tipping fees within a service area, can result in haulers seeking alternative disposal facilities. The Vernon County Landfill has only implemented minimal increases in tipping fees ($50 in 1993 to current $60) in the past several decades and has engaged the system haulers well in advance for their input and preparation. Additionally, the current agreements in place with participating municipalities offer a flat rate tipping fee with the option to participate in a rebate program depending on their level of commitment to the system.

Given the location of the landfill, with respect to the service area population, most of the waste received at the facility is direct hauled to the facility in collection trucks. A single privately operated transfer station is also located within Vernon County near Viroqua. Transfer stations

provide a temporary collection point where waste can be consolidated and hauled, usually in larger quantities, to final disposal or processing locations.

Vernon County has formal agreements in place with most of the municipalities and their haulers within the service area, and it is anticipated more municipalities will participate in the formal agreement. These agreements are indicative that waste generated within Vernon County is committed for disposal to the existing site. Vernon County is not actively pursuing waste outside its current service area footprint.

11.2.2 Service Area Overlap

Vernon County Landfill services the needs of the County and currently is not competing for waste with other regional facilities. Vernon County desires to preserve its airspace for use by Vernon County residents, business, and institutions. Typically, a needs analysis includes an inquiry into the service areas of competing landfills to determine if any overlap exists and how that might impact incoming waste quantities. However, with the service area only consisting of Vernon County, an overlap analysis is not applicable. Although other facilities within the region such as Waste Management's Cranberry Creek Landfill in Wood County and Monroe County Landfill have listed Vernon County as part of their service areas in their respective feasibility reports, it is not anticipated these facilities routinely receive significant amounts of MSW generated within Vernon County. Most likely these facilities have indicated Vernon County as part of their service area to acknowledge occasional waste is or has been received during their respective operating history and therefore taking this occasional waste into consideration as part of their site life analysis.

Additionally, as the ability of MSW landfills to accept additional non-MSW waste types has expanded since establishment of Subtitle D regulations including industrial and special wastes, it is likely these nearby facilities have received non-MSW waste types generated from Vernon County to which they may have the current regulatory approvals and capacity to accept such waste. Whereas disposal of such waste at Vernon County would deplete airspace much sooner, thus shortening disposal capacity that is primarily dedicated to MSW and C&D waste generated by local residents and businesses. It's reasonable to expect that the services of a larger landfill outside the County may be needed on occasion to manage non-MSW waste types that may require special infrastructure, manpower/equipment, etc. for which a larger facility may be better equipped. Therefore, the inclusion of Vernon County as part of the service area for these nearby facilities is not likely a reflection that Vernon County is a considerable contributor of MSW to these facilities. Vernon County has the ability and capacity (with the Expansion) to manage the vast majority of waste generated in Vernon County.

Table 11-1 includes a summary of the remaining site capacity and service area population characteristics for the Vernon County Landfill. The remaining site capacity listed in **Table 11-1** is as reported on the 2022 Annual Tonnage reports provided on the WDNR website. Population data for Vernon County was obtained through the Wisconsin Department of Administration online Demographic Services Center. Historical waste acceptance at Vernon County Landfill dating back to 2007 is summarized on **Table 11-2**.

11.3 Waste Quantities and Disposal Rates

11.3.1 Average Statewide Disposal Rates

Solid waste disposal rates can be averaged on a per-capita basis for Wisconsin residents. The estimated population growth rate for Wisconsin between 2010 and 2022 is estimated to be 0.38%. The disposal rates, identified in **Table 11-3** are based on statewide averages and are assumed to be representative of the service area.

The total amount of waste disposed of in Wisconsin MSW and industrial landfills in 2022 was approximately 8,450,322 tons which includes all waste types and waste originating from out-of-state. This total was then divided by the estimated population of Wisconsin in 2022 (5,949,155) to determine the per capita annual waste disposal of Wisconsin residents in 2022 (1.42 tons/per capita, per year). Between 2018 and 2022, the average per capita annual waste disposal rate was 1.43 tons, or 7.84 lbs per person per day (**Table 11-3**). The solid waste disposal tonnage for Wisconsin was converted to volume utilizing the suggested waste density for landfill waste of 1,500 lbs/CY. The corresponding total 2022 estimated landfill air space consumption rate for Wisconsin is approximately 11,267,096 CY.

In recent decades, recycling efforts have seemingly reduced waste disposal rates in Wisconsin landfills. However, waste disposal rates have seemingly plateaued in the past 10 years (**Table 11-3**). Wisconsin Act 335 established prohibitions on disposal of certain types of waste in landfills. Prohibitions became effective in the early 1990's. The prohibitions included white goods, car batteries, waste oil, and yard waste. Act 335 was followed by NR 544 Wis. Adm. Code, which provides guidance to help implement and maintain effective recycling programs. In 1995, cardboard containers and packages, magazines, glass, plastics (#1 and #2), steel and aluminum containers, newspaper, office paper, and tires were prohibited. State-wide, mandatory recycling of electronic devices was made effective in 2010. Local ordinances may impose additional prohibitions.

Though these recycling laws have been effective for decades and their impacts have been observed, resource recovery and recycling efforts may be further expanded or modified again in the future. Fluctuation in prices paid for recovered materials as well as use of products comprised of prohibited materials may further influence trends in recycling.

11.3.2 Service Area Waste Disposal Rate (per Capita)

To estimate per capita disposal rates for the Vernon County Landfill's service area, the state-wide average disposal rate of 1.43 tons/person/year (or 7.84 lbs/person/day) from 2018-2022 was used (WDNR, 2022). It's likely that the state-wide waste generation and disposal rates are greater than those at the local level, particularly due to inclusion of industrial waste landfills which may not be reflective of the rural setting of Vernon County. However, the higher state-level estimate helps compensate for the fact that local per capita generation rates are more variable, and it's difficult to discern a true boundary for the service areas of respective landfills. Service area boundaries can change and overlap frequently and on a temporary basis, making it not only difficult to identify the point-source origin of waste, but also how much waste is from where and from who. Even though Vernon County has an idea of the origins of the waste it receives as it strives to maintain waste locally, other landfills may occasionally receive varying quantities of waste from outlying areas of Vernon County, and vice versa. Using the state-wide consumption rate helps to estimate a potential maximum of waste that could be disposed at Vernon County

Landfill as well as to gauge how much waste generated within Vernon County may potentially be disposed of elsewhere.

The estimated tonnage per capita rate of waste disposed within the Vernon County service area is shown in **Table 11-4.** The table uses a landfill in-place density of 1,500 lbs/CY to convert to volume. **Table 11-4** suggests that disposal demand for Vernon County's service area may be as high has 44,250 tons/year (59,000 CY/year). Disposal rate projections for the service area were calculated using the statewide per capita disposal rate (calculated in **Table 11-3**) and applied back to the specific service area using population data (provided in **Table 11-1**). As the population increases in the service area, the volume of solid waste generated and disposed is expected to also increase. Based on the 2020 Census, the Wisconsin Department of Administration population estimates, and recycling efforts, waste disposal rates are expected to increase commensurate with population growth of approximately 0.22 percent per year for Vernon County. This compares to a 0.38 percent per year increase statewide.

11.3.3 Vernon County Landfill Waste Disposal Rate

According to the WDNR tonnage reports, and as summarized in **Table 11-2**, the average tonnage of waste accepted at the Vernon County Landfill between 2018 and 2022 was 18,926 tons. Utilizing the suggested waste density for landfill waste of 1,500 lbs/CY, the average airspace consumed during the past five years was approximately 25,234 CY/year. Generally, the Vernon County Landfill has experienced an increasing trend in waste disposal quantity since initial operation of the landfill. Since 2007, waste disposal has increased by an average annual rate of approximately 1.56%. In the previous five years (2018-2022), that rate equates to approximately 2.10%. The compound annual growth rate, which calculates the constant rate of increase over this same five-year period is 1.62% The median growth rate since 2007 is approximately 2.39%. To be conservative, the lowest calculated waste demand growth rate (i.e., annual average) of 1.56% was utilized to project future waste disposal rates to determine when the Expansion and current remaining permitted airspace will be consumed.

11.3.4 Existing Waste Reduction Activities

Recycling and waste reduction activities have been implemented at the Vernon County Landfill over the past several decades. These efforts have had significant positive impacts establishing better uses for the materials, as well as preserving valuable land and disposal air space. Although these efforts have been successful at diverting waste from the landfill, the tonnage values presented in this analysis represent an increase in the amount of landfilled waste after waste reduction initiatives. The following is a summary of the existing waste reduction efforts being implemented at the Vernon County Landfill.

11.3.4.1 Recycling Program

Beginning in 1991, the Vernon County Solid Waste and Recycling program has served as the Responsible Unit for the municipalities located within Vernon County except the Town of Liberty. The recycling program provides roll-off containers and curbside delivery and pick up to each participating municipality. The source separated recycled materials are delivered to the recycling building, located at the landfill property, where they are further processed, sorted, and bailed for subsequent sale. The Vernon County recycling program was recognized with the WDNR Wisconsin Recycling Excellence Overall System Award during 2020.

11.3.4.2 Citizens Drop-off Area

Vernon County provides a public drop-off site to homeowners, renters, and businesses located within Vernon County. In 2019, the citizens drop-off area was expanded to include bins for source separated recyclables and provides a valued convenience to the system users and is much safer than allowing the public access to the active landfill and recyclable material processing areas with equipment operators and haulers. Drop off items include:

- Source separated recyclables (plastic, glass, tin, paper, metal)
- Tires
- Large items: Furniture and furnishings including upholstered items.
- General household waste, toys, bikes, grills, lawnmowers (without gas and oil), mattresses, appliances, and other items.
- Demolition/Construction Debris: Wood, drywall, doors, windows, sinks, toilets, tubs, roofing, bricks, carpets, tile, and flooring.
- Garbage: Normal household waste like bagged waste, paper, and food waste
- Other: Yard waste/grass clippings, shingles, brush, and animal carcasses
- Refrigerators, dehumidifiers, air conditioners

11.4 Design Capacities within Service Area

The design capacities of facilities located near the Vernon County Landfill service area are discussed in the following subsections. Facilities discussed include other approved, non-approved, and proposed disposal, recycling and recovery facilities, and solid waste incinerators.

11.4.1 Approved Solid Waste Facilities

As defined under Wisconsin Statute, s. 289.01, an “approved facility” is “a solid or hazardous waste disposal facility with an approved Plan of Operation (POO) under Wisconsin Statute, s. 289.30, or a solid waste disposal facility initially licensed within three years prior to May 21, 1978, the owner of which successfully applies within two years after May 21, 1978, for a determination by WDNR that the facility’s design and Plan of Operation comply substantially with the requirements necessary for plan approval under Wisconsin Statute, s. 289.30.” This subsection describes approved facilities providing disposal capacity near the Vernon County Landfill service area, including the Vernon County Landfill. Section 11.2.2 discussed other approved facilities near the Vernon County service area that could or on occasion provide disposal capacity to Vernon County.

The Monroe County Landfill, located in Norwalk, Wisconsin, and La Crosse County Landfill, located in La Crosse and Onalaska, Wisconsin, are located in relatively close proximity to the Vernon County Landfill, but are publicly owned and are not competing within the Vernon County Landfill service area. La Crosse County and Monroe County prioritize waste from within their own respective service areas and would likely not be in favor of receiving excess waste from the Vernon County service area if its airspace capacity were to be depleted.

Waste Management’s Cranberry Creek Landfill located in Wisconsin Rapids is the closest privately operated facility to Vernon County. Cranberry Creek could potentially compete with Vernon County; however, this would result in Vernon County generated waste being hauled much greater distances compared to the Vernon County Landfill.

11.4.2 Non-Approved Facilities

Non-approved facilities are defined as “a licensed solid or hazardous waste disposal facility that is not an approved facility” by Wisconsin Statute, s. 289.01(24). No unapproved facilities are operating in the service area. No unapproved facilities are anticipated to be in operation during the life of Vernon County Landfill’s expansion. There is no indication that any other facilities are in operation or proposed for operation within the service area.

11.4.3 Other Proposed Facilities with Submitted Feasibility Reports

Although Vernon County does not compete with other landfills, other facilities who service the region which have recently submitted feasibility reports to the WDNR for proposed expansion include La Crosse County Landfill, Monroe County Landfill, and Seven Mile Creek Landfill in Eau Claire County. Cranberry Creek Landfill in Wood County has submitted an ISR and is currently in progress with their feasibility report. It is anticipated the Cranberry Creek Landfill expansion would be approximately 4.05 million CY. La Crosse County Landfill, Monroe County Landfill and Seven Mile Creek Landfill recently had their respective feasibility studies approved for expansion. La Crosse County was granted an additional 3.09 million CY of airspace. Monroe County Landfill was granted an additional 810,000 CY of airspace. Seven Mile Creek Landfill was granted an expansion of 4.13 million CY.

11.4.4 Existing Licensed Solid Waste Recycling and Resource Recovery Facilities

Wisconsin Act 335 established prohibitions on disposal of certain types of waste in landfills. Prohibitions became effective in the early 1990’s. The prohibitions included white goods, car batteries, waste oil, and yard waste. Act 335 was followed by NR 544, which provides guidance to help implement and maintain effective recycling programs. In 1995, cardboard containers and packages, magazines, glass, plastics (#1 and #2), steel and aluminum containers, newspaper, office paper, and tires were prohibited. State-wide, mandatory recycling of electronic devices was made effective in 2010. Local ordinances may impose additional prohibitions.

Though these recycling laws have been effective for decades and their impacts have been observed, resource recovery and recycling efforts may be further expanded or modified in the future. Changes in recycling rates have been recently observed due to recent changes in China and other foreign countries rejecting contaminated recycled materials exported from the United States. Recent trends indicate this will increase landfill waste disposal rates in the United States.

A local unit of government identified as the "responsible unit" generally oversees recycling efforts in Wisconsin. In many cases, the responsible unit (RU) is the county; however, smaller units of local government often maintain RU status for their own community within the county. Vernon County is the RU for most of the County except the Town of Liberty. RU’s are required to report annually to the WDNR specific household recyclable materials such as newspapers, cardboard, aluminum containers, glass, plastics, etc. RU’s may also report optional items that have been recycled such as yard waste, waste tires, etc. Per the 2021 WDNR annual reports from RU’s and material recovery facilities, a total of 410,011 tons of mandatory reportable materials were collected by RU’s and a total of 638,756 tons including all optional items were collected by RU’s. This equates to approximately 138 lbs. per capita of mandatory reported recyclables and 215 lbs per capita including optional reported materials.

Although a significant amount of waste materials is diverted to recycling and reuse facilities, the landfill disposal tonnages presented in this FR already exclude these materials. Thus, further supporting the need for landfilling as well as expanded waste reduction initiatives on a global scale.

11.4.5 Proposed Solid Waste Recycling and Resource Recovery Facilities

There's no indication that any new recycling and resource recovery facilities are proposed for operation within the service area.

11.4.6 Licensed Solid Waste Incinerators

There are currently only two licensed MSW incinerators operating in Wisconsin; the Barron County Waste to Energy and Recycling Facility located in Almena, WI, and the Xcel Energy French Island Refuse Derived Fuel (RDF) Facility located in La Crosse, WI. Both facilities are outside the Vernon County service area with the closest facility being the Xcel RDF Facility. Xcel and La Crosse County Landfill have established an agreement for regional solid waste disposal for which La Crosse County provides up to 75,000 tons of MSW annually to Xcel. Incinerated waste from both these facilities was not included in the per capita waste disposal rate calculation of **Table 11-3**, therefore no adjustments for per capita disposal rates are needed.

11.4.7 Proposed Solid Waste Incinerators

Currently, there's no indication that any additional solid waste incinerators are proposed for operation within the service area.

11.5 Existing Design Capacity of the Vernon County Landfill

11.5.1 Service Area Capacity (Per Capita Method)

Table 11-1 summarizes the remaining disposal capacity available to Vernon County. As of January 2023, 33,769 CY of airspace remain at the landfill. Utilizing per capita disposal rates calculated using statewide waste disposal data and applying it to the Vernon County service area, suggests a Vernon County per capita disposal rate of 59,000 CY/year. Utilizing this method, without the Expansion, the estimated site life and disposal capacity of the existing landfill will be consumed in 2023. With the Expansion, per capita disposal rates commensurate with population growth rates would provide disposal capacity to approximately 2030 assuming a favorable feasibility determination and Plan of Operation approval in 2024. Both these scenarios with and without the Expansion are summarized in **Table 11-6** and **Table 11-7**.

11.5.2 Remaining Capacity and Site Life of Vernon County Landfill (Historic Data Method)

Based on the 5-year average for airspace consumption presented in **Table 11-2**, Vernon County Landfill has less than 2 years of site life remaining as of January 2023. According to the WDNR tonnage reports, and as summarized in **Table 11-2**, the average tonnage of waste accepted at the Vernon County Landfill between 2018 and 2022 was 18,926 tons. Utilizing the suggested waste density for landfill waste of 1,500 lbs/CY, the average air space consumed during the past five years was approximately 25,234 CY/year. The WDNR's 2022 tonnage report estimates that 17,327 tons of municipal and non-municipal waste were disposed of at the Vernon County Landfill in 2022 (WDNR, 2020), suggesting an increasing trend over the past several years.

Several waste growth rates were calculated utilizing historical tonnage data dating back to 2007 and using the most recent data within the previous 5 years. For purposes of analyzing the additional site life the Expansion will add to the existing landfill, the most conservative (lowest) calculated growth rate was used to project future waste disposal rates. This equates to an average annual growth rate of 1.56% as shown in **Table 11-2**. Utilizing this growth rate and the previous 5-year average airspace consumption rate of 25,234 CY, the proposed Expansion volume of approximately 430,000 CY will be consumed within 15 years. This results in the total airspace (i.e., current remaining capacity and proposed Expansion capacity) being consumed by early 2039 assuming the Expansion airspace is approved for use in early 2024. The estimated site life for the Expansion utilizing projected future waste quantities and based on historical tonnage data is presented in **Table 11-5**.

11.6 Proposed Expansion Capacity

The design capacity for the proposed Vernon County Eastern Expansion was based on historical waste acceptance rates with consideration of service area demand. The proposed design capacity is approximately 430,000 CY.

The need for the proposed Expansion must consider future service area demands based on several waste loading scenarios. The proposed design capacity maximizes the available airspace within the remaining property at the Vernon County Landfill that is feasible to utilize, while balancing environmental and social impacts.

11.7 Need and Design Capacity Conclusion

To determine the need for expansion, the waste disposal rates for the service area were calculated based on a per capita method using statewide waste disposal data and applying it to the service area and based on historical tonnage data recorded at the existing landfill. As presented in **Table 11-6**, without the proposed Expansion, the estimated site life and disposal capacity within the service area will be consumed this year (2023) based on per capita disposal rates. Utilizing airspace consumption rates based on historic tonnage data, the existing landfill will reach capacity in 2024, which is likely the more realistic timeframe. Additionally, these disposal rates already reflect the impact of waste reduction and recycling initiatives as they exclude recyclable materials.

While it is likely that other landfills in the region could take Vernon County waste beyond 2024, it would likely result in impacts to those facility's site life assumptions and add additional costs to the service area residents (i.e., Vernon County) due to significant increases in waste hauling distances. As presented on **Table 11-5** and **Table 11-7**, with an approved expansion, the available disposal capacity to the service area will be extended to 2039 when utilizing historic waste disposal rates tracked at the facility or 2030 when utilizing per capita waste disposal rates. In either approach, the additional site life from the proposed Expansion would be less than the 15-year site life limit noted in state statute section 289.29(1)(d).

As shown in **Table 11-8**, the statewide disposal capacity is projected to last approximately 10 years beginning in 2024. With current disposal rates and current available disposal capacity, not including pending landfill expansions, landfill disposal capacity will be reached in Wisconsin during 2034. This indicates not only the need for the proposed Expansion of the Vernon County Landfill but also the need for other landfills to be developed or expanded in Wisconsin.

It is expected that the waste disposal rate at Vernon County Landfill will increase during the next 15 years. As a result, consumption of air space will increase over time as demonstrated by historic tonnage data since inception of the landfill. The factors that have caused most landfills in Wisconsin to reach capacity sooner than projected during the permitting process are challenging to define. Factors that can increase waste disposal rates include economic trends and local/global population increases. Changes in global recycling markets may cause increased waste disposal rates in the future. Natural or anthropogenic disasters can also significantly increase disposal rates for short periods. In 2018, flooding events contributed to an additional 1,784 tons of non-MSW waste being landfilled than the previous year.

The anticipated site life of the proposed Expansion is calculated by dividing the net landfill air space (430,000 CY) by the annual service area demand, with consideration of service area demand increases. Future service area demand projections are calculated using the average airspace consumption rate observed at the landfill between 2018 and 2022, plus the average annual waste growth rate between 2007 and 2022 of 1.56% (**Table 11-2**). Under this scenario, the proposed Expansion volume and currently existing landfill capacity as of January 1, 2023 is projected to be consumed in early 2039.

The need for the Vernon County Landfill Eastern Expansion is justified based on the projected site life for the Vernon County Landfill, and that landfills in Wisconsin have a limited capacity that will be reached in 2034 should no new landfills be sited, or Expansions permitted. The publicly owned Vernon County Landfill will continue to provide competition to other private municipal solid waste landfills in Wisconsin. Competition ensures Wisconsin residents can access reasonably priced waste disposal. If public landfills are not allowed to expand, their capacity will eventually be depleted. Reduced competition will allow private landfills to substantially increase their fees for disposal. Competition in a marketplace that has seen numerous mergers is needed to provide efficient, cost-effective, waste disposal. The proposed Expansion will ensure that the landfill continues to provide cost-effective and environmentally conscious waste management services for residents within the service area.

12 Evaluation of Alternatives to Land Disposal

This section provides an evaluation of alternatives to land disposal as required by NR 512.18. This section summarizes the state requirements in regard to alternatives, presents the alternatives, and evaluates their feasibility or current status of implementation and operation. This section also discusses the waste reduction and recycling activities for the proposed Expansion.

Many technologies exist for processing solid waste and reducing solid waste disposal quantities. The following discussion is a brief overview of the practical means available, or being actively practice, in the service area for reducing the amount of waste to be landfilled. These means include waste reduction, reuse, recycling, composting, co-composting, and incineration/energy recovery. Since the preparation of the FR for the existing landfill, Wisconsin has implemented several code and rule changes that have impacted waste going to landfills. These include mandatory recycling rules implemented at the local level and changes in fees that landfills pay. Each of these changes have been in place for a sufficiently long period of time that the impacts to the waste types and quantities received at Wisconsin landfills reflect those changes.

12.1 Description of Alternatives to Land Disposal

While landfilling is an important component of integrated solid waste disposal, it is only one of several waste management options. Solid waste disposal alternatives include waste reduction, reuse, recycling, composting, incineration, and processing. The feasibility of each of these options is based on factors such as cost/market economy, quantity, economies of scale, public acceptance, environmental protection, location, hauling and transportation systems, and long-term sustainability.

12.1.1 Waste Reduction

One key concept of waste reduction is the reduction of the quantity of materials used to produce and package consumer goods, thereby reducing the volume of waste requiring disposal. This practice eliminates waste from being created in the first place and is the most preferable method of managing waste. This type of resource management includes redesigning products to use fewer materials and choosing to use products that have minimal disposal requirements or that meet recycling standards.

Another key concept of this reduction method is the development of products with longer useful lives. This reduces the need to frequently replace items and results in a reduction of the amount of waste requiring disposal. This type of solid waste management is generally environmentally, socially, and economically acceptable as compared to many other potential management techniques.

Waste reduction can be implemented at all stages for production of goods, transportation methods and at the point of sale for many items. No matter at what stage waste reduction is implemented, it can reduce the costs of waste collection, transportation, processing, and disposal at the point of product use since lesser quantities of waste are involved.

Implementing waste reduction requires a change in product design and manufacturing practices and procedures. Industry could be a leader for implementing waste reduction efforts. However, industry typically responds to consumer demands and marketplace response to products. As such, consumers can influence industry practices through purchasing decisions. Local municipalities, through their effective recycling programs, can educate people on the need to closely consider the use of products with excess packaging and short useful lives.

During recent years there has been an increased emphasis on producer responsibility, particularly for products such as paint, computers and electronics, compact fluorescent light bulbs, and other materials that can contain hazardous or toxic materials. Several different models have been implemented in several states for the management of these types of products. In addition, several large communities and corporations are embracing the concept of zero waste as a mechanism to achieve sustainability. The emphasis of zero waste is to move materials up the waste management hierarchy.

Disposal costs or disposal costs savings for waste reduction are very difficult to estimate. Unless industry or large retailers force change through their sustainability programs, it would likely be up to governmental entities and consumers to be the primary driving force behind encouraging waste reduction at the manufacturing level. For waste reduction efforts to have a long-term impact, consumers would need to support manufacturers, and their distributors, that embrace waste reduction with their purchasing decisions. The cost-benefit of the public education process

and the corresponding reduction in waste quantity produced includes multiple variables and is very difficult to quantify.

12.1.2 Waste Reuse

The reuse of waste items reduces landfill needs, conserves resources, and in some cases, reduces the environmental impact of landfilling. Reuse applications include the use of multiple-use products as well as the sharing, repairing, and rebuilding of other items for reuse.

Industrial implementation of this solid waste management technique could possibly include the reuse of machinery, spare and extra parts, by-products, liquids, barrels, drums, pallets, and scraps. With the limited supply and increasing costs of natural resources, the high costs for raw materials and waste disposal will serve as an incentive for implementing waste reuse. Zero waste initiatives, or waste disposal reduction initiatives can also be an important driver in identifying reuse applications.

At the municipal level, mandatory reuse of products could be difficult to enforce so education and information on programs available to consumers for reuse of household items may be appropriate. Many domestic household items can be refurbished and reused, provided the proper resources and tools. Items such as clothing, appliances, and furniture are often donated to charitable organizations and local community groups. Increased reuse of waste items can be encouraged by working with organizations and providing publicity and assistance in promoting collection drives.

12.1.3 Waste Recycling

Recycling is the manual or mechanical separation of solid waste materials into constituents that can be physically and/or chemically changed into new or different products. Typical examples of recyclable materials include paper, cardboard, aluminum cans, glass, plastics, and scrap metals. Any of which can be used to produce new materials given that certain steps are taken during collection and storage.

Recycling programs often have an advantage over other methods of solid waste reduction techniques in that they are generally low technology. In addition, they can often be implemented rather quickly and are adaptable and flexible to program location and the market demands. The types of recycling programs most often implemented are classified by collection method, and include curbside collection, drop-off centers, and buy-back centers.

Curbside collection is the periodic pickup of recyclables at the curbside or at the point of generation. Dropoff centers are facilities where people can bring recyclables but are not compensated for their return. Buy-back centers are facilities where people can bring recyclables and be compensated for them.

Recycling programs and recycling centers can be managed by local municipalities, community organizations, or private businesses. Programs have been implemented by statutory and local requirements or can be completely voluntary. Vernon County is the RU for collection of household materials such as paper, glass, plastic, and metal cans for all municipalities in Vernon County except the Town of Liberty. Individual municipalities contract with local haulers for curbside collection of recyclable items. Drop off facilities are also common in the County for collection of recyclable materials, particularly in rural areas or where there is a convenience need. Vernon County also provides two “Clean Sweep” events twice per year taking in household hazardous materials (HHM) from residents to be recycled. Vernon County regularly accepts at

their recycling facility located at the landfill other items such as e-waste, mattresses, tires, batteries, and bulbs for a fee throughout the year. Additionally, Vernon County accepts automotive fluids such as oil, antifreeze, gasoline, diesel, brake fluid, and oil filters at no charge for recycling. Vernon County intends to continue these programs during operation of the Expansion and may expand collection efforts where opportunities arise.

Activities like waste diversion and recycling have been effective at reducing the quantity of waste entering the waste stream. However, not all materials are suitable for reuse or recycling, and waste reduction and recycling technologies still have residual waste which currently requires the need for landfilling. Recent reductions in the acceptance of United States recyclables by China (China Sword Policy) has resulted in recycled materials stacking up with little market value. Much of this material had to be landfilled while the recycling industry addressed recycling contamination issues and moved to identify alternative markets. Market value for recyclable materials have historically been volatile, and major market disruptions such as the China Sword Policy have significant short and long-term effects on the viability of recycling programs.

The general public is familiar with recycling and understands that there is a value to preserving landfill space. Based on the WDNR's "Status of Recycling Report" (WDNR, July 2003), Wisconsin is diverting approximately 40.4 percent of MSW. In addition, an EPA sponsored study (U.S. Recycling Economic Information Study, Prepared for The National Recycling Coalition, by R. W. Beck, Inc., July 2001) concluded that recycling and reuse directly contributes approximately $12.9 billion to government revenues, and contributes approximately $45.8 billion in total revenues, including indirect revenues.

12.1.3.1.1 Curbside Collection

This method involves the routine collection of recyclable household goods, such as paper, cardboard, aluminum, metals, glass, and plastics. Industrial and commercial collection is also possible if it proves to be economically feasible. Collection services are generally provided by municipal or private collection agencies. Collections may be single stream or source separated methods depending on the service provider.

This type of program is most convenient for the generator as it does not require the transport of materials. However, unless the program is locally mandatory, participation rates for household generators can be low. Well publicized programs that are a combination of both voluntary and mandatory efforts can be very successful.

State rules require that municipalities with populations of 5,000 or more and with an aggregate population density of at least 70 persons per square mile provide curbside collection of newspaper, glass, aluminum, and steel containers, #1 and #2 plastic containers, corrugated cardboard, and magazines at least once a month from single family and two to four-unit residences. They must also provide drop-off collection for materials that are not collected at curbside. Municipalities with populations less than 5,000 or an aggregate population density of less than 70 persons per square mile must provide either curbside or drop-off collection for single family and two-to-four-unit residences.

12.1.3.2 Drop-Off Centers

Drop-off centers are intended to provide easy disposition of mixed or separated recyclable materials. The types of facilities can range from unstaffed centers with separate large containers for individual recyclables, to full-scale fully staffed facilities, which provide disposition, processing,

storage, and transport of recyclables. In all cases, the generator must transport recyclable materials to the drop-off center at their expense.

This type of program can be voluntary or mandatory. Statutory requirements for Wisconsin require all communities with a population of 10,000 or more and all disposal facilities with an annual solid waste intake of less than 50,000 tons to provide waste separation and collection facilities. In addition, communities of 3,500 persons or more with stores that sell motor oil must provide waste oil collection facilities or provide information regarding where the nearest collection facility is located.

Participation rates for this method of collection are estimated to range from 10 percent for voluntary programs to almost 100 percent for mandatory programs. Well publicized programs typically achieve higher and more consistent participation rates.

12.1.3.3 Buy-Back Centers

This method of collection is similar to a drop-off center. Generators transport recyclables to the buy-back center and are financially compensated for the materials. Participation rates tend to be higher and more consistent due to the financial compensation. Many buy-back centers handle primarily industrial and commercial recyclable materials. Compensation for house-hold recyclables such as paper, cardboard, glass, and aluminum, may be provided.

12.1.4 Waste Composting and Digestion

Composting is the biodegradation of the organic portion of solid waste materials (food, wood, leaves, grass clippings, etc.). Since it is rich in humus (partially or wholly decayed vegetable matter), compost is generally used as a soil conditioner or mulch. Many different composting processes exist, ranging from simple backyard composting to automated composting in digesters to large scale operations with composting windrows.

Small-scale composting can be accomplished effectively by private residences, with little investment, and with end products immediately available for their personal use. Exemptions from regulation are granted in these instances, provided the composting is maintained in a nuisance-free manner and contains less than 50 cubic yards of material.

On a larger scale, materials are collected and prepared for composting by sorting out the materials that cannot be composted, then shredding and grinding the compostable portion, with the possible addition of sludges or water. Materials are then digested in open or closed digester systems and finished by regrinding and rescreening the compost to ensure uniform size, consistency, the lack of contaminants, and the proper water content. Generally, only a few bulk commercial and specialty markets exist for the sale of composted material and that limits the implementation of larger programs.

Organic waste collection and delivery to a small or medium size digester system has been implemented on a limited scale in Wisconsin in recent years. The digesters predominantly are available to process high organic waste streams such as food wastes from cafeterias, restaurants, schools/universities, or other locations where food or meals are processed. Supplementation of other organic materials, such as yard waste or manure may be used if the food waste stream is variable.

The State of Wisconsin through Statute 287.07 banned yard waste from landfills in an effort to reduce the volume of waste disposed of at landfills. As discussed above, yard wastes make up

the majority of material that is available as good composting material. Because yard waste is already banned from landfill disposal, composting yard waste will not save additional landfill space and is not an alternative to land disposal.

12.1.5 Co-Composting

Co-composting is basically the same as previously discussed for composting. Co-composting mixes various organic waste types together for composting. Municipal waste and sludge from wastewater treatment facilities are typically composted together. If co-composting is done in conjunction with an effective recycling program, little or no sorting of the municipal waste may be needed.

Recent experience indicates that much of the co-compost must be rejected during the final screening process in order to obtain a product that can be sold. This is due to the presence of small pieces of nondegradable waste that that were not initially removed creating a compost that is not visually appealing to most residential applications. These limitations often result in a co-compost product that is not economically viable.

12.1.6 Waste Incineration and Energy Recovery

Incineration is the controlled burning of solid waste materials to reduce the volume of materials requiring landfill disposal. Energy recovery is the process whereby usable energy is recovered during the waste incineration process. Incineration can reduce the volume of burnable solid waste by 80 to 90 percent or of total solid waste by 50 to 60 percent. This can extend the useful life of a solid waste disposal facility. Incineration can also alter the weight and volume of the refuse through the drying effect caused by complete or partial incineration.

Incineration and energy recovery systems are mass-burn or RDF systems. In a mass-burn system, solid waste materials are placed directly into an incineration chamber with little or no preparation or processing. In an RDF system, solid waste materials are processed into intermediate fuels referred to as pellets and are incinerated in commercial size boilers.

In many respects, mass-burn and RDF incineration processes are the same. Storage area for the fuel (refuse) must be available. Usually up to 3 days of storage are common to allow for continuous use of the facilities. Ash residue is collected in bottom quench tanks, which eventually convey the ash to a storage area. Electrostatic precipitators or scrubbers are used to collect particulates in the exhaust, commonly referred to as fly ash.

The French Island RDF facility is the only operating RDF plant in Wisconsin. The RDF facility blends wood waste and RDF, currently at approximately a 50/50 ratio, to create fuel for a fluidized bed boiler, which produces steam and electricity.

Barron County maintains the only other waste to energy facility in the State. Barron County is a mass-burn facility that produces steam which is sold to a nearby cheese production facility. Excess steam is also used to generate electricity.

12.2 Evaluation of Implementing Alternatives to Land Disposal

In efforts to conserve airspace and maximize the value of discarded resources, Vernon County provides opportunities for system users to divert reusable/recyclable resources from the landfill and works with stakeholders to find uses for the diverted waste streams. Vernon County will

continue to provide recycling services for typical household recyclables as well as HHM collection either through their fee-based program or semi-annual clean sweep events.

As is Vernon County's philosophy to manage waste locally and prioritize the needs of its residents, additional waste reduction, reuse, and recycling opportunities will continue to be evaluated and implemented, where feasible, during operation of the Expansion. To eliminate the need for landfilling requires societal changes on a global scale and no single alternative provides a comprehensive solution. Therefore, to continue to meet waste disposal needs of Vernon County residents at competitive prices, landfill activities will need to be expanded. Activities like waste diversion and recycling have been effective at reducing the quantity of waste entering the waste stream. However, not all materials are suitable for reuse or recycling, and waste reduction and recycling technologies still have residual waste which currently requires the need for landfilling. Recent reductions in the acceptance of United States recyclables by China (China Sword Policy) has resulted in recycled materials stacking up with little market value. Much of this material had to be landfilled while the recycling industry addressed recycling contamination issues and moved to identify alternative markets. Market value for recyclable materials have historically been volatile, and major market disruptions such as the China Sword Policy have significant short and long-term effects on the viability of recycling programs. Elimination of landfills, or not providing sufficient air space within landfills, will likely result in improper management of waste and create much larger environmental impacts than a properly designed and operated landfill.

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Table 5-1
Soil Borings within 300 feet of Proposed Expansion
Vernon County Landfill - Proposed Eastern Expansion

Soil Boring Nomenclature	Year Completed	Drilling Company	Ground Elevation (feet NAVD)	Depth to Saprolite (feet bgs)	Saprolite Elevation (feet NAVD)	Depth to Bedrock (feet bgs)	Bedrock Elevation (feet NAVD)	Total Depth of Boring (feet bgs)	Bottom Elevation of Boring (feet NAVD)
Existing Borings within 300-feet									
MW-3	1987	Ace Well Drilling	1233.0	14.0	1219.0	14.0	1219.0	180.0	1053.0
MW-4/-4P	1987	Ace Well Drilling	1232.9	14.0	1218.9	14.0	1218.9	160.0	1072.9
TB-4	1988	Wisconsin Test Drilling	1232.9	12.0	1220.9	14.5	1218.4	15.0	1217.9
TB-5	1988	Wisconsin Test Drilling	1221.0	22.0	1199.0	NE	NE	25.0	1196.0
TB-6	1988	Wisconsin Test Drilling	1218.7	13.5	1205.2	16.0	1202.7	16.5	1202.2
TB-7	1988	Wisconsin Test Drilling	1245.4	38.0	1207.4	NE	NE	47.5	1197.9
TB-8	1988	Wisconsin Test Drilling	1249.4	42.0	1207.4	45.0	1204.4	45.5	1203.9
MW-5A[(1)]	1989	Exploration Technology	1224.0	20.0	1204.0	35.0	1189.0	103.0	1121.0
MW-5	1988	Ace Well Drilling	1223.3	20.0	1203.3	35.0	1188.3	180.0	1043.3
MW-6	1988	Ace Well Drilling	1233.0	14.0	1219.0	14.0	1219.0	210.0	1023.0
MW-10	1989	Exploration Technology	1215.6	24.5	1191.1	61.0	1154.6	181.0	1034.6
MW-11	1989	Exploration Technology	1216.4	24.5	1191.9	61.0	1155.4	163.0	1053.4
MW-12	1989	Exploration Technology	1216.4	24.5	1191.9	61.0	1155.4	103.0	1113.4
TB-15	1989	Exploration Technology	1193.5	11.5	1182.0	NE	NE	12.0	1181.5
MW-14/14Z	2003	Traut Hydro Tech	1247.5	NONE	NONE	27.5[(2)]	1220.0	210.0	1037.5
B-15	2021	Mathy Construction Co	1252.9	NONE	NONE	40.0	1212.9	45.0	1207.9
B-16	2021	Mathy Construction Co	1245.9	NONE	NONE	32.0	1213.9	36.0	1209.9
B-17	2021	Mathy Construction Co	1238.8	NONE	NONE	28.0	1210.8	39.0	1199.8
Borings completed during 2022									
MW-14WT	2022	Braun Intertec	1247.2	28.5	1218.7	30.0	1217.2	109.0	1138.2
MW-15WT	2022	Braun Intertec	1220.6	39.5	1181.1	69.5	1151.1	99.0	1121.6
MW-16WT	2022	Braun Intertec	1184.7	34.5	1150.2	79.5	1105.2	76.0	1108.7
MW-16	2022	Braun Intertec	1184.3	34.5	1149.8	79.5	1104.8	98.0	1086.3
MW-17WT	2022	Braun Intertec	1196.4	11.0	1185.4	65.0	1131.4	93.0	1103.4
B-18	2022	Braun Intertec	1239.0	18.0	1221.0	24.0	1215.0	30.0	1209.0
B-19	2022	Braun Intertec	1233.3	20.0	1213.3	24.0	1209.3	28.0	1205.3
B-20	2022	Braun Intertec	1215.8	20.8	1195.0	24.0	1191.8	30.0	1185.8
B-21	2022	Braun Intertec	1226.1	NE	NE	NE	NE	31.0	1195.1

Notes:

bgs - Below ground surface.

NE - Not encountered.

NONE - No Saprolite present at this location.

(1) - Only page 1 of the soil boring log is available.

(2) - Depth to bedrock on the boring log appears to be skewed due to the Rotosonic drilling method used. The depth to bedrock provided here was determined using surrounding boring logs and geologic cross-section interpretations.

Table 5-2
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Geotechnical Results for the Landfill Property
Vernon County Landfill - Proposed Eastern Expansion

Boring ID	Sample No.	Sample Depth (feet bgs)	USCS Class	Moisture Content (w, %)	Grain-size Distribution					Atterberg Limits			Standard Proctor (ASTM D698)		Modified Proctor (ASTM D1557)		Soil Specific Gravity at 20C	Coefficient of Permeability (cm/sec)	Remolded Permeability (cm/sec)	Consolidated Undrained Test (total cohesion, tsf)	Consolidated Undrained Test (effective cohesion, tsf)	Density (pcf)
					Percent Gravel	Percent Sand	Percent Passing No. 200 Sieve	Percent Silt	Percent Clay	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Dry Density (pcf)	Optimum Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)						
Loess																						
MW-1RZ	S-1	3-6	CL	--	0.0	2.1	97.9	75.3	22.6	34.6	18.7	15.9	--	--	--	--	--	--	--	--	--	--
MW-7	S-4	4-5	CL	--	0.0	1.0	99.0	73.0	26.0	--	--	--	--	--	--	--	--	--	--	--	--	--
TB-1	1	2-5	CL	--	0.0	3.1	96.9	76.9	20.0	31.5	--	8.6	--	--	--	--	--	2.44E-07	--	--	--	--
TP-7	S1-7	1.5-2	CL	--	0.0	0.5	99.5	71.5	28.0	--	--	--	--	--	--	--	--	--	--	--	--	--
TB-7	--	2.5-16	CL	--	--	--	100.0	78.0	22.0	32.3	--	12.2	--	--	--	--	--	--	--	--	--	--
TB-8	--	2-6.5	CL	--	--	--	100.0	74.0	26.0	37.8	--	14.5	--	--	--	--	--	--	--	--	--	--
TB-9	--	1.5-9	CL	--	--	--	100.0	76.0	24.0	25.4	--	8.1	--	--	--	--	--	--	--	--	--	--
TB-10	S-2	3-4	CL	--	0.0	1.4	98.6	72.6	26.0	--	--	--	--	--	--	--	--	--	--	--	--	--
TP-8	1	3-4	CL	--	--	--	98.3	73.3	25.0	39.6	--	16.8	--	--	--	--	--	--	--	--	--	116.9
TP-10	1	2-3	CL	--	--	--	98.7	70.7	27.0	40.0	--	18.1	--	--	--	--	--	--	--	--	--	--
TP-11	1	1-2	CL	--	--	--	94.5	67.5	27.0	39.5	--	16.6	--	--	--	--	--	--	--	--	--	--
TP-15	1	1-2	CL	--	--	--	99.6	72.6	27.0	41.4	--	16.3	--	--	--	--	--	--	--	--	--	--
TP-15	2	3-4	CL	--	--	--	99.6	77.6	22.0	38.3	--	17.0	--	--	--	--	--	--	--	--	--	--
TP-20	1	2-3	CL	--	--	--	99.8	73.8	26.0	36.3	--	15.1	--	--	--	--	--	--	--	--	--	--
TP-20	2	4-5	CL	--	--	--	99.7	72.7	27.0	41.5	--	18.2	--	--	--	--	--	--	--	--	--	--
TP-20	3	8-9	CL	--	--	--	99.7	83.7	16.0	36.5	--	15.1	--	--	--	--	--	--	--	--	--	--
TP-21	1	2-3	CL	--	--	--	99.7	69.7	30.0	41.3	--	19.3	--	--	--	--	--	--	--	--	--	--
TP-21	2	6-7	CL	--	--	--	99.6	71.6	28.0	37.4	--	15.4	--	--	--	--	--	--	--	--	--	--
TP-22	1	3-4	CL	--	--	--	99.8	80.8	19.0	38.8	--	15.6	--	--	--	--	--	--	--	--	--	--
TP-25	1	1.5-2.5	CL	--	--	--	98.0	73.0	25.0	38.3	--	15.5	--	--	--	--	--	--	--	--	--	--
TP-27	1	1.5-2.5	CL	--	--	--	99.0	72.0	27.0	40.5	--	17.6	--	--	--	--	--	--	--	--	--	--
TP-C	1	3-3.5	CL	--	--	--	99.5	73.5	26.0	35.0	--	15.0	--	--	--	--	--	--	--	--	--	--
TP-C	2	5-6	CL	--	--	--	99.0	69.0	30.0	43.8	--	20.8	--	--	--	--	--	--	--	--	--	--
TP-D	1	3-4	CL	--	--	--	98.9	74.9	24.0	41.1	--	16.2	--	--	--	--	--	--	--	--	--	--
Average				--	0.0	1.6	99.0	73.9	25.0	37.7	18.7	15.6	--	--	--	--	--	2.44E-07	--	--	--	116.9
Geometric Mean				--	0.0	1.3	99.0	73.8	24.8	37.4	18.7	15.3	--	--	--	--	--	2.44E-07	--	--	--	116.9
Minimum				--	0.0	0.5	94.5	67.5	16.0	25.4	18.7	8.1	--	--	--	--	--	2.44E-07	--	--	--	116.9
Maximum				--	0.0	3.1	100.0	83.7	30.0	43.8	18.7	20.8	--	--	--	--	--	2.44E-07	--	--	--	116.9
Fine-grained Residuum																						
MW-1RZ	S-7	71-73	CH	--	13.4	26.3	60.3	32.9	27.4	71.3	30.4	40.9	--	--	--	--	--	--	--	--	--	--
MW-7	S-16	14-15	CL	--	2.4	23.4	74.2	30.2	44.0	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-14Z	S-1	48-50	CH	--	0.9	3.4	95.7	39.7	56.0	91.2	36.2	55.0	--	--	--	--	--	--	--	--	--	--
MW-14Z	S-2	66	CL	--	0.6	29.9	69.5	48.1	21.4	32.4	16.5	15.9	--	--	--	--	--	--	--	--	--	--
TB-1	4	9.5-10.5	CL	--	--	--	100.0	58.0	42.0	51.8	--	35.2	--	--	--	--	--	--	--	--	--	--
TB-3	2 & 3	1.5-6.0	CL	--	--	--	100.0	58.0	42.0	47.1	--	27.9	--	--	--	--	--	2.34E-08	--	--	--	--
TB-3	--	8.5-13	CL	--	4.0	37.3	58.7	6.7	52.0	48.5	--	29.8	--	--	--	--	--	--	--	--	--	--
TB-4	2	2-4	CL	--	--	--	100.0	50.0	50.0	53.4	--	33.8	--	--	--	--	--	--	--	--	--	--
TB-5	--	2-7.5	CL	--	--	--	100.0	31.0	69.0	55.3	--	32.2	--	--	--	--	--	1.13E-06	--	--	--	--
TB-6	5 to 7	8-13.5	CL	--	--	--	100.0	53.0	47.0	--	--	--	--	--	--	--	--	--	--	--	--	--
TB-10	S-4	14-16	CH	--	0.0	18.4	81.6	27.6	54.0	--	--	--	--	--	--	--	--	--	--	--	--	--
TB-11	S-2	5-6	CL	--	0.0	14.3	85.7	60.7	25.0	--	--	--	--	--	--	--	--	--	--	--	--	--
TB-11	S-5	20-21	CH	--	0.8	16.6	82.7	44.8	37.9	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 5-2
Page 2 of 3
Geotechnical Results for the Landfill Property
Vernon County Landfill - Proposed Eastern Expansion

Boring ID	Sample No.	Sample Depth (feet bgs)	USCS Class	Moisture Content (w, %)	Grain-size Distribution					Atterberg Limits			Standard Proctor (ASTM D698)		Modified Proctor (ASTM D1557)		Soil Specific Gravity at 20C	Coefficient of Permeability (cm/sec)	Remolded Permeability (cm/sec)	Consolidated Undrained Test (total cohesion, tsf)	Consolidated Undrained Test (effective cohesion, tsf)	Density (pcf)
					Percent Gravel	Percent Sand	Percent Passing No. 200 Sieve	Percent Silt	Percent Clay	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Dry Density (pcf)	Optimum Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)						
Fine-grained Residuum																						
TP-7	2	3-4.5	CL	--	--	--	88.6	62.6	26.0	35.0	--	15.2	--	--	--	--	--	--	--	--	--	--
TP-7	3	6-8	CH	--	--	--	78.5	28.5	50.0	56.0	--	29.9	--	--	--	--	--	--	--	--	--	--
TP-8	2	5-5.5	CL	--	--	--	52.8	26.8	26.0	42.3	--	23.5	--	--	--	--	--	--	--	--	--	--
TP-8	3	6-7	CH	--	--	--	95.3	70.3	25.0	54.8	--	29.4	--	--	--	--	--	--	--	--	--	--
TP-10	2	6-7	CL	--	--	--	43.5	14.5	29.0	48.9	--	24.3	--	--	--	--	--	--	--	--	--	--
TP-10	3	9-10	PT	--	--	--	96.9	28.9	68.0	113.5	--	56.4	--	--	--	--	--	--	--	--	--	--
TP-11	2	3.5-4	CL	--	--	--	73.6	31.6	42.0	47.8	--	25.9	--	--	--	--	--	--	--	--	--	--
TP-20	4	10-11	CL	--	--	--	61.2	22.2	39.0	45.0	--	23.3	--	--	--	--	--	--	--	--	--	--
TP-21	3	8-9	CH	--	--	--	59.8	27.8	32.0	55.5	--	30.8	--	--	--	--	--	--	--	--	--	--
TP-22	3	9-10	CL	--	--	--	73.4	37.4	36.0	49.5	--	23.6	--	--	--	--	--	--	--	--	--	--
TP-23	1	6.5-10	CL	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	113.5
TP-25	2	4-5	CH	--	--	--	78.9	21.9	57.0	63.6	--	35.7	--	--	--	--	--	--	--	--	--	--
TP-27	2	4-5	CH	--	--	--	84.0	34.0	50.0	65.0	--	32.6	--	--	--	--	--	--	--	--	--	--
TP-A	1	4-5	CH	--	--	--	91.5	37.5	54.0	62.8	--	32.4	--	--	--	--	--	--	--	--	--	--
TP-A	2	7-8	CH	--	--	--	78.6	28.6	50.0	58.2	--	31.0	--	--	--	--	--	--	--	--	--	--
TP-B	1	3-4	CL	--	--	--	96.4	62.4	34.0	38.9	--	16.4	--	--	--	--	--	--	--	--	--	--
TP-B	2	5-6	CL	--	--	--	73.1	34.1	39.0	45.3	--	22.7	--	--	--	--	--	--	--	--	--	--
TP-B	3	8-9	CH	--	--	--	84.8	15.8	69.0	63.5	--	32.5	--	--	--	--	--	--	--	--	--	--
TP-C	3	7-8	CL	--	--	--	60.9	18.9	42.0	54.2	--	28.7	--	--	--	--	--	--	--	--	--	--
B-18	499084	0-2	CL	20	1.1	14.6	84.3	54.0	30.3	38	19	19	--	--	--	--	--	--	--	--	--	--
B-18	499085	2-3.5	CH	27	0.0	14.4	85.6	20.4	65.2	64	24	40	--	--	--	--	--	--	--	--	--	--
B-18	499086	4.5-6	CH	27	0.0	36.5	63.5	17.7	45.8	51	19	32	--	--	--	--	--	--	--	--	--	--
B-18	499090	12-13.5	CH	27	0.0	29.5	70.5	14.2	56.3	72	23	49	--	--	--	--	--	--	--	--	--	--
B-18	B-18, 17.0	17-18.5	CH	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-19	497688, 499091, 522626	0-2	CH	---	0.0	25.5	74.5	30.5	44.0	50	17	33	105.0	19.6	116.7	15.0	2.67	--	5.4E-09	--	--	--
B-19	522626	0-2	CH	--	--	--	--	--	--	--	--	--	--	--	--	--		--	6.1E-09			
B-19	499092	2-3.5	CH	16	23.7	22.7	53.6	22.1	31.5	52	19	33	--	--	--	--	--	--	--	--	--	--
B-19	B-19, 4.5	4.5-6	CH	44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-19	B-19, 7.0	7-8.5	CH	53	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-19	B-19, 9.5	9.5-11	CH	54	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-19	499093	17-18.5	CH	57	0.0	3.3	96.7	8.4	88.3	105	34	71	--	--	--	--	--	--	--	--	--	--
B-19	B-19, 19.5	19.5-21	CH	57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-20	499095, 522628	0-2	CH	---	0.0	35.1	64.9	16.2	48.7	58	16	42	106.0	19.6	--	--	2.66	--	3.0E-07	--	--	--
B-20	B-20, 2.0	2-3.5	CL	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-20	B-20, 4.5	4.5-6	CL	27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-20	B-20, 7.0	7-8.5	CH	33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-20	B-20, 9.5	9.5-11	CL	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-20	B-20, 12.0	12-13.5	CH	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-20	B-20, 14.5	14.5-16	CH	46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-20	B-20, 17.0	17-18.5	CH	39	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-21	499096, 497689	0-2	CH	---	0.0	25.4	74.6	26.4	48.2	67	19	48	100.0	22.1	112.3	16.1	--	--	--	--	--	--
B-21	499098	2-3.5	CH	24	0.0	24.5	75.5	29.3	46.2	50	16	34	--	--	--	--	--	--	--	--	--	--
B-21	B-21, 4.5	4.5-6	CH	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-21	B-21, 7.0	7-8.5	ML	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-21	499099	9.5-11	CL	17	2.9	11.5	85.6	56.6	29.0	36	18	18	--	--	--	--	--	--	--	--	--	--

Table 5-2
Page 3 of 3
Geotechnical Results for the Landfill Property
Vernon County Landfill - Proposed Eastern Expansion

Boring ID	Sample No.	Sample Depth (feet bgs)	USCS Class	Moisture Content (w, %)	Grain-size Distribution					Atterberg Limits			Standard Proctor (ASTM D698)		Modified Proctor (ASTM D1557)		Soil Specific Gravity at 20C	Coefficient of Permeability (cm/sec)	Remolded Permeability (cm/sec)	Consolidated Undrained Test (total cohesion, tsf)	Consolidated Undrained Test (effective cohesion, tsf)	Density (pcf)
					Percent Gravel	Percent Sand	Percent Passing No. 200 Sieve	Percent Silt	Percent Clay	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Dry Density (pcf)	Optimum Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)						
Fine-grained Residuum																						
B-21	499100	12-13.5	CL	19	0.0	6.2	93.8	65.2	28.6	36	22	14	--	--	--	--	--	--	--	--	--	--
B-21	B-21, 14.5	14.5-16	CL	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-21	499101	17-18.5	CL	18	0.0	11.6	88.4	58.8	29.6	36	18	18	--	--	--	--	--	--	--	--	--	--
B-21	499102	19.5-21	CL	19	0.0	4.9	95.1	63.6	31.5	40	19	21	--	--	--	--	--	--	--	--	--	--
B-21	B-21, 24.5	24.5-26	CL	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-21	499104	29.5-31	CL	18	0.0	1.4	98.6	72.7	25.9	33	20	13	--	--	--	--	--	--	--	--	--	--
MW-14WT	499074	7-8.5	CH	37	0.0	32.0	68.0	9.8	58.2	64	22	42	--	--	--	--	--	--	--	--	--	--
MW-14WT	498838	26-28.5	CL	25	--	--	--	--	--	--	--	--	--	--	--	--	--	3.1E-08	--	--	--	101.2
MW-15WT	499075	17-18.5	CH	46	0.0	2.6	97.4	7.5	89.9	109	36	73	--	--	--	--	--	--	--	--	--	--
MW-16	MW-16, 7-9	7-9	CL	--	--	--	--	--	--	43	22	21	--	--	--	--	--	--	--	0.9366	0.2976	--
MW-16	499076, 498836	9.5-11.5	CL	24	0.0	3.9	96.1	66.0	30.1	37	21	16	--	--	--	--	--	3.0E-08	--	--	--	103.3
			Average	29.3	1.9	18.3	80.5	36.4	44.1	55.4	22.1	31.6	103.7	20.4	114.5	15.6	2.67	3.04E-07	1.04E-07	0.9366	0.2976	106.0
			Geometric Mean	26.8	2.5	13.3	79.0	31.1	41.6	52.8	21.4	29.1	103.6	20.4	114.5	15.5	2.66	7.04E-08	2.15E-08	0.9366	0.2976	105.9
			Minimum	15.0	0.0	1.4	43.5	6.7	21.4	32.4	16.0	13.0	100.0	19.6	112.3	15.0	2.66	2.34E-08	5.40E-09	0.9366	0.2976	101.2
			Maximum	57.0	23.7	37.3	100.0	72.7	89.9	113.5	36.2	73.0	106.0	22.1	116.7	16.1	2.67	1.13E-06	3.00E-07	0.9366	0.2976	113.5
Coarse-grained Residuum																						
MW-1RZ	S-2	13-15	SC	--	1.1	65.0	33.9	19.4	14.4	24.1	10.7	13.4	--	--	--	--	--	--	--	--	--	--
MW-1RZ	S-3	15-20	SM	--	0.0	77.4	22.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1RZ	S-4	33-34	SM	--	10.2	68.0	21.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1RZ	S-5	49-50	SC	--	6.9	57.9	35.2	17.3	18.0	40.1	17.6	22.5	--	--	--	--	--	--	--	--	--	--
MW-1RZ	S-6	58-60	GM	--	49.6	30.7	19.7	10.6	9.1	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1RZ	S-8	76-78	SM	--	2.3	51.4	46.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1RZ	S-9	86-88	SP-SM	--	0.9	87.8	11.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1RZ	S-10	88-90	SP-SM	--	67.7	21.1	11.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-14Z	S-3	76-78	SM	--	12.5	66.8	20.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TB-1	5	10.5-12	SC	--	0.0	55.4	44.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TB-1	--	12-13	SC	--	0.0	50.6	49.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TB-4	--	7-8	SC	--	6.7	74.5	18.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TB-5	--	7.5-10	SC	--	0.2	63.2	36.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TB-8	--	6.5-12	SC	--	0.5	81.3	18.2	9.2	9.0	--	--	--	--	--	--	--	--	1.35E-02	--	--	--	--
TB-8	--	14-22	SC	--	10.2	51.9	37.9	--	--	--	--	--	--	--	--	--	--	2.96E-07	--	--	--	--
TB-9	--	10-22	SM	--	1.7	86.2	12.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TP-11	3	6-7	SC	--	--	--	33.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TP-15	3	8-9	SC	--	--	--	29.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TP-27	3	7-9	SC	--	--	--	32.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-18	B-18, 7.0	7-8.5	SP	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-18	499088	9.5-11	SC	15	0.0	58.6	41.4	8.9	32.5	39	15	24	--	--	--	--	--	--	--	--	--	--
B-18	B-18, 14.5	14.5-16	SC	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-19	B-19, 12.0	12-13.5	GC	33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-19	B-19, 14.5	14.5-16	GC	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-16	499077	24.5-26	SC	18	0.0	62.1	37.9	11.4	26.5	41	17	24	--	--	--	--	--	--	--	--	--	--
MW-17WT	499079	4.5-6	SC	20	12.7	44.6	42.7	7.8	34.9	59	19	40	--	--	--	--	--	--	--	--	--	--
MW-17WT	499080	7-8.5	SC	17	8.9	47.7	43.4	13.4	30.0	39	12	27	--	--	--	--	--	--	--	--	--	--
MW-17WT	499082	9.5-11	SC	16	0.0	51.9	48.1	14.2	33.9	41	12	29	--	--	--	--	--	--	--	--	--	--
			Average	21.0	9.1	59.7	31.2	12.5	23.1	40.5	14.8	25.7	--	--	--	--	--	6.75E-03	--	--	--	--
			Geometric Mean	19.4	4.6	57.0	28.4	11.9	20.5	39.3	14.4	24.6	--	--	--	--	--	6.32E-05	--	--	--	--
			Minimum	10.0	0.0	21.1	11.2	7.8	9.0	24.1	10.7	13.4	--	--	--	--	--	2.96E-07	--	--	--	--
			Maximum	40.0	67.7	87.8	49.4	19.4	34.9	59.0	19.0	40.0	--	--	--	--	--	1.35E-02	--	--	--	--

Notes:
bgs - Below ground surface.
-- - Information not analyzed or not available.

Table 5-3
Summary of Monitoring Wells and Piezometers within 300 feet of Proposed Expansion
Vernon County Landfill - Proposed Eastern Expansion

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NAVD)	Top of Casing Elevation (feet NAVD)	Well Depth (feet bgs)	Screen Length (feet)	Screen Interval Elevation (feet NAVD)	Monitoring Point	Geologic Description of Screened Interval
Monitoring Wells and Piezometers Inside Expansion Footprint									
109	MW-5A	11/8/1989	1224.0	1225.81	103.3	15.0	1120.7 - 1135.7	Perched Water Table	dolomite, hard
108	MW-5	2/17/1988	1223.3	1225.32	150.6	10.0	1072.7 - 1082.7	Regional Water Table	dolomite, hard
119	MW-14Z	3/7/2003	1247.5	1250.22	210.8	5.0	1036.7 - 1041.7	Piezometer, Lower Zone	silty dolomitic sandstone
Monitoring Wells and Piezometers Within 150-feet									
118	MW-14	3/12/2003	1247.5	1249.69	186.1	15.0	1061.4 - 1076.4	Regional Water Table	fractured dolomite and sandy dolomite
125	MW-14WT	9/20/2022	1247.2	1249.70	106.0	15.0	1141.2 - 1156.2	Perched Water Table	Dolostone
127	MW-15WT	9/28/2022	1220.6	1223.24	85.0	10.0	1135.6 - 1145.6	Perched Water Table	Sandy Dolostone
129	MW-16WT	9/21/2022	1184.7	1187.41	75.0	10.0	1109.7 - 1119.7	Perched Water Table	Sandy Dolostone to Shale
131	MW-16	8/25/2022	1184.3	1186.92	97.0	5.0	1087.3 - 1092.3	Piezometer/Undefined	Sandy Dolostone
133	MW-17WT	9/26/2022	1196.4	1199.18	92.0	10.0	1104.4 - 1114.4	Perched Water Table	Weathered Sandstone
Monitoring Wells and Piezometers Within 300-feet									
105	MW-3	2/2/1988	1233.0	1235.25	180.0	5.0	1053.0 - 1058.0	Piezometer, Upper Zone	dolomite, hard
107	MW-4P	1/29/1988	1232.9	1235.19	95.0	10.0	1137.9 - 1147.9	Perched Water Table	dolomite, hard
110	MW-6	2/20/1988	1233.0	1235.37	202.2	5.0	1030.8 - 1035.8	Piezometer, Lower Zone	sandy dolomite
114	MW-10	9/15/1989	1215.6	1217.52	183.5	5.0	1032.1 - 1037.1	Piezometer, Lower Zone	dolomitic sandstone to sandy dolomite
115	MW-11	9/29/1989	1216.4	1218.56	162.5	15.0	1053.9 - 1068.9	Piezometer, Upper Zone	sandy dolomite to dolomitic sandstone
116	MW-12	9/22/1989	1216.4	1218.36	98.5	15.0	1117.9 - 1132.9	Perched Water Table	dolomite with occasional small vugs

Notes:
bgs - Below ground surface.

Table 5-4
Existing Static Water Elevations for Landfill Property (2018-2023)
Vernon County Landfill - Proposed Eastern Expansion

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NAVD)	Top of Casing Elevation (feet NAVD)	Well Depth (feet bgs)	Screen Length (feet)	Screen Interval Elevation (feet NAVD)	Well Type/ Groundwater Zone	Static Water Elevation by Date (feet NAVD)																
									3/14/2018	9/10/2018	3/11/2019	9/9/2019	3/9/2020	9/14/2020	3/1/2021	9/1/2021	3/1/2022	9/22/2022	12/20/2022	1/24/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023
102	MW-1P	12/30/1987	1236.4	1238.41	111.1	10.0	1125.4 - 1135.4	Perched Water Table	1132.01	1132.07	1132.55	1133.01	1132.6	1132.56	1131.67	1131.76	1131.42	1130.90	1130.02	1131.71	1131.70	1131.59	1131.98	1132.64
101	MW-1	12/30/1987	1236.4	1238.11	158.0	10.0	1078.5 - 1088.5	Regional Water Table	1098.79	1099.2	1103.13	1104.78	1103.09	1102.14	1096.58	1093.67	1091.85	1089.95	1089.70	1089.62	1089.62	1090.36	1092.19	1094.43
121	MW-1PR	1/12/1994	1245.0	1247.61	127.7	15.0	1119.9 - 1134.9	Perched Water Table	1134.86	1134.79	1135.15	1135.67	1135.4	1135.22	1134.80	1134.34	1134.23	1133.50	1134.07	1134.04	1134.22	1134.14	1134.72	1134.97
120	MW-1R	1/12/1994	1244.6	1247.25	164.6	15.0	1082.6 - 1097.6	Regional Water Table	1098.69	1099.14	1103.04	1104.59	1102.97	1102.03	1096.50	1093.58	1091.81	1089.95	1090.85	1090.60	1089.61	1090.36	1092.13	1094.46
123	MW-1RZ	3/12/2003	1244.0	1245.45	186.5	5.0	1057.5 - 1062.5	Piezometer, Upper Zone	1098.3	1098.75	1102.6	1104.2	1102.54	1101.58	1096.12	1093.19	1091.28	1089.51	1088.33	1089.11	1089.15	1089.84	1090.72	1093.86
104	MW-2P	1/17/1988	1252.5	1254.88	124.8	10.0	1128.0 1138.0	Perched Water Table	1139.82	1140.34	1140.64	1141.85	1141.03	1140.76	1139.87	1139.39	1139.33	1138.79	1138.81	1138.45	1139.36	1139.24	1139.98	1141.11
103	MW-2	1/17/1988	1252.5	1254.35	174.6	10.0	1078.3 - 1088.3	Regional Water Table	1092.72	1092.53	1095.31	1096.67	1095.32	1094.86	1091.56	1089.58	1087.79	1085.92	1086.19	1085.23	1086.01	1086.60	1087.51	1090.35
105	**MW-3**	**2/2/1988**	**1233.0**	**1235.25**	**180.0**	**5.0**	**1053.2 - 1058.2**	**Piezometer, Upper Zone**	**1077.49**	**1077.22**	**1080.8**	**1082.59**	**1080.42**	**1080.22**	**1076.06**	**1073.14**	**1070.69**	**1069.14**	**1068.69**	**1068.66**	**1068.69**	**1069.06**	**1069.19**	**1071.08**
107	**MW-4P**	**1/29/1988**	**1232.9**	**1235.19**	**95.0**	**10.0**	**1138.3 - 1148.3**	**Perched Water Table**	**1149.04**	**1150.85**	**1151.66**	**1153.37**	**1150.88**	**1151.96**	**1149.32**	**1149.32**	**1148.16**	**1148.92**	**1147.07**	**1146.72**	**1148.30**	**1148.18**	**1148.24**	**1151.19**
109	**MW-5A**	**11/8/1989**	**1224.0**	**1225.81**	**103.3**	**15.0**	**1122.9 - 1137.9**	**Perched Water Table**	**1136.26**	**1136.54**	**1137.88**	**1139.73**	**1137.72**	**1138.27**	**1136.34**	**1135.86**	**1135.52**	**1135.74**	**1134.78**	**1134.27**	**1134.29**	**1135.12**	**1135.58**	**1136.90**
108	**MW-5**	**2/17/1988**	**1223.3**	**1225.32**	**150.6**	**10.0**	**1072.6 - 1082.6**	**Regional Water Table**	**1083.51**	**1083.69**	**1086.30**	**1087.23**	**1085.93**	**1086.23**	**1084.59**	**1084.36**	**1083.94**	**1084.05**	**1081.46**	**1082.51**	**1082.60**	**1083.14**	**1083.50**	**1086.28**
110	**MW-6**	**1/12/1900**	**1233.0**	**1235.37**	**202.2**	**5.0**	**1025.7 - 1030.7**	**Piezometer, Lower Zone**	**1070.54**	**1071.89**	**1073.9**	**1075.63**	**1073.88**	**1073.53**	**1069.39**	**1067.35**	**1065.30**	**1063.84**	**1062.81**	**1062.48**	**1062.35**	**1062.48**	**1062.25**	**1063.27**
111	MW-7	11/7/1989	1255.7	1258.03	234.5	5.0	1023.5 - 1028.5	Piezometer, Lower Zone	1076.09	1077.19	1079.32	1080.77	1079.32	1078.89	1074.92	1072.83	1070.92	1069.39	1069.50	1068.20	1069.34	1074.93	1069.71	1070.14
112	MW-8R	11/13/1989	1256.1	1258.84	202.5	15.0	1056.3 - 1071.3	Piezometer, Upper Zone	1084.56	1084.3	1087.91	1088.96	1087.42	1086.93	1082.78	1079.31	1077.00	1075.30	1076.74	1075.12	1075.04	1075.74	1076.15	1079.52
113	MW-9	8/29/1989	1255.4	1257.50	126.8	15.0	1130.7 - 1145.7	Perched Water Table	1140.24	1140.36	1141.06	1142.21	1140.92	1141.14	1140.16	1139.74	1139.22	1138.73	1139.07	1139.25	1139.35	1139.24	1139.13	1139.79
114	**MW-10**	**9/15/1989**	**1215.6**	**1217.52**	**183.5**	**5.0**	**1034.0 - 1039.0**	**Piezometer, Lower Zone**	**1092.78**	**1092.99**	**1097.75**	**1099.58**	**1098.09**	**1096.89**	**1090.39**	**1086.65**	**1084.18**	**1082.08**	**1083.12**	**1081.66**	**1080.14**	**1082.75**	**1081.73**	**1086.63**
115	**MW-11**	**9/29/1989**	**1216.4**	**1218.56**	**162.5**	**15.0**	**1056.0 - 1071.0**	**Piezometer, Upper Zone**	**1097.89**	**1095.62**	**1102.91**	**1104.98**	**1100.85**	**1102.01**	**1093.69**	**1089.81**	**1089.22**	**1085.59**	**1086.25**	**1086.73**	**1086.75**	**1087.68**	**1090.31**	**1092.04**
116	**MW-12**	**9/22/1989**	**1216.4**	**1218.36**	**98.5**	**15.0**	**1119.9 - 1134.9**	**Perched Water Table**	**1130.62**	**1131.75**	**1132.41**	**1134.17**	**1132.29**	**1132.13**	**1130.62**	**1130.50**	**1129.69**	**1130.45**	**1128.48**	**1130.17**	**1130.87**	**1131.77**	**1133.62**	**1133.71**
117	MW-13P	2/26/2003	1224.5	1227.42	102.4	15.0	1122.1 - 1137.1	Perched Water Table	1134.05	1134.08	1134.44	1134.98	1134.6	1134.56	1134.00	1133.64	1133.46	1132.81	1133.40	1133.40	1133.21	1133.60	1134.40	1134.33
125	**MW-14WT**	**9/20/2022**	**1247.2**	**1249.70**	**106.0**	**15.0**	**1141.2 - 1156.2**	**Perched Water Table**	--	--	--	--	--	--	--	--	--	--	**1141.87**	**1146.01**	**1145.92**	**1146.67**	**1146.77**	**1146.98**
118	**MW-14**	**3/12/2003**	**1247.5**	**1249.69**	**186.1**	**15.0**	**1061.4 - 1076.4**	**Regional Water Table**	**1083.05**	**1082.42**	**1086.86**	**1087.89**	**1086.34**	**1086.00**	**1081.36**	**1077.76**	**1075.24**	**1073.32**	**1073.63**	**1072.80**	**1072.54**	**1073.44**	**1073.91**	**1077.46**
119	**MW-14Z**	**3/7/2003**	**1247.5**	**1250.22**	**210.8**	**5.0**	**1036.7 - 1041.7**	**Piezometer, Lower Zone**	**1080.29**	**1078.48**	**1083.98**	**1082.36**	**1082.78**	**1083.11**	**1078.69**	**1073.19**	**1072.26**	**1071.89**	**1071.20**	**1071.17**	**1071.09**	**1071.30**	**1071.96**	**1072.58**
127	**MW-15WT**	**9/28/2022**	**1220.6**	**1223.24**	**85.0**	**10.0**	**1135.6 - 1145.6**	**Perched Water Table**	--	--	--	--	--	--	--	--	--	--	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**
129	**MW-16WT**	**9/21/2022**	**1184.7**	**1187.41**	**75.0**	**10.0**	**1109.7 - 1119.7**	**Perched Water Table**	--	--	--	--	--	--	--	--	--	--	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**
131	**MW-16**	**8/25/2022**	**1184.3**	**1186.92**	**97.0**	**5.0**	**1087.3 - 1092.3**	**Piezometer/Undefined**	--	--	--	--	--	--	--	--	--	--	**1093.09***	**1101.68**	**1102.48**	**1104.29**	**1104.38**	**1107.62**
133	**MW-17WT**	**9/26/2022**	**1196.4**	**1199.18**	**92.0**	**10.0**	**1104.4 - 1114.4**	**Perched Water Table**	--	--	--	--	--	--	--	--	--	--	**1116.64**	**1117.78**	**FROZEN**	**1121.62**	**1124.88**	**1122.04**

Notes:

bgs - Below ground surface.

NM - Not measured.

-- - Data not available due to monitoring point not yet installed.

* - Groundwater elevation not representative due to well still stablizing post-well development.

BOLD -Monitoring well or piezometer used in monitoring of the proposed landfill expansion area.

Table 5-5
In-Field Hydraulic Conductivity Testing for the Landfill Property
Vernon County Landfill - Proposed Eastern Expansion

Well Name	Screen Interval Elevation (feet NAVD)	Well Type/ Groundwater Zone	Geologic Description of Screened Interval	Year Completed	Method	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
Perched Water Table Wells							
MW-1PR	1119.9 - 1134.9	Perched Water Table	sandy dolostone to dolomitic sandstone	2003	Bouwer-Rice	5.97E-03	16.93
MW-2P	1128.0 - 1138.0	Perched Water Table	dolostone, hard	2023	Bouwer-Rice	1.64E-03	4.64
MW-4P	1138.3 - 1148.3	Perched Water Table	dolostone, hard	2003	Bouwer-Rice	5.93E-03	16.82
MW-5A	1122.9 - 1137.9	Perched Water Table	dolostone, hard	1989	NA	3.64E-04	1.03
MW-9	1130.7 - 1145.7	Perched Water Table	dolostone with occasional small vugs	2003	Bouwer-Rice	1.18E-02	33.54
MW-12	1119.9 - 1134.9	Perched Water Table	dolostone with occasional small vugs	2023	Bouwer-Rice	1.18E-03	3.34
MW-13P	1122.1 - 1137.1	Perched Water Table	dolostone with occasional small vugs	2003	Bouwer-Rice	3.28E-03	9.29
MW-14WT	1141.2 - 1156.2	Perched Water Table	dolostone	2023	Bouwer-Rice	9.94E-03	28.18
MW-17WT	1104.4 - 1114.4	Perched Water Table	clayey sandstone	2023	Bouwer-Rice	2.43E-05	0.07
					Average	4.46E-03	12.65
					Geometric Mean	1.83E-03	5.20
					Minimum	2.43E-05	0.07
					Maximum	1.18E-02	33.54
Regional Water Table Wells							
MW-1	1078.5 - 1088.5	Regional Water Table	dolostone, hard	1988	NA	1.86E-04	0.53
MW-1R	1082.6 - 1097.6	Regional Water Table	dolostone, hard	2023	Bouwer-Rice	6.67E-02	189.18
MW-2	1078.3 - 1088.3	Regional Water Table	dolostone, hard	1988	NA	4.63E-04	1.31
MW-5	1072.6 - 1082.6	Regional Water Table	dolostone, hard	1988	NA	2.62E-04	0.74
MW-14	1061.4 - 1076.4	Regional Water Table	fractured dolostone and sandy dolostone	2003	Bouwer-Rice	1.39E-02	39.48
					Average	1.63E-02	46.25
					Geometric Mean	1.84E-03	5.21
					Minimum	1.86E-04	0.53
					Maximum	6.67E-02	189.18
Piezometers							
MW-1RZ	1057.5 - 1062.5	Piezometer, Upper Zone	sandy dolostone to dolomitic sandstone	2003	Bouwer-Rice	3.07E-02	87.11
MW-3	1053.2 - 1058.2	Piezometer, Upper Zone	dolostone, hard	2003	Bouwer-Rice	1.67E-03	4.73
MW-6	1025.7 - 1030.7	Piezometer, Lower Zone	sandy dolostone	2003	Bouwer-Rice	1.59E-03	4.51
MW-7	1023.5 - 1028.5	Piezometer, Lower Zone	sandy dolostone with sandstone and shale interbeds	2003	Bouwer-Rice	1.05E-02	29.81
MW-8R	1056.3 - 1071.3	Piezometer, Upper Zone	sandy dolostone with sandstone interbeds	2003	Bouwer-Rice	3.19E-03	9.05
MW-10	1034.0 - 1039.0	Piezometer, Lower Zone	dolomitic sandstone to sandy dolostone	2003	Bouwer-Rice	2.01E-03	5.71
MW-11	1056.0 - 1071.0	Piezometer, Upper Zone	sandy dolostone to dolomitic sandstone	2003	Bouwer-Rice	2.19E-04	0.62
MW-14Z	1036.7 - 1041.7	Piezometer, Lower Zone	silty dolomitic sandstone	2003	Bouwer-Rice	1.18E-03	3.34
MW-16	1087.3 - 1092.3	Piezometer/Undefined	sandy dolostone	2023	Bouwer-Rice	3.71E-04	1.05
					Average	5.72E-03	16.21
					Geometric Mean	2.01E-03	5.69
					Minimum	2.19E-04	0.62
					Maximum	3.07E-02	87.11
Summary of All Hydraulic Conductivity Values							
					Average	7.53E-03	21.35
					Geometric Mean	1.90E-03	5.39
					Minimum	2.43E-05	0.07
					Maximum	6.67E-02	189.18

Notes:
cm/sec - centimeters per second.
ft/day - feet per day.
NA - Not available due to no description present on soil boring log.

Table 5-6
Vertical Hydraulic Gradients
Vernon County Landfill - Proposed Eastern Expansion

Well Name	TOC Elevation (feet NAVD)	Ground Elevation (feet NAVD)	Screen Bottom Elevation (feet NAVD)	Screen Top Elevation (feet NAVD)	Screen Interval Elevation (feet NAVD)	Vertical Gradient by Date																Average	Direction
						3/14/2018	9/10/2018	3/11/2019	9/9/2019	3/9/2020	9/14/2020	3/1/2021	9/1/2021	3/1/2022	9/22/2022	12/20/2022	1/24/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023		
Perched Water Table vs Regional Water Table																							
MW-1P	1238.41	1236.4	1125.4	1135.4	1125.4 - 1135.4	33.220	32.870	29.420	28.230	29.510	30.420	35.090	38.090	39.570	40.950	40.320	42.090	42.080	41.230	39.790	38.210		
MW-1	1238.11	1236.4	1078.5	1088.5	1078.5 - 1088.5	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900	46.900		
MW-1P/MW-1						0.708	0.701	0.627	0.602	0.629	0.649	0.748	0.812	0.844	0.873	0.860	0.897	0.897	0.879	0.848	0.815	0.774	**Downward**
MW-1PR	1247.61	1245.0	1119.9	1134.9	1119.9 - 1134.9	36.170	35.650	32.110	31.080	32.430	33.190	38.300	40.760	42.420	43.550	43.220	43.440	44.610	43.780	42.590	40.510		
MW-1R	1247.25	1244.6	1082.6	1097.6	1082.6 - 1097.6	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300	37.300		
MW-1PR/MW-1R						0.970	0.956	0.861	0.833	0.869	0.890	1.027	1.093	1.137	1.168	1.159	1.165	1.196	1.174	1.142	1.086	1.045	**Downward**
MW-2P	1254.88	1252.5	1128.0	1138.0	1128 - 1138	47.100	47.810	45.330	45.180	45.710	45.900	48.310	49.810	51.540	52.870	52.620	53.220	53.350	52.640	52.470	50.760		
MW-2	1254.35	1252.5	1078.3	1088.3	1078.3 - 1088.3	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700	49.700		
MW-2P/MW-2						0.912	0.912	0.912	0.909	0.920	0.924	0.972	1.002	1.037	1.064	1.059	1.071	1.073	1.059	1.056	1.021	0.994	**Downward**
MW-5A	1225.81	1224.0	1122.9	1137.9	1122.9 - 1137.9	52.750	52.850	51.580	52.500	51.790	52.040	51.750	51.500	51.580	51.690	53.320	51.760	51.690	51.980	52.080	50.620		
MW-5	1225.32	1223.3	1072.6	1082.6	1072.6 - 1082.6	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800	52.800		
MW-5A/MW-5						0.999	1.001	0.977	0.994	0.981	0.986	0.980	0.975	0.977	0.979	1.010	0.980	0.979	0.984	0.986	0.959	0.984	**Downward**
Regional Water Table vs Piezometer																							
MW-1R	1247.25	1244.6	1082.6	1097.6	1082.6 - 1097.6	0.390	0.390	0.440	0.390	0.430	0.450	0.380	0.390	0.530	0.440	2.520	1.490	0.460	0.520	1.410	0.600		
MW-1RZ	1245.45	1244.0	1057.5	1062.5	1057.5 - 1062.5	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100	30.100		
MW-1R/MW-1RZ						0.013	0.013	0.015	0.013	0.014	0.015	0.013	0.013	0.018	0.015	0.084	0.050	0.015	0.017	0.047	0.020	0.023	**Downward**
MW-14	1249.69	1247.5	1061.4	1076.4	1061.4 - 1076.4	2.760	3.940	2.880	5.530	3.560	2.890	2.670	4.570	2.980	1.430	2.430	1.630	1.450	2.140	1.950	4.880		
MW-14Z	1250.22	1247.5	1036.7	1041.7	1036.7 - 1041.7	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700	29.700		
MW-14/MW-14Z						0.093	0.133	0.097	0.186	0.120	0.097	0.090	0.154	0.100	0.048	0.082	0.055	0.049	0.072	0.066	0.164	0.100	**Downward**
Upper Piezometer vs Lower Piezometer																							
MW-3	1235.25	1233.0	1053.2	1058.2	1053.2 - 1058.2	6.950	5.330	6.900	6.960	6.540	6.690	6.670	5.790	5.390	5.300	5.880	6.180	6.340	6.580	6.940	7.810		
MW-6	1235.37	1233.0	1025.7	1030.7	1025.7 - 1030.7	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500	27.500		
MW-3/MW-6						0.253	0.194	0.251	0.253	0.238	0.243	0.243	0.211	0.196	0.193	0.214	0.225	0.231	0.239	0.252	0.284	0.232	**Downward**
MW-8R	1258.84	1256.1	1056.3	1071.3	1056.3 - 1071.3	8.470	7.110	8.590	8.190	8.100	8.040	7.860	6.480	6.080	5.910	7.240	6.920	5.700	0.810	6.440	9.380		
MW-7	1258.03	1255.7	1023.5	1028.5	1023.5 - 1028.5	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800	37.800		
MW-8R/MW-7						0.224	0.188	0.227	0.217	0.214	0.213	0.208	0.171	0.161	0.156	0.192	0.183	0.151	0.021	0.170	0.248	0.184	**Downward**
MW-11	1218.56	1216.4	1056.0	1071.0	1056 - 1071	5.110	2.630	5.160	5.400	2.760	5.120	3.300	3.160	5.040	3.510	3.130	5.070	6.610	4.930	8.580	5.410		
MW-10	1217.52	1215.6	1034.0	1039.0	1034 - 1039	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000	27.000		
MW-11/MW-10						0.189	0.097	0.191	0.200	0.102	0.190	0.122	0.117	0.187	0.130	0.116	0.188	0.245	0.183	0.318	0.200	0.173	**Downward**

Notes:

** - Well or piezometer was installed during 2022

-- - Data not available.

Table 5-7
Existing NR140 Exemptions for Public Health/Public Welfare Parameters
Vernon County Landfill - Proposed Eastern Expansion

Parameter	Well ID	Public Health (NR140.10)		Public Welfare (NR140.12)	
		ES	PAL	ES	PAL
Iron	MW-1PR			X	
	MW-1R				X
	MW-3			X	
	MW-5A			X	
	MW-7			X	
	MW-9			X	
	MW-12			X	
	P-1			X	
Fluoride	MW-2		X		
	MW-2P		X		
	MW-3		X		
	MW-4P		X		
	MW-5A		X		
	MW-6		X		
	MW-8R		X		
	MW-11		X		
	MW-12		X		
Manganese	MW-14		X		
Nitrate+Nitrite (as N)	MW-1RZ		X		
	MW-13P		X		
	MW-14		X		
	MW-14Z	X			

Notes:

ES - Enforcement Standard.

PAL - Preventative Action Limit.

Table 5-8
Proposed NR140 Exemptions for Public Health/Public Welfare Parameters
Vernon County Landfill - Proposed Eastern Expansion

Parameter	Well ID	Public Health (NR140.10)		Public Welfare (NR140.12)	
		ES	PAL	ES	PAL
Arsenic	MW-14WT		X		
Manganese	MW-14WT	X			
Nitrate+Nitrite (as N)	MW-6		X		

Notes:

ES - Enforcement Standard.

PAL - Preventative Action Limit.

Table 6-1
Waste Characterization
Vernon County Landfill - Proposed Eastern Expansion

Year	WDNR Waste Category										Total
	Category 1		Category 5		Category 19		Category 25		Category 28		
	Municipal Solid Waste		POTW Sludges		Fee Exempt Waste Used for Daily Cover		Construction & Demolition Waste		Waste Generated by Natural Disaster		
	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons
2018	12,337	69.4%	83	0.5%	283	1.6%	3,295	18.5%	1,784	10.0%	17,782
2019	18,897	93.6%	0	0.0%	0	0.0%	1,290	6.4%	0	0.0%	20,187
2020	19,817	94.7%	0	0.0%	0	0.0%	1,119	5.3%	0	0.0%	20,936
2021	17,706	96.2%	0	0.0%	0	0.0%	691	3.8%	0	0.0%	18,397
2022	16,266	93.9%	0	0.0%	136	0.8%	925	5.3%	0	0.0%	17,327
Average (Last 5 Years)	**17,005**	**89.6%**	**17**	**0.1%**	**84**	**0.5%**	**1,464**	**7.9%**	**357**	**2.0%**	**18,926**

Notes:

1. Waste tonnage data obtained from WDNR annual tonnage reports (https://dnr.wisconsin.gov/topic/Landfills/Fees.html).

2. Other WDNR waste categories which had zero tonnage for the previous 5 years are excluded from the table for clarity.

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Leachate Characterization
Vernon County Landfill - Proposed Eastern Expansion

Analytical Parameter	Active Landfill [1] License No. 3268
Volatile Organic Compounds	
1,1,1,2-Tetrachloroethane (Ug/L)	ND
1,1,1-Trichloroethane (Ug/L)	ND
1,1,2,2-Tetrachloroethane (Ug/L)	ND
1,1,2-Trichloroethane (Ug/L)	ND
1,1-Dichloroethane (Ug/L)	ND
1,1-Dichloroethylene (Ug/L)	ND
1,1-Dichloropropene (Ug/L)	ND
1,2,3-Trichlorobenzene (Ug/L)	ND
1,2,3-Trichloropropane (Ug/L)	ND
1,2,4,5-Tetrachlorobenzene (Ug/L)	ND
1,2,4-Trichlorobenzene (Ug/L)	ND
1,2,4-Trimethylbenzene (Ug/L)	ND - 6.3
1,2-Dibromo-3-Chloropropane (Ug/L)	ND
1,2-Dibromoethane(Edb) (Ug/L)	ND
1,2-Dichloroethane (Ug/L)	ND
1,2-Dichloropropane (Ug/L)	ND
1,2-Diphenylhydrazine (Ug/L)	ND
1,3,5-Trimethylbenzene (Ug/L)	ND
1,3-Dichloropropane (Ug/L)	ND
1-Methylnaphthalene (Ug/L)	ND - 8.3
2,2-Dichloropropane (Ug/L)	ND
2,3,4,6-Tetrachlorophenol (Ug/L)	ND
2,4,5-Trichlorophenol (Ug/L)	ND
2,4,6-Trichlorophenol (Ug/L)	ND
2,4-Dichlorophenol (Ug/L)	ND
2,4-Dimethylphenol (Ug/L)	ND
2,4-Dinitrophenol (Ug/L)	ND
2,4-Dinitrotoluene (Ug/L)	ND
2,6-Dichlorophenol (Ug/L)	ND
2,6-Dinitrotoluene (Ug/L)	ND
2-Chloronaphthalene (Ug/L)	ND
2-Chlorophenol (Ug/L)	ND
2-Hexanone (Ug/L)	ND - 110
2-Methylnaphthalene (Ug/L)	ND - 0.51
2-Nitroaniline (Ug/L)	ND
2-Nitrophenol (Ug/L)	ND
3,3'-Dichlorobenzidine (Ug/L)	ND
3-Nitroaniline (Ug/L)	ND
4,6-Dinitro-O-Cresol Ug/L)	ND
4-Bromophenyl Phenyl Ether L (Ug/L)	ND
4-Chlorophenylphenyl Ether (Ug/L)	ND
4-Methyl-2-Pentanone(Mibk) (Ug/L)	ND
4-Nitroaniline (Ug/L)	ND
4-Nitrophenol (Ug/L)	ND
Acenaphthene (Ug/L)	ND
Acenaphthylene (Ug/L)	ND
Acetone (Ug/L)	ND - 720
Acetophenone (Ug/L)	ND - 0.88
Aniline (Ug/L)	ND
Anthracene (Ug/L)	ND
Benz(A)Anthracene (Ug/L)	ND
Benzene (Ug/L)	ND - 5.7
Benzidine (Ug/L)	ND
Benzo(A)Pyrene (Ug/L)	ND
Benzo(B)Fluoranthene (Ug/L)	ND
Benzo(Ghi)Perylene (Ug/L)	ND
Benzo(K)Fluoranthene (Ug/L)	ND
Benzyl Alcohol (Ug/L)	ND
Bis(2-Chloroethoxy) Methane (Ug/L)	ND
Bis(2-Chloroethyl) Ether (Ug/L)	ND
Bis(2-Chloroisopropyl) Ether (Ug/L)	ND
Bis(2-Ethylhexyl) Phthalate (Ug/L)	ND - 1.1
Bromobenzene (Ug/L)	ND
Bromochloromethane (Ug/L)	ND
Bromodichloromethane (Ug/L)	ND
Bromomethane (Ug/L)	ND - 9.2
Butyl Benzyl Phthalate (Ug/L)	ND

Table 6-2
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Leachate Characterization
Vernon County Landfill - Proposed Eastern Expansion

Analytical Parameter	Active Landfill [1] License No. 3268
Volatile Organic Compounds Continued	
Butylbenzene, N- (Ug/L)	ND
Butylbenzene, Sec- (Ug/L)	ND
Butylbenzene, Tert- (Ug/L)	ND
Carbazole (Ug/L)	ND - 1.5
Carbon Disulfide (Ug/L)	ND
Carbon Tetrachloride (Ug/L)	ND
Chlorobenzene (Ug/L)	ND - 7.2
Chloroethane (Ug/L)	ND
Chloroform (Ug/L)	ND
Chloromethane (Ug/L)	ND
Chrysene (Ug/L)	ND
Cis-1,2-Dichloroethene (Ug/L)	ND
Cis-1,3-Dichloropropene (Ug/L)	ND
Cresol, M & P-, (Ug/L)	ND - 73
Dibenz(A,H)Anthracene (Ug/L)	ND
Dibenzofuran (Ug/L)	ND
Dibromochloromethane (Ug/L)	ND
Dibromomethane (Ug/L)	ND
Dichlorodifluoromethane (Ug/L)	ND
Dichloromethane (Ug/L)	ND - 26
Diethyl Phthalate (Ug/L)	ND - 3.2
Diisopropyl Ether (Ug/L)	ND
Dimethyl Phthalate (Ug/L)	ND
Di-N-Butyl Phthalate (Ug/L)	ND - 0.81
Di-N-Octyl Phthalate (Ug/L)	ND
Ethylbenzene (Ug/L)	ND - 17
Fluoranthene (Ug/L)	ND
Fluorene (Ug/L)	ND
Fluorotrichloromethane (Ug/L)	ND
Hexachlorobenzene (Ug/L)	ND
Hexachlorobutadiene (Ug/L)	ND
Hexachlorocyclopentadiene (Ug/L)	ND
Hexachloroethane (Ug/L)	ND
Hexachloropropene (Ug/L)	ND
Indeno(1,2,3-Cd)Pyrene (Ug/L)	ND
Isophorone (Ug/L)	ND
Isopropylbenzene (Ug/L)	ND
M-Dichlorobenzene (Ug/L)	ND - 4.5
Methyl Ethyl Ketone (Mek) (Ug/L)	ND - 990
Methyl Tert-Butyl Ether (Mtbe) (Ug/L)	ND
Naphthalene (Ug/L)	ND - 7.2
Nitrobenzene (Ug/L)	ND
N-Nitrosodimethylamine (Ug/L)	ND
N-Nitrosodi-N-Propylamine (Ug/L)	ND
N-Nitrosodiphenylamine (Ug/L)	ND
N-Nitrosopyrrolidine (Ug/L)	ND
N-Propylbenzene (Ug/L)	ND
O-Chlorotoluene (Ug/L)	ND
O-Cresol (2-Methylphenol) (Ug/L)	ND - 3.7
O-Dichlorobenzene (Ug/L)	ND
P-Chloroaniline (Ug/L)	ND
P-Chloro-M-Cresol (Ug/L)	ND
P-Chlorotoluene (Ug/L)	ND
P-Dichlorobenzene (Ug/L)	ND - 9.2
Pentachlorophenol (Pcp) (Ug/L)	ND
Phenanthrene (Ug/L)	ND
Phenol (Ug/L)	ND
P-Isopropyltoluene (Ug/L)	ND - 6.7
Pyrene (Ug/L)	ND
Pyridine (Ug/L)	ND
Styrene (Ug/L)	ND
Tetrachloroethylene (Ug/L)	ND
Tetrahydrofuran (Ug/L)	180 - 410
Toluene (Ug/L)	ND - 17
Trans-1,2-Dichloroethene, Total (Ug/L)	ND
Trans-1,3-Dichloropropene (Ug/L)	ND
Tribromomethane (Ug/L)	ND
Trichloroethylene (Tce) (Ug/L)	ND
Vinyl Chloride (Ug/L)	ND - 2.6
Xylene, O, M & P-, (Ug/L)	ND - 23

Table 6-2
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Leachate Characterization
Vernon County Landfill - Proposed Eastern Expansion

Analytical Parameter	Active Landfill [1] License No. 3268
Inorganics	
Alkalinity, Carbonate (Mg/L As Caco3)	--
Alkalinity, Total (Mg/L As Caco3)	3600 - 5900
Alkalinity, Total Filtered (Mg/L As Caco3)	--
Antimony, Total (Ug/L Sb)	--
Arsenic, Dissolved (Ug/L As)	--
Arsenic, Total (Ug/L As)	--
Barium, Total (Ug/L Ba)	--
Beryllium, Total (Ug/L Be)	--
Biochemical Oxygen Demand (Mg/L, 5 Day - 20Deg C)	65 - 440
Cadmium, Dissolved (Ug/L Cd)	--
Cadmium, Total (Ug/L Cd)	ND - 0.78
Calcium, Total (Mg/L Ca)	--
Chemical Oxygen Demand, Filtered (Mg/L)	--
Chemical Oxygen Demand, Unfiltered (Mg/L)	770 - 2200
Chloride, Total Or Dissolved (Mg/L Cl)	1000 - 2300
Chromium, Total (Ug/L Cr)	--
Copper, Total (Ug/L Cu)	--
Cyanide, Total (Mg/L Cn)	--
Fluoride, Dissolved (Mg/L F)	--
Fluoride, Total (Mg/L F)	--
Hardness, Calcium (Ca) (Mg/L As Caco3)	--
Hardness, Total (Mg/L As Caco3)	356 - 877
Hardness, Total, Filtered (Mg/L As Caco3)	--
Iron, Dissolved (Mg/L Fe)	--
Iron, Total (Mg/L Fe)	ND - 13
Lead, Dissolved (Ug/L Pb)	--
Lead, Total (Ug/L Pb)	ND - 5.3
Magnesium, Total (Mg/L Mg)	--
Manganese, Total (Ug/L Mn)	845 - 1840
Mercury, Dissolved (Ug/L Hg)	--
Mercury, Total (Ug/L Hg)	ND - 0.38
Nickel, Total (Ug/L Ni)	--
Nitrogen, Ammonia, Total (Mg/L As N)	120 - 970
Nitrogen, Kjeldahl, Total (Mg/L As N)	540 - 970
Phosphate, Total (Mg/L As Po4)	--
Phosphorus, Total (Mg/L P)	--
Potassium, Total (Mg/L K)	--
Selenium, Total (Ug/L Se)	--
Silver, Total (Ug/L Ag)	--
Sodium, Dissolved (Mg/L Na)	--
Sodium, Total (Mg/L Na)	496 - 1515
Solids, Total Suspended (Mg/L)	4 - 110
Sulfate, Dissolved (Mg/L So4)	--
Sulfate, Total (Mg/L So4)	2 - 34
Sulfide, Dissolved (Mg/L S)	--
Sulfide, Total (Mg/L S)	--
Thallium, Total (Ug/L Tl)	--
Zinc, Total (Ug/L Zn)	--
Field Parameters	
Ph, Field (Standard Units)	6.52 - 8.42
Specific Conductance, Field (Umho/Cm @ 25C)	1211 - 14700
Temperature, Water (Degrees Centigrade)	8.96 - 21.38

Notes:

(1) - Vernon County leachate sampling and analysis range results, 2018 - 2022.

ND - Value is below the limit of reporting.

-- - Parameter not analyzed.

Table 6-3
Estimated Leachate Generation Rates for Worst Case Closure
Vernon County Landfill - Proposed Eastern Expansion

Landfill Cover Status	Area (acres)	Infiltration[1] (inches/year)	Leachate Generation Rate (gpm)
Worst-Case Scenario			
Open Area			
Closure Area C-2	4.64	6	1.44
Closure Area C-3	4.94	6	1.53
sum	9.58	6	2.97
Closed			
Closure Area C-1	5.00	1	0.26
sum	5.00	1	0.26
Total	**14.58**	**Varies**	**3.23**
Final Closure[2]			
Closed	14.58	1	0.75
Total	**14.58**	**1**	**0.75**

Notes:

1. Leachate Generation Rate (gallons/min) = [Area (ac) x Infiltration (in/yr) x 43,560 (sf/ac) x 7.48 (gal/cf)] / [12 (in/ft) x 525,600 (min/year)].

2. 'Final Closure includes all closure areas, C-1, C-2, and C-3.

Table 8-1
Preliminary Soil Balance
Vernon County Landfill - Proposed Eastern Expansion

Phase	Topsoil (CY)	Rooting Zone (CY)	Liner/Cap Clay (CY)	Sand Drainage Layer (CY)	Rock Drainage Layer (CY)	Earth Work		
						Common Excavation (CY)	Common Fill (CY)	Net (CY)
On-Site Clay Borrow (In-situ)								
Clay Borrow Area A (northwest)			119,190					
Clay Borrow Area B (southwest)			28,580					
Sum			147,770					
Construction Event								
Phase VII			(12,370)		(2,490)	8,699	(95,192)	(86,500)
Phase VIII			(12,730)		(2,510)	8,986	(26,074)	(17,090)
Phase IX			(12,710)		(2,670)	11,841	(16,106)	(4,270)
C-1 Closure	(4,880)	(18,770)	(17,050)	(8,960)				
C-2 Closure	(4,050)	(15,880)	(15,120)	(7,750)				
C-3 Closure	(4,250)	(16,710)	(16,090)	(8,200)				
sum	**(13,180)**	**(51,360)**	**61,700**	**(24,910)**	**(7,670)**		**sum**	**(107,860)**

Notes:

1 - Existing soil stockpiles on-site not considered, since stockpiles are currently for daily cover.

2 - Clay Borrow areas not estimated for potential topsoil and rooting zone layer soils present.

3 - Clay Borrow Area A had an initial estimated acceptable clay volume of 315,300 cy with an estimated 119,190 cy remaining.

4 - Clay Borrow Area B had an initial estimated acceptable clay volume of 69,750 cy with an estimated 28,850 cy remaining.

5 - Quantities shown as "(X,XXX)" indicate a negative preliminary material balance or deficit.

Table 10-1
Statutory Authority Summary
Vernon County Landfill - Proposed Eastern Expansion

Statutes	Statute Authority	General Description
§289, Wisconsin State Statutes	WDNR	Solid Waste
1989 Wisconsin Act 335	WDNR	Recycling Laws
Wisconsin Act 31	WDNR	40-Year Period for Closure and Long-term Care Costs
Wisconsin Act 93	WDNR	Landfill Needs
NR 103, WAC	WDNR	Wetland Exemption
NR 140, WAC	WDNR	Water Quality
NR 141, WAC	WDNR	Groundwater Monitoring Well Requirements
NR 151 and NR 216, WAC	WDNR	Stormwater discharge and quality
NR 299, WAC	WDNR	State Water Quality Certification
NR 406, WAC	WDNR	Air Construction Permit
NR 407, WAC	WDNR	Air Operating Permit
NR 445, WAC	WDNR	Control of Hazardous Air Pollutants
NR 500 through NR 520, WAC	WDNR	FR and POO Approval
NR 812, WAC	WDNR	Drinking Water
Sections 401 and 404 CWA	U.S. Army Corps of Engineers	Water Quality
40CFR258.71, 258.72	EPA	Financial Assurance for Closure and Post-Closure
40CFR258.10	FAA	Airport Safety
Local	Town of Viroqua	Code of Ordinances
Local	Town of Viroqua	Siting Agreement

Table 10-2
Potential Physical Impacts due to Expansion
Vernon County Landfill - Proposed Eastern Expansion

Impact	Adverse Effect	Beneficial Effect	Proposed Mitigation
Odors	Odors from MSW and LFG	Beneficial use of LFG	Proper waste placement and cover approaches
			LFG system optimization
Windblown Debris	Nuisance and visually unappealing	None	Fencing, waste covering, utilization of external core berms
Dust	Continued dust from operations and construction activities	None	Water roads and utilize gravel haul roads
Emissions	Fugitive LFG and emissions from combustion engines	None	LFG system optimization and maintenance of equipment
Changes to Landscape	Change in topography	None	Remaining topography and landscaping plan will mitigate view shed (Host Agreement)
	Removal of trees		
Noise	Continued noise from operations	None	Compliance with Host Agreement
			Maintain equipment

Table 10-3
Potential Biological Impacts due to Expansion
Vernon County Landfill - Proposed Eastern Expansion

Impact	Adverse Effect	Beneficial Effect	Proposed Mitigation
Grubbing, excavation, construction	Loss/Distrubance of existing plant and animal habitat	Diversion of habitat away from landfill operations	Vegetation restoration
			Improve habitat for migration away from landfill operations
End Use Plan	Delay implementation of final end use	Utilization of property for recreation purposes	Implementation of land use plan
		Provides green space for plant and animal habitat	Ongoing outreach with community regarding goals and vision

Table 11-1
Remaining Site Capacity and Service Area Population Characteristics
Vernon County Landfill - Proposed Eastern Expansion

Site Name	Service Area[1]	Remaining Site Capacity as of January 2023[2] (CY)	Service Area Population 2020 Census[3]	Service Area Population 2023 Estimate[3]	Population Numeric Change	Population Percent Change	Population Annual Growth Rate
Vernon County Landfill	Vernon County	33,769	30,714	30,914	200	0.65%	0.22%

Notes:

(1) The service area for Vernon County Landfill, through local ordinance, consists of Vernon County only.

(2) Estimated site capacity data was collected from WDNR 2022 Wisconsin Municipal and Industrial Waste Landfill Tonnage Report - Capacity as of Jan. 2023 (http://dnr.wi.gov/topic/Landfills/Fees.html).

(3) Population data from Wisconsin Department of Administration (DOA) Wisconsin Demographic Services Center "January 1, 2023 Preliminary Population Estimates" https://doa.wi.gov/Pages/LocalGovtsGrants/Population_Estimates.aspx.

Table 11-2
Historical Waste Acceptance and Annual Air Space Consumed
Vernon County Landfill - Proposed Eastern Expansion

Year	Waste Accepted - All[1] (Tons)	Estimated Volume Consumed[2] (CY)	Annual Waste Demand Growth (%)
2007[3]	14,461	19,281	--
2008	15,544	20,725	7.49%
2009	14,967	19,956	-3.71%
2010	14,958	19,944	-0.06%
2011	16,806	22,408	12.35%
2012	15,321	20,428	-8.84%
2013	16,972	22,629	10.78%
2014	17,377	23,169	2.39%
2015	16,283	21,711	-6.30%
2016	17,420	23,227	6.98%
2017	15,991	21,321	-8.20%
2018	17,783	23,711	11.21%
2019	20,187	26,916	13.52%
2020	20,937	27,916	3.72%
2021	18,397	24,529	-12.13%
2022	17,327	23,103	-5.82%
Mean Year to Year	**16,920.69**	**22,560.92**	**1.56%**
Median Year to Year	**16,889.00**	**22,518.67**	**2.39%**
Avg Year to Year Past 5 Yrs	**18,926.20**	**25,234.93**	**2.10%**
Growth Previous 5 Years [4]	**--**	**--**	**1.62%**

Notes:

(1) Tonnage intake rates from WDNR Tonnage Reports. (http://dnr.wi.gov/topic/Landfills/Fees.html). Includes all waste types.

(2) Volume consumed estimated using a waste density of 1,500 lb/cy per Draft WDNR Landfill Needs and Site Life Guidance Doc. (2004).

(3) The year 2007 represents when all waste types were diverted to the MSW Landfill after the small sized C&D site closed.

(4) Growth rate calculated represents the compound annual growth rate.

Table 11-3
Statewide Waste Disposal Rates
Vernon County Landfill - Proposed Eastern Expansion

Year	Wisconsin Population[1]	Total Volume of Waste Disposed In Wisconsin MSW & Industrial Landfills			Disposal Rate								
		MSW[2]	Non-MSW[3]	Total	MSW[2]	Non-MSW[3]	Total	MSW[2]	Non-MSW[3]	Total	MSW[2][4]	Non-MSW[3][4]	Total
		(tons)			(tons/capita/year)			(lbs/cap/day)			(CY/year)		
2010	5,686,986	4,153,036	4,116,909	8,269,945	0.73	0.72	1.45	4.00	3.97	7.97	5,537,381	5,489,212	11,026,593
2011	5,694,236	4,040,494	4,003,406	8,043,900	0.71	0.70	1.41	3.89	3.85	7.74	5,387,325	5,337,875	10,725,200
2012	5,703,525	3,930,734	4,779,108	8,709,842	0.69	0.84	1.53	3.78	4.59	8.37	5,240,979	6,372,144	11,613,123
2013	5,717,110	3,908,613	3,941,357	7,849,970	0.68	0.69	1.37	3.75	3.78	7.52	5,211,484	5,255,143	10,466,627
2014	5,732,981	3,977,291	4,187,777	8,165,068	0.69	0.73	1.42	3.80	4.00	7.80	5,303,055	5,583,703	10,886,757
2015	5,753,324	3,991,389	4,228,574	8,219,963	0.69	0.73	1.43	3.80	4.03	7.83	5,321,852	5,638,099	10,959,951
2016	5,775,120	4,108,436	4,470,469	8,578,905	0.71	0.77	1.49	3.90	4.24	8.14	5,477,915	5,960,625	11,438,540
2017	5,783,278	4,222,091	4,234,245	8,456,336	0.73	0.73	1.46	4.00	4.01	8.01	5,629,455	5,645,660	11,275,115
2018	5,816,231	4,286,143	4,507,659	8,793,802	0.74	0.78	1.51	4.04	4.25	8.28	5,714,857	6,010,212	11,725,069
2019	5,843,443	4,421,479	4,277,037	8,698,516	0.76	0.73	1.49	4.15	4.01	8.16	5,895,305	5,702,716	11,598,021
2020	5,893,718	4,350,249	3,603,942	7,954,191	0.74	0.61	1.35	4.04	3.35	7.40	5,800,332	4,805,256	10,605,588
2021	5,901,473	4,478,130	3,703,388	8,181,518	0.76	0.63	1.39	4.16	3.44	7.60	5,970,840	4,937,851	10,908,691
2022	5,949,155	4,398,873	4,051,449	8,450,322	0.74	0.68	1.42	4.05	3.73	7.78	5,865,164	5,401,932	11,267,096
Average 2018-2022 (Last 5 Years)					**0.75**	**0.69**	**1.43**	**4.09**	**3.76**	**7.84**	**5,849,300**	**5,371,593**	**11,220,893**

Notes:

(1) Population data from Wisconsin Department of Administration (DOA) Wisconsin Demographic Services Center "January 1, 2022 Final Population Estimates Summary" https://doa.wi.gov/Pages/LocalGovtsGrants/Population_Estimates.aspx.

(2) Category 1 Wastes from WDNR Landfill Tonnage Reports. https://dnr.wisconsin.gov/topic/Landfills/Fees.html.

(3) All other remaining WDNR Waste Categories (i.e., Categories 2 - 6 and 19 - 33). https://dnr.wisconsin.gov/topic/Landfills/Fees.html.

(4) Conversion factor of 1,500 lbs/CY used to calculate an estimated volume.

Table 11-4
Per Capita Service Area Disposal Rate
Vernon County Landfill - Proposed Eastern Expansion

Statewide Average Disposal Rate (2018-2022)[(1)]	1.43	ton/person/yr
Service Area Population (2023)[(2)]	30,914	
Estimated Annual Service Area Disposal	44,250	ton/year
Average Waste Density[(3)]	1,500	lbs./CY
Estimated Annual Service Area Disposal	59,000	CY/year

Notes:

(1) Disposal rate is the average total (MSW and Non-MSW) waste disposed statewide from 2018-2022. Statewide disposal rate calculated in Table 11-3.

(2) Population data from Wisconsin Demographic Services Center.

(3) Volume of waste derived from assumed average waste denstiy of 1,500 lb/cy per Draft WDNR Landfill Needs and Site Life Guidance Doc. (2004).

Table 11-5
Projected Expansion Site Life Based on Historical Waste Acceptance
Vernon County Landfill - Proposed Eastern Expansion

Most Conservative Waste Growth Rate Calculated from Table 11-2: 1.56%

Previous 5 Year Average (2018-2022) Annual Waste Volume: 25,234.93

Year	Historical Waste Disposal Volumes		
	Annual Volume of Waste Accepted[1] (CY)	Available Waste Disposal Capacity as of January of Listed Year[2] (Total)	Available Waste Disposal Capacity (Expansion Only) as of January of Listed Year (CY)
2023	25,628	33,769	--
2024[3]	26,028	438,141	430,000
2025	26,433	412,113	403,972
2026	26,845	385,680	377,539
2027	27,263	358,835	350,694
2028	27,688	331,572	323,431
2029	28,120	303,884	295,743
2030	28,558	275,764	267,623
2031	29,003	247,206	239,066
2032	29,455	218,204	210,063
2033	29,914	188,749	180,608
2034	30,380	158,835	150,694
2035	30,853	128,456	120,315
2036	31,334	97,602	89,461
2037	31,822	66,268	58,127
2038	32,318	34,446	26,305
2039	32,822	2,128	-6,013
2040	33,333	-30,694	-38,835

Notes:

(1) Annual volume of waste accepted based on previous 5 year average (2018-2022) with annual waste volumes increasing by growth rate listed above.

(2) Available waste disposal capacity for 2023 based on 2022 WDNR tonnage report.

(3) Approval of expansion volume assumed to occur in early 2024.

Table 11-6
Remaining Site Life Without Proposed Expansion - Per Capita Method
Vernon County Landfill - Proposed Eastern Expansion

Year	Available Disposal Capacity (CY)	Estimated Disposal[(2)(4)] (CY)	Remaining Years of Disposal Capacity[(3)]
2023[(1)]	33,769	59,000	1
2024	-25,231	59,127	0
2025	-84,358	59,256	-1
2026	-143,614	59,384	-2
2027	-202,998	59,513	-3
2028	-262,510	59,641	-4
2029	-322,152	59,771	-5
2030	-381,922	59,900	-6
2031	-441,822	60,030	-7
2032	-501,852	60,160	-8
2033	-562,012	60,290	-9
2034	-622,302	60,421	-10
2035	-682,723	60,552	-11
2036	-743,274	60,683	-12
2037	-803,957	60,814	-13
2038	-864,771	60,946	-14
2039	-925,717	61,078	-15
2040	-986,795	61,210	-16

Notes:

(1) Available disposal capacity as of January 1, 2023 per 2022 tonnage report, as noted on Table 11-1.

(2) Estimated disposal rate is based on service area population and per capita disposal rate calculated in Table 11-4.

(3) Remaining years of disposal capacity as of January 1 of year shown.

(4) Waste disposal rate increase is commensurate with population growth rate calculated in Table 11-1 (0.22%).

Table 11-7
Projected Site Life With Proposed Expansion - Per Capita Method
Vernon County Landfill - Proposed Eastern Expansion

Year	Available Disposal Capacity (CY)	Estimated Disposal[(2)(4)] (CY)	Remaining Years of Disposal Capacity[(3)]
2023[(1)]	33,769	59,000	1
2024	404,769	59,127	7
2025	345,642	59,256	6
2026	286,386	59,384	5
2027	227,002	59,513	4
2028	167,490	59,641	3
2029	107,848	59,771	2
2030	48,078	59,900	1
2031	-11,822	60,030	0
2032	-71,852	60,160	-1
2033	-132,012	60,290	-2
2034	-192,302	60,421	-3
2035	-252,723	60,552	-4
2036	-313,274	60,683	-5
2037	-373,957	60,814	-6
2038	-434,771	60,946	-7
2039	-495,717	61,078	-8
2040	-556,795	61,210	-9

Notes:

(1) Available disposal capacity as of January 1, 2023 per 2022 tonnage report, as noted on Table 11-1.

(2) Estimated disposal rate is based on service area population and per capita disposal rate calculated in Table 11-4.

(3) Remaining years of disposal capacity as of January 1 of year shown.

(4) Waste disposal rate increase is commensurate with population growth rate calculated in Table 11-1 (0.22%).

Table 11-8
Statewide Landfill Disposal Rate and Remaining Capacity Without New Landfills or Expansions
Vernon County Landfill - Proposed Eastern Expansion

Year	Available Disposal Capacity as of January of Listed Year[1] (CY)	Estimated Disposal[2] (CY)	Remaining Years Of Disposal Capacity
2022	136,427,385	11,267,096	12
2023	127,211,893	11,309,911	11
2024	115,901,982	11,352,889	10
2025	104,549,093	11,396,030	9
2026	93,153,064	11,439,335	8
2027	81,713,729	11,482,804	7
2028	70,230,925	11,526,439	6
2029	58,704,487	11,570,239	5
2030	47,134,248	11,614,206	4
2031	35,520,042	11,658,340	3
2032	23,861,702	11,702,642	2
2033	12,159,060	11,747,112	1
2034	411,948	11,791,751	0

Notes:

(1) Available disposal capacity as of January 1, 2022 and January 1, 2023 per 2022 WDNR tonnage report.

(2) Estimated disposal rate calculated to increase commensurate with State population growth rate of 0.38% beginning with 2022 tonnage data.

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Appendix A

WDNR Completeness Checklists

A-1 – Feasibility Report Completeness Checklist, NR 512
A-2 – Design and Construction Criteria Completeness Checklist, NR 504

A-1 – Feasibility Report Completeness Checklist, NR 512

Feasibility Report Completeness Checklist
Chapter NR 512, Wis. Adm. Code

Revised January 2022

Waste & Materials Management
P.O. Box 7921
Madison, WI 53707-7921

Instructions: This checklist is intended for use by department staff for the review of landfill feasibility reports to determine completeness. This checklist is intended to be used in conjunction with the Design and Construction Criteria Completeness Checklist, Chapter NR 504, Wis. Adm. Code. Applicants may complete this checklist and submit it with a landfill feasibility report to facilitate department review. Please refer to applicable statues and codes for exact requirements.

General Information

Facility Name: Vernon County Landfill

Facility Type: Expansion of an Existing MSW Landfill

Proposed Waste Types: MSW, C&D, special waste

Proposed Total Design Capacity: 427,355 CY (including daily and intermediate covers)

Initial Submittal: Date Received: ____/____/____ Completeness Due: ____/____/____ DNR Response: ____/____/____ (Complete: __ yes __ no)

Addendum # __ Date Received: ____/____/____ Completeness Due: ____/____/____ DNR Response: ____/____/____ (Complete: __ yes __ no)

Addendum # __ Date Received: ____/____/____ Completeness Due: ____/____/____ DNR Response: ____/____/____ (Complete: __ yes __ no)

Addendum # __ Date Received: ____/____/____ Completeness Due: ____/____/____ DNR Response: ____/____/____ (Complete: __ yes __ no)

Addendum # __ Date Received: ____/____/____ Completeness Due: ____/____/____ DNR Response: ____/____/____ (Complete: __ yes __ no)

Has the assigned DNR hydrogeologist started to fill out a ***Feasibility Internal Procedures*** form for this project? **Y** **N**

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
NR 500.05 GENERAL SUBMITTAL REQUIREMENTS.					
(1) Has the adequate review fee specified in s. 520.04 been submitted?	X				Submitted by Vernon County
(2) Has a cover letter detailing the desired action been submitted?	X			Cover Letter	
(3) Have 5 copies (2 Regions, 3 Central Office) been submitted to the department?	X				Per correspondence w/Colin Maus
(4) Are the report and plan sheets submitted under the seals and certifications of a P.E. and P.G.?	X			Certification Page Drawings	
(5) Technical Procedures:					
Were all test procedures specified in the report?	X			Section 5.2, Appendix J	
Were all technical procedures used to investigate the facility current standard procedures?	X			Section 5.2, Appendix J	
Were explanations and reasons given for deviations from the current standard procedures?	X			Section 5.2, Appendix J	
(6) Do all maps, plan sheets, drawings, isometrics, cross-sections, figures, photographs and tables meet the following requirements?					
(a) No larger than 24 inches x 36 inches & no smaller than 8 ½ inches x 11 inches.	✓			Drawings, Appendices	
(b) Appropriate scale to show required detail.	✓			Drawings, Appendices	
(c) Do visuals meet the following requirements? ✓ numbered ✓ legends for all symbols ✓ referenced in the narrative ✓ horizontal & vertical scales ✓ titled ✓ drafting and origination dates	✓			Drawings, Appendices	
(d) Were uniform scales used?	✓			Drawings	
(e) Were north arrows shown?	✓			Drawings	
(f) Was a USGS datum used as basis for all elevations?	✓			Drawings, Appendices	
(g) Do visuals contain a survey grid based upon monuments established in the field and which is referenced to the state plane coordinates?	✓			Drawings	
(h) Is the original topography and a grid system shown on the plan sheets that show construction, operation and closure topography?	✓			Drawings	
(i) Do cross-sections meet the following requirements? ✓ Show survey grid locations, ✓ Reference major plan sheets, ✓ Include a reduced diagram of plan view showing cross-section location.	✓			Drawings11-22	
(7) Was a table of contents provided listing all sections of the submittal?	✓			Report	

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
(8) Was an appendix provided listing the following? ✓ names of all references ✓ all raw data, ✓ testing and sampling procedures ✓ calculations	✓			Appendices I, J, K, L, P	References found in Report Section 13
NR 504.04(3) LOCATIONAL CRITERIA. Does the report indicate that the proposed limits of filling are within:					
(a) 1,000 feet of any navigable lake, pond or flowage not including landfill drainage or sedimentation control structures? __ yes ✓ no __ If yes, was an exemption requested?	✓			Section 7.1.1, Appendices B, F, G	
(b) 300 feet of any navigable river or stream? __ yes ✓ no __ If yes, was an exemption requested?	✓			Section 7.1.2, Appendices B, F, G	
(c) A 100-year flood plain? __ yes ✓ no __ If yes, was an exemption requested?	✓			Section 7.1.3, Appendices B, F, G	
(d) 1,000 feet of the nearest edge of the right-of-way of any state trunk highway, interstate or federal aid primary highway or any public park or state natural area? __ yes ✓ no __ If yes, was a line of site study provided showing that the landfill would not be visible from the road, park or natural area through the use of screening and/or, __ was an exemption requested? Note: If waste may be visible for periods of time even with the use of screening, then an exemption should be requested.	✓			Section 7.1.4, Appendices B, F	
(e) 10,000 feet of the end of an airport runway designed or planned to be designed and used by turbojet aircraft or within 5,000 feet of any airport runway designed for and used by piston type aircraft? __ yes ✓ no Is FAA notification required? ✓ yes __ no Note: If the proposed limits of waste filling would be within 5 miles (for expansions of an existing MSW landfill, initially accepting waste prior to 4/5/2000) or within 6 miles (for new MSW landfills, after 4/5/2000) of the end of the runway of any airport used by turbojet or piston type aircraft, the applicant must provide notice to both the Federal Aviation Administration (FAA) and the affected airport. The report should contain all correspondence related to the notices including any determinations made by the FAA. (Ref. 49 U.S.C. § 44718(d), See FAA Advisory Circular AC 150/5200-34A, dated 1/26/2006)	✓			Section 4.6, Section 7.1.5, Appendices B, F, H	

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
(f) 1,200 feet of any water supply well (i.e. public, private, irrigation or stock water supply wells)? X yes __ no X was an exemption requested? If yes, have the following been provided for each identified well? __ well location __ former and present well owner __ well driller __ well construction log __Has an NR 812 well variance application been submitted? (Note: This is not a feasibility completeness item; however, an NR 812 variance application must be received by the department before an NR 504.04 exemption may be granted.) Note: Exemptions may not be granted if the above information is not provided.	X			Section 1.3.2, Section 7.1.6	Exemption granted within previous Feasibility Determination on June 28, 2004.
(g) 200 feet of a fault that has had displacement in Holocene time? __ yes ✓ no __ If yes, was an exemption requested?	✓			Section 7.1.7, Appendices B, F	
(h) Seismic impact zones? __ yes ✓ no __ If yes, was an exemption requested?	✓			Section 7.1.8, Appendices B, F	
(i) Unstable areas? __ yes ✓ no __ If yes, was an exemption requested?	✓			Section 7.1.8, Appendices B, F	
NR 504.04(4) PERFORMANCE STANDARDS. Does the report indicate that the proposed landfill or any proposed noncommercial soil borrow source(s) will have:					
(a) A significant adverse impact on wetlands? __ yes ✓ no Note: If a significant adverse impact would occur to wetlands (e.g. filling or excavation) then a wetland permit would be required under s. 281.36, Stats. A wetland permit would supersede the NR 103 water quality standards for wetlands. The wetland permit application requires a practicable alternatives analysis, a wetland functional values analysis and a public comment period specific to the wetland permit application. Wetland mitigation may also be required. ___Has a wetland permit been submitted with the feasibility report or has a wetland application been submitted to the department? ✓ Has a wetland delineation and functional values report been submitted with the feasibility report?	✓			Section 7.2.1, Appendices B,G	
(b) A take of an endangered or threatened species in accordance with s. 29.604, Stats? __ yes ✓ no	✓			Section 4.5.3, Section 7.2.2, Appendix B	

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
(c) A detrimental effect on any surface water? __ yes ✓ no Note: Exemptions are not granted.	✓			Section 7.2.3, Appendix B	
(d) A detrimental effect on groundwater quality or will cause or exacerbate an attainment or exceedance of any preventive action limit or enforcement standard at a point of standards application as defined in ch. NR 140? __ yes X no X Has an exemption been requested to the groundwater standards in accordance with ss. NR 507.29 and NR 140.28, Wis. Adm. Code? If an exemption is required, does the feasibility report include: X A list of the specific wells and parameters for which an exemption is being requested. X A discussion of how the criteria listed in s. NR 140.28(2), (3) and (4) are met.	X			Section 1.3.1, Section 5.4.3, Table 5-7, Table 5-8	
(e) The migration and concentration of explosive gases in excess of 25% of the lower explosive limit for such gases at any time? __ yes ✓ no	✓			Section 7.2.5, Section 8.13	
(f) The emission of any hazardous air contaminant exceeding the limitations for those substances contained in s. NR 445.04 or 445.05? __ yes ✓ no	✓			Section 7.2.6, Section 8.13	
NR 512.04 INITIAL SITE REPORT.					
Has the department rendered an initial site report opinion? ✓ yes __ no Date: February 15, 2022	✓			Section 1.4, Appendix B	
Has an optional pre-feasibility report been submitted? __ yes ✓ no Date:			✓		
NR 512.05 GENERAL SUBMITTAL REQUIREMENTS.					
Does the report address all of the department's review comments on the initial site report or any applicable pre-feasibility report?	✓			Section 1.4, Appendix B	
Does the report contain justification for requests for any exemptions to the locational and performance standards listed in s. NR 504.04?	✓			Section 1.3	
For an alternative design to s. NR 504.05 – 504.09 requirements, does the report include an analysis to predict whether the facility will meet or exceed performance standards of s. NR 504.04(4)(d) regarding groundwater quality?			✓		

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
NR 512.06 PROCEDURAL REQUIREMENTS.					
(1) Local approvals: Does the report contain the following:					
✓ Documentation that each affected municipality (towns, villages, cities, and counties) has been notified and that application has been made for applicable local approvals, at least 120 days prior to submittal. Note: Act 241, effective June 18, 1998 changes the definition of affected municipalities. The new law defines affected municipality as a town, city, village or county within 1,500 feet of the facility.	✓			Section 1.4, Appendix C	
✓ A copy of all requests for the specification of applicable local approvals.				Section 2.1, Appendix C	
__ Responses from all affected municipalities regarding any applicable local approvals.			✓		
✓ The standard municipal notice required by the waste facility siting board.	✓			Section 2.1, Appendix C	
__ Follow up applications for any applicable local approvals submitted to the clerk of the governing board of each participating municipality per s. 289.23(2), Stats.			✓		
(2) Documentation of and when copies of the ISR, the ISR opinion, any applicable pre-feasibility report, and the feasibility report have been submitted to each participating municipality under s. 289.33(6)(b), Stats.	✓			Appendix B, Appendix C	
NR 512.07 GENERAL FACILITY INFORMATION. Does the report include all of the following:					
✓ Project title	✓			Section 3.1	
✓ Name, address and phone number of primary contacts, including the landfill's owner, operator and any consultants	✓			Distribution List, Section 3.2	
✓ Present property owner	✓			Section 3.3	
✓ Proposed owner and operator	✓			Section 3.3	
✓ Proposed landfill location by ¼ -¼ section	✓			Section 3.4	
✓ Total acreage of property	✓			Section 3.5	
✓ Total acreage of proposed fill area	✓			Section 3.5	
✓ Proposed design capacity	✓			Section 3.6	
✓ Proposed site life in years	✓			Section 3.6	
✓ Anticipated date of closure	✓			Section 3	
✓ Municipalities and industries to be served	✓			Section 3.7	
✓ Anticipated waste types and characteristics	✓			Section 3.8	
✓ Anticipated volumes of each major waste stream and any seasonal fluctuations taking into account waste reduction, reuse, recycling, composting and the recovery of energy from solid waste	✓			Section 3.8	
✓ Anticipated cover frequency	✓			Section 3.9	

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
✓ Mode of operation	✓			Section 3.10	
✓ Anticipated sub-base, base and final grades	✓			Section 8.5, 8.6, 8.14	Plan Sheets 23, 24, 26
✓ Preliminary design concepts	✓			Section 8	
NR 512.08 LAND USE INFORMATION. Does the report include a thorough discussion of any changes in land uses or zoning within one mile of the proposed limits of filling since the submittal of the ISR?					
✓ Does the report include a discussion of any changes in the identification of adjacent landowners discussed? Note: this information may be presented on a plat map if it accurately shows current land ownership conditions.	✓			Section 4.4, Appendix F	
✓ Are any changes in zoning discussed?	✓			Section 4.3	
✓ Are any changes in present land uses discussed with emphasis on known recreational, historical, archaeological or state/local natural areas, county forest lands, and critical habitat?	✓			Section 4.5, Appendix B	
✓ Are any changes in existing and/or proposed transportation routes and access roads, including any new weight restrictions, discussed?	✓			Section 4.7	
✓ Does the report include any information or bird study requested by the Department or the FAA? Note: This applies only if the owner proposes to accept putrescible waste and the limits of filling are within 5 miles (for expansions) or 6 miles (for new landfills) of the end of an airport runway. [Ref. s. NR 504.04(3)(e) and 49 U.S.C. § 44718(d), See FAA Advisory Circular AC 150/5200-34A, dated 1/26/2006]	✓			Section 4.6, Appendix F	
NR 512.085 ALTERNATIVE GEOTECHNICAL INVESTIGATION PROGRAM.					
Has the applicant proposed an alternative geotechnical investigation program that includes the following: X Detailed description of the proposed alternative program X Detailed explanation of the rationale for the proposed differences to NR 512.09 or 512.10 X Anticipated benefits of the proposed alternative program X Is a copy of the accepted program included in the feasibility report? Note: The applicant may propose an alternative geotechnical investigation program prior to initiating the geotechnical investigations required for a feasibility report. The program may not be implemented prior to receipt of written review by the department. The formal approval of the accepted alternative geotechnical program is made in the department's feasibility determination.	X			Section 5.1, Section 5.2, Appendix I, Appendix J	Also see corresponding tables and figures referenced within the sections and appendix listed.

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
NR 512.09 SITE-SPECIFIC GEOTECHNICAL INFORMATION.					
Has an alternate geotechnical investigation program been approved by the department in writing? X yes __ no X If yes, does the report include justification for the approved alternative geotechnical investigation program?	X			Section 5.1, Appendix B, Appendix I	
(1) BORINGS. Have borings been made both inside and outside the proposed limits of filling?					
(a) Have the required number of borings been completed in or within 300 feet of the proposed limits of filling? X 10 borings for the first 5 or less acres of proposed fill area X 2 additional borings for each additional 5 or less acres of proposed fill area X Proposed limits of filling in acres X Number of borings required X Number of borings made within 300 feet of proposed limits of filling	X			Section 5.1, Section 5.2, Appendix J	During the Alternative Geotechnical Investigation of 2022, eight soil borings were completed within 300-feet of the proposed expansion (Table 5-1). There are also an additional 18 historical soil borings within 300-feet of the proposed expansion (Table 5-1).
(b) Do all borings extend at least 25 feet below anticipated sub-base grades? Note: For borings located outside the proposed limits of filling, applicable sub-base grade is the elevation of the bottom of the proposed base liner nearest to the borehole.			X	Section 5.2, Appendix J	The required amount of borings extend at least 25 feet below the anticipated sub-base grades.
(c) Has 1 boring been extended at least 5 feet into bedrock, if bedrock is within 50 feet of the lowest elevation of the proposed sub-base grades? Was bedrock drilling performed in accordance with ch. NR 141 and s. NR 507.05?	X			Section 5.1, Section 5.2, Appendix J	An exemption was granted for bedrock drilling, see Section 5.1.
(d) Were samples collected and retained and borings logs prepared in accordance with ss. NR 507.05 and 507.14? Note: The following requirements refer to NR 507.05 and 507.14.	X			Section 5.1, Section 5.2, Appendix J	
X **Fine-grained soils:** Was continuous sampling to 25 feet below sub-base grades performed?	X			Appendix J	
X **Coarse-grained soils or following continuous sampling in fine-grained soils:** Were samples collected from each major soil unit and at maximum 5 foot intervals?	X			Appendix J	
__ **Sample at the depth of well screen:** Was a soil sample collected at the depth of the well screen of any subsequently placed monitoring well and analyzed for grain size distribution using mechanical and hydrometer methods and Atterberg limits, as appropriate for the soil type?			X	Section 5.1, Appendix J	Due to all wells set within dolostone bedrock, soil samples were not able to be collected at the depth of each well screen. See exemption within Section 5.1.
__ **Bedrock samples:** Were continuous core samples collected?			X	Section 5.1, Appendix J	An exemption was granted for bedrock drilling, see Section 5.1.

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
X ***Soil samples:*** Do descriptions of each major soil sample unit include? X Structure X Lenses X Mottling X Geologic origin X Voids X USCS classified X Layering	X			Section 5.1, Appendix J	Full soil descriptions are provided within soil boring logs within Appendix J.
X Do descriptions of continuous bedrock core samples include? X General rock properties X Rock Quality Designation (RQD) X Fracture frequency X Percent recovery	X			Section 5.1, Appendix J	An exemption was granted for bedrock drilling, see Section 5.1.
X Does the report contain a boring log for each boring that includes the following? X Elevations of land surface and bottom of boring corrected to USGS (national geodetic survey) datum X If converted to a well, water level at the time of drilling, date of water level measurement, and a well construction diagram on the boring log	X			Appendix J, Appendix K	Mud rotary drilling was needed to drill and install wells; therefore, a water level was not able to be taken on the day of drilling. The date of the water level is noted within the boring log.
(e) Have all borings not converted to wells been abandoned in accordance with ss. NR 507.08 and 141.25 and been documented as instructed on Department forms (3300-5B)?	X			Appendix J	Abandonment forms are located within Attachment B of Appendix J.
(2) GROUNDWATER MONITORING WELLS.					
(a) Have the required number of ***water table observation wells*** with screens intersecting the water table been installed to adequately define the water table surface? X 5 water table observation wells for the first 5 or less acres of proposed fill area X 1 additional water table observation well for each additional 5 or less acres of proposed fill area 4 Proposed limits of filling in acres 5 Number of water table observation wells required 9 Number of water table observation wells installed	X			Section 5.2, Appendix J	Four perched water table wells and one piezometer was installed during 2022. An exmeption of code NR512.09(10 and 2) was granted to use one existing perched water table well, two existing regional water table wells, and five existing piezometers for the monitoring network.

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
(b) Have the required number of ***piezometers*** been installed? X 1 piezometer adjacent to a water table observation well at 2 separate locations for the first 5 or less acres of proposed fill area X 1 additional piezometer for each additional 10 or less acres of proposed fill area to create additional well nests X At least 1 well nest within the proposed limits of filling for every 20 acres of proposed fill area 4 Proposed limits of filling in acres 4 Number of piezometers required 4 Number of piezometers installed	X			Section 5.2, Appendix J	Four perched water table wells and one piezometer was installed during 2022. An exemption of code NR512.09(10 and 2) was granted to use one existing perched water table well, two existing regional water table wells, and five existing piezometers for the monitoring network.
(c) ***If the proposed site is in a fine-grained soil environment*** does each well nest required above in (b) consist of 3 wells (a water table observation well, a piezometer installed at or just below the proposed subbase grades and a deeper piezometer installed at least 15 feet below the bottom of the upper piezometer's well screen?			X	Section 5.1, Section 5.4.2, Appendix J	Well nests of 2 or 3 but all within bedrock. Wells within nests vary between perched water table wells, regional water table wells, and piezometers.
(d) Are all wells located ***no more than 300 feet*** from the proposed limits of filling and are at least half of the wells located no more than 150 feet from the proposed limits of filling?	X			Appendix J, Table 5-3, Plan Sheet 11	
(e) Are all wells designed, installed, developed, documented, and sampled in accordance with ch. NR 141 and ss. NR 507.06, 507.07, 507.14 and 507.17, or have alternative methods of well design and installation been approved by the department prior to well construction?	X			Appendix J	Well construction forms are within Attachment C of Appendix J and Well development forms are within Attachment D of Appendix J.
(3) FIELD DIRECTION. Did a Professional Geologist (P.G.) or qualified technician directly supervised by a P.G. perform the following tasks?					
X Observe and direct drilling of all borings X Observe and direct installation, development and abandonment of all wells X Conduct all in-field hydraulic conductivity tests X Visually describe and classify all geologic samples	X			Appendix J	Wisconsin Professional Geologist Melanie Niday provided all field direction. Melanie Niday's PG number is located on the certification page of the report.
(4) LABORATORY AND FIELD ANALYSIS.					
(a) Have 5 grain-size analyses per major soil unit (mechanical & hydrometer) with USCS classifications and Atterberg limits where appropriate been provided? 2 Number of major soil units 10 Number of grain size analyses required	X			Section 5.4.1, Table 5-2, Appendix J	The saprolite and dolostone units are not adequate for collecting hydrometer and atterberg limit samples.
(b) Have ***lab hydraulic conductivity tests*** been provided for 2 undisturbed samples from each major fine-grained soil unit?	X			Section 5.4.2, Table 5-2, Appendix J	

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(d) Have ***in-field hydraulic conductivity test*** data and results been provided for each well?	X			Section 5.4.2, Table 5-5, Appendix J	
(e) Does report include 6 monthly water level measurements for all wells?	X			Table 5-4	
(f) Does report include 6 monthly surface water level measurements for any surface water bodies including streams, lakes, ponds, drainage ditches and wetlands located within 1,000 feet of the proposed limits of filling?			X		
(g) ***Baseline groundwater quality*** for all wells located outside the proposed limits of filling in accordance with s. NR 507.18: NOTE: If a groundwater standard is attained or exceeded in any of the 4 baseline groundwater quality sample rounds, see ss. NR 140.28 and 507.29 for exemption criteria.	X			Section 5.4.3 Appendix J	
Note: The following requirements refer to s. NR 507.18. X 4 monthly rounds for each detection monitoring parameter listed in Appendix 1, Tables 1 and 2 of ch. NR 507, as appropriate, for the particular waste types to be accepted X 4 monthly rounds for Public Health and Welfare parameters listed in Appendix I, Table 3 of ch. NR 507 X 2 monthly rounds for VOCs, plus 2 additional sampling rounds for any wells that have VOC concentrations above their limit of detection	X			Section 5.4.3, Appendix J	Baseline analytical parameters are provided within Table 6 of Appendix J. A summary of baseline monitoring results is provided within Table 7 of Appendix J. Laboratory reports for baseline events are provided within Attachment I of Appendix J.
(h) Has the department required other work such as groundwater modeling, pump tests, geophysical investigations, isopach maps or a fence diagram to assess the hydrogeologic conditions at the proposed facility?	X			Section 5.1, Section 5.4.1.4, Appendix J, Plan Sheets 12-22	Geophysical investigation requested and completed. Gamma logs are provided within Attachment E of Appendix J and within cross-sections.
(5) SAMPLE RETENTION					
Have all soil and bedrock samples collected from the proposed property been retained in accordance with NR 507.05?	X			Section 5.1, Appendix J	
(6) ADDITIONAL REQUIREMENTS FOR LANDFILLS WITH EXTENDED COLLECTION LINES.					
(a) Does the landfill meet the requirements of (b) and (c) below for a facility where MSW is accepted and the leachate collection lines exceed 1,200 feet from the end of each cleanout to the toe of the opposite slope?			X		

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FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
(b) Does the report include the following: __ A minimum of one boring in the area of each proposed cell drilled to physically characterize subbase conditions for landfill foundation assessment of stability and settlement __ Borings that extend a minimum of 50 feet below the proposed subbase grades or to competent bedrock, whichever is shallower. __ Samples taken at each significant soil layer __ A minimum of one sample from each fine grained layer and from each soft or compressible coarse grained layer subjected to geotechnical testing to define parameters used in assessment of stability and settlement of the liner			X		
(c) Does the report include the consolidation testing data include the data summarized in the major soil unit table required by NR 512.10(2)(d)?			X		
NR 512.10 SUBSURFACE DATA ANALYSIS.					
(1) Does the subsurface investigations presented in the report include the minimum following requirements (unless an alternative geotechnical investigation plan was accepted in writing)?	X			Section 5, Appendix B, Appendix I, Appendix J	An AGIP was accepted in writing. See Appendix I for the AGIP and Appendix B for the WDNR AGIP approval letter.
(2) SOIL AND BEDROCK DESCRIPTIONS.					
(a) Have grain size distributions, geologic origin, USCS classification been provided for each major soil unit?	X			Section 5.4.1, Appendix J	
(b) Does the report describe the lateral and vertical extent of each major soil unit including descriptions of any lenses or other heterogeneities, and if bedrock was encountered by borings, the strike and dip of any rock formations?	X			Section 5.3.4, Section 5.4.1	Due to the poor quality of bedrock core collected during drilling, no strike and dip was able to be taken at site. See Section 5.3.4 for regional data.
(c) Does the report describe the presence and frequency of joints, fractures, voids, solution openings, faults or other structural features?	X				
(d) Does the report include a table summarizing the following testing data by major soil unit? X Geologic origin — X Liquid limit X Sample ID number — X Plasticity index X Percent gravel, sand, silt and clay — X Percent P200 content X Lab & field hydraulic conductivities X Statistical analyses for averaged values	X			Table 5-2, Table 5-5, Appendix J	Data for 2022 only is provided within Appendix J. Data for the landfill property is provided within Table 5-2 and Table 5-5.
(3) HYDROGEOLOGIC PROPERTIES AND FUNCTIONS**.** Does the report discuss the following properties and functions of each saturated soil unit or rock formation?					
(a) Hydraulic conductivity	X			Section 5.4.2	
(a) Role as a confining unit	X			Section 5.3.5	

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(c) Hydraulic connections to other units	X			Section 5.3.5	
(d) Actual/potential use as a water supply unit	X			Section 5.3.5	
(e) Depth to groundwater & seasonal variations in groundwater elevations	X			Section 5.4.2	
(f) Location & extent of perched groundwater	X			Section 5.4.2	
(f) Local & regional flow directions including the locations of groundwater divides	X			Section 5.3.5, Section 5.4.2	
(h) Horizontal & vertical gradients	X			Section 5.4.2	
(4) APPENDIX. Does the Appendix include the following?					
x All raw data x Soil boring log information forms 4400-122 x Well information forms (4400-89) x Groundwater and surface water level measurements x Monitoring well development forms (4400-113B) x Baseline groundwater quality sampling x Monitoring well construction forms (4400-113A) x Soil test results x Well/drillhole/borehole abandonment forms 3300-5B	X			Appendix J to P	All raw data from the 2022 investigation is provided within Appendix J attachments. All previously collected data, as applicable, is provided within Appendix K to Appendix P.
NR 512.11 DATA PRESENTATION. Are the results from the subsurface investigation presented on 24" x 36" plan sheets?	X			Plan Sheets 4-22	
(1) EXISTING CONDITIONS PLAN SHEET. Is a detailed topographical survey of all areas within 1500 feet of the proposed limits of filling provided (minimum scale 1" = 200' with maximum 2 foot contour interval) and does it show all of the following:	X				
(a) 100-year floodplain area	X			Appendix F	
(b) Surface waters, including intermittent & ephemeral streams & wetlands	X			Appendix F	
(c) Residences, buildings, utility lines & other cultural features	X			Appendix F	
(d) Surrounding land uses (residential, commercial, agricultural & recreational)	X			Appendix F	
(e) Property & proposed limits of filling, including any previous fill areas	X			Plan Sheet 3	
(f) Access control including fences & gates	X			Plan Sheet 3	
(g) Water supply wells including public, private, irrigation, & stock	X			Plan Sheet 3	
(h) Boring, test pit, and well locations for the proposed landfill	X			Plan Sheet 3	
(i) Other structures including storm water control systems, agricultural drain tile systems, access & internal roads, storm & sanitary sewerage systems	X			Plan Sheet 3	

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FEASIBILITY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(2) GEOLOGIC CROSS-SECTIONS.					
Have geologic cross-sections been constructed as follows: X Through all borings, both perpendicular and parallel to the proposed landfill's baseline X For proposed contiguous expansions, through all previous borings for the existing landfill X 1 cross-section parallel to groundwater flow	X			Section 5.1, Plan Sheets 12-22	
Do the geologic cross-sections include the following:					
(a) Inferred/questionable lithostratigraphic boundaries shown with a dashed line or question mark	X			Plan Sheets 12-22	
(b) Numbers/symbols used to label each major soil unit with a key that describes each major soil unit including geologic description and origin, USCS classification and color	X			Plan Sheets 12-22	
(C) Boring logs show USCS classification, geologic origin, grain size analyses, Atterberg limits, and field hydraulic conductivities	X			Plan Sheets 12-22	
(d) X Well construction details shown to scale including well screen and filter pack length, upper and any lower seals, and stabilized water levels measured on same day X If two or more observation wells are presented, a line representing the water table surface drawn and date the measurements were taken specified in the key	X			Plan Sheets 12-22	
(3) WATER TABLE MAPS.					
X Are at least two water table maps (seasonal high & low) provided?	X			Plan Sheets 4-7	
X For a proposed contiguous expansion, do the water table maps include the observation wells and measured water table elevations for each observation well for the existing landfill?	X			Plan Sheets 4-7	
X Has a bedrock piezometric map been provided if 3 or more bedrock wells have been installed?	X			Plan Sheets 8-9	
(4) BEDROCK MAP.					
Has a ***bedrock contour map*** been provided if 3 or more borings have been drilled into bedrock?	X			Plan Sheet 10	
(5) FLOW NET.					
Has a ***flow net***, parallel to the direction of groundwater flow to show distribution of recharge & discharge been provided?	X			Plan Sheet 21	

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FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
NR 512.12 WASTE AND LEACHATE CHARACTERIZATION.					
(1) INDUSTRIAL WASTES**.** Have the physical & chemical characteristics of any high volume industrial waste anticipated to individually constitute more than 5% of the total proposed design capacity and leachates been analyzed and described?	✓			Section 6.1, Table 6-1	
(2) MUNICIPAL WASTES**.** Does the report include actual field leachate data from existing landfills of similar size, design and waste type or an estimate of the anticipated leachate strength and quality?	✓			Section 6.2.1, Table 6-2, Appendix S	
(3) LEACHATE GENERATION**.** Does the report include the estimated daily volume of leachate that will be collected for unclosed and closed areas?					
(a) A minimum of 6 inches per year for all unclosed areas of the proposed limits of filling for landfills with a composite liner and a minimum of 4 inches per year for landfills that do not have a composite liner?	✓			Section 6.3, Table 6-3	
(b) One inch per year for all closed areas of the proposed limits of filling for landfills with a composite cap and a minimum of 3 inches per year for all closed areas that will not have a composite cap?	✓			Section 6.3, Table 6-3	
NR 512.13 CONSTRAINTS ON LANDFILL DEVELOPMENT.					
(1) LOCATIONAL CRITERIA AND PERFORMANCE STANDARDS. Does the report contain a demonstration that the proposed landfill will meet the locational and performance standards in s. NR 504.04?	✓			Section 7.1, Section 7.2, Appendix B	
(2) GEOTECHNICAL INFORMATION. Does the report contain an analysis of the following:					
X geologic X hydrogeologic X topographic X hydrologic features of the proposed property that may be favorable or unfavorable for landfill development	X			Section 5.3, Section 5.4, Section 7.3	
(3) CONSTRUCTION AND OPERATION. Does the report contain a discussion of the following materials and support services required for landfill construction and operation?					
✓ Leachate treatment alternatives ✓ Identification and detailed evaluation of the capability of any proposed wastewater treatment plant(s) to treat the leachate ✓ Quality & quantity of liner and cap materials ✓ Specialized engineering structures to support landfilling activities	✓			Section 7.3.5, Section 7.3.6, Section 7.3.7, Section 7.3.8	

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FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
(4) EXISTING FACILITY PERFORMANCE. For a proposed contiguous, horizontal or vertical expansion, does the report evaluate the compliance status and performance of the existing landfill?					
(a) Does the report reference the discussion on the compliance status and performance of the existing landfill contained in any applicable pre-feasibility report and include any changes since the submittal of that report?	X			Section 5.4.3	
(b) Does the report contain an exemption request under s. NR 140.28 and in accordance with s. NR 507.29 if a PAL or ES has been attained or exceeded at the site?	X			Section 1.3.1, Section 5.4.3	
NR 512.14 PROPOSED PRELIMINARY DESIGN.					
(1) PRELIMINARY DESIGN REPORT.					
(a) Does the report contain preliminary materials balance calculations for the necessary volume of clay to construct the liner and final cap of the first phase of the landfill?	✓			Section 8.15, Section 9, Appendix T	
(b) Does the report discuss proposed methods for leachate and gas control? ✓ Leachate collection ✓ Gas collection ✓ Leachate containment ✓ Gas containment ✓ Leachate treatment ✓ Gas treatment	✓			Section 8.8, Section 8.9, Section 8.10, Section 8.11, Section 8.13	
(c) Does the report discuss the proposed operating procedures, including the general filling sequence?	✓			Section 8.17.1, Section 8.17.2	
(d) Does the report include a description of the proposed monitoring programs to be implemented to meet the requirements of chs. NR 140 and 507? X Groundwater X Air X Leachate X Unsaturated zone X Surface Water X Other monitoring X Gas X Does the report contain a sampling plan for all monitoring devices in accordance with s. NR 507.16?	X			Section 5.4.3, Section 8.18, Appendix R	
(e) ✓ Does the report discuss the proposed methods for storm water control in accordance with ch. NR 216? ✓ Does the report discuss visual screening?	✓			Section 8.4, Section 8.16	

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
(f) Does the report discuss the proposed final use?	✓			Section 8.19	
(2) PRELIMINARY ENGINEERING PLANS. (24" x 36" Plan Sheets w/max. 5-foot contours):					
(a) Does the report include an existing conditions map that shows the following? ✓ Proposed access ✓ Associated buildings ✓ Limits of filling ✓ Storm water diversions ✓ Internal roads ✓ Sedimentation basins ✓ Load out & scale facilities ✓ Phase of facility development ✓ Sub-base & base grades ✓ Slopes ✓ Leachate collection system ✓ Leachate storage tank ✓ Lift station/sewer hook up	✓			Drawings	
(b) Does the report include geologic cross-sections plan sheet(s) that display the following information? ✓ Present topography ✓ Proposed final grades ✓ Proposed sub-base grades ✓ Liner and final cap configuration ✓ Proposed base grades	✓			Drawings 12-22	
(c) Does the report include a plan sheet showing the proposed closure sequence and final grades?	✓			Drawings 26	
NR 512.15 IDENTIFICATION OF SOIL BORROW SOURCES. Note: It may be necessary to obtain federal, state and/or local permits prior to excavating soil from a borrow source near surface waters or wetlands. For example, s. 30.19(1)(c), Stats., requires a permit for grading or removing top soil from the bank of any navigable stream, lake or body of navigable water where the area exposed by such grading or removal will exceed 10,000 square feet. It is the responsibility of the applicant or property owner to request an initial site inspection in accordance with ch. NR 509 and to obtain any federal, state and/or local permits that are required.					
(1) Does the report include a copy of the department's initial site inspection evaluation letter for the proposed borrow source(s) needed to construct, operate and close the first phase of the landfill?			✓	Appendix T	Pre-approved borrow source located on existing owned property

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(2) Does the report include documentation for soil borrow sources as described in NR 504.075 for the proposed soil borrow sources designated to be used in the construction, operation or closure of the first phase of the landfill? See below.			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
NR 504.075 SOIL BORROW SOURCES.					
(1) GENERAL.					
Is the soil borrow source being developed for the purpose of construction, operating or closing a landfill? If yes, this section applies. Note: Written approval from the department shall be obtained prior to initiating soil borrow activities at any borrow source subject to these requirements.			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(2) EXEMPTIONS. The following activities are exempt from the requirements of this section:					
(a) __ The production of processed aggregate products. __ Excavation of soils from construction projects off of the landfill property and not being used for compacted clay liner or capping layer, soil barrier layer, leachate collection layer or final cover drain layer?			✓		Pre-approved borrow source located on existing owned property
(b) Is the soil borrow source within the proposed or approved limits of filling for a landfill? If yes, then the landfill is not subject to the requirements of subs. (3) and (4)(b).			✓		Pre-approved borrow source located on existing owned property
(3) INITIAL SITE INSPECTION.					
Does the report include a copy of the department's initial site inspection for each proposed borrow source?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property

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FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
(4) LOCATIONAL INFORMATION.					
(a) Does the submittal describe the following: __Total acreage __ Ownership __ Location (¼-¼ section) __ Present land use __ Transportation routes __ Any access restrictions __ Travel distance to and from landfill			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(b) Does the submittal include the following: __ Surface water drainage patterns __ Significant hydrologic features (surface waters, springs, drainage divides and wetlands) __ Areas of special natural resource interest (critical habitat or state/local natural areas) __ Historical/archaeological areas within and adjacent to proposed limits of excavation			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(5) FIELD AND LABORATORY INVESTIGATIONS FOR CLAY BORROW SOURCES AND SOIL BARRIER LAYER SOURCES.					
Does the submittal for soil borrow sources include field and laboratory investigations to define the physical characteristics of any clay borrow source or soil barrier layer source designated to be used for a liner or final cover?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
Has an alternate geotechnical investigation program been approved by the department in writing prior to the field and laboratory investigation? __ yes __ no If yes, does the report include a copy of and justification for any approved alternative geotechnical investigation program? Note: An alternative geotechnical investigation program may be submitted in cases where previous information exists regarding the proposed soil borrow source.			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(a) Have the required number of test pits or borings been completed on a uniform grid pattern across the proposed borrow source(s)? __ 10 test pits/borings for the first 5 or less acres __ 1 additional test pit/boring for each additional 3 or less acres __ Proposed acreage of proposed borrow source(s) __ Number of test pits/borings required __ Number of test pits/borings made __ Have logs identifying geologic origin, testing results, USCS classification, and visual description of each major soil unit encountered also been included?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(b) Does the report include Atterberg limits and grain size analyses to 0.002 mm particle size for 2 samples from each test pit/boring?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property

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FEASIBILITY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(c) Does the report include the relationship of water content to dry density using either the modified or standard Proctor method (curves must be developed with a minimum of 5 points) for 1 sample from each major soil unit and no fewer than 3 samples for uniform clay deposits?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(d) Does the report include laboratory hydraulic conductivity test results for each sample used to develop the Proctor curves?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(6) STOCKPILING.					
Does the report include discussion of segregating stockpiled soils by USCS soil type, soil gradation, Atterberg limits and compaction specifications? Note: Stockpiling of soils obtained from clay borrow sources and soil barrier layer sources for landfill liner of final cover construction shall be conducted in an organized manner that minimizes mixing of dissimilar soil types. Soils from differing sources may not be commingled unless soil properties are similar.			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(7) DATA PRESENTATION FOR ALL CLAY BORROW SOURCES AND SOIL BARRIER LAYER SOURCES. Does the submittal for soil borrow sources for clay and soil barrier layers include the following?					
(a) Calculated volume of soil needed and the volume of acceptable soil available			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(b) Property boundaries and test pit/boring locations on a topographic map (scale: 1" = 500') that extends a minimum of 500 feet beyond the proposed borrow source			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(c) Isopach map showing thickness of acceptable soil			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(d) Description of methods for separating acceptable soil from unacceptable soil			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(e) Proposal for maintaining drainage and sedimentation control			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(f) All data from the testing program			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(8) DATA PRESENTATION FOR OTHER BORROW SOURCES. Does the submittal for soil borrow sources other than those used for clay and soil barrier layers include the following?					
(a) Property boundaries shown on a topographic map (scale: 1" = 500') that extends a minimum of 500 feet beyond the proposed borrow source			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(b) Proposal for drainage and sedimentation control			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(9) STORMWATER MANAGEMENT.					
Does the submittal for a soil borrow source include a stormwater management plan that complies with the requirements of s. NR 504.09(1)(a) to (f) and (h) to (j), unless the borrow source is subject to other permits with equivalent authority and requirements, such as a stormwater discharge permit or non-metallic mining reclamation permit?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(10) RECLAMATION OR BORROW SITES.					
(a) Does the report include reclamation plans for borrow sources on the landfill property that include the following: __ post-mining land use that is integrated with the existing and proposed drainage __ surface water discharge requirements __ grades and final use of the landfill Is the reclamation plan consistent with NR 135.06 to 135.12?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(b) For soil borrow areas not on landfill property, is the reclamation plan consistent with NR 135? If required, has a reclamation plan been submitted and a nonmetallic mining reclamation permit been received from the appropriate regulatory authority?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(11) OTHER REQUIRMENTS.					
(a) If the proposed clay borrow source(s) contains less than a five foot, but greater than 2 foot uniform clay thickness, does the report contain a construction methodology and documentation procedure to ensure the liner meets the soil index property requirements of s. NR 504.06(2)(a)?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(b) Does the report include a description of measures to be taken to comply with wetlands protection requirements, runoff and sediment controls and surface water discharge permit requirements and to minimize effects on areas of special natural resource interest and historical or archaeological areas within and adjacent to the proposed limits of excavation?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
NR 512.16 ENVIRONMENTAL REVIEW. To aid the department in complying with ch. NR 150, Wis. Adm. Code, the report must include an environmental analysis (EA) section. Does the EA section include the following: Note: Information provided in previous sections of the ISR, any applicable pre-feasibility report, or the feasibility report may be referenced to satisfy this section's requirements.					
(1) PROJECT SUMMARY. Does the EA section contain a Project Summary that includes the following:					
x Brief overview of the project x Listing of statutory authority x Relevant local, state and federal permits or approvals required x Need for exemptions, zoning changes & other special permits or approvals	X			Section 10.1 Table 10-1	

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FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
(2) PROPOSED PHYSICAL CHANGES. Does the EA section contain a brief description of the proposed physical changes that includes all of the following:					
(a) Changes in terrestrial resources to include a discussion of the following: x Quantity of soil to be excavated and the lateral extent of soil removal x Quantity and source of soils designated to be used in the construction, operation or closure of the landfill x Description of all earthen modifications (such as clearing & grubbing, excavation, soil placement needed to reach the proposed sub-base grades, construction of access roads, stockpiles and storm water controls).	X			Section 10.2	
(b) Changes in aquatic resources including: x Potential impacts to streams, wetlands, ponds, lakes & flowages x Discharge rates and volumes under existing conditions as well as that anticipated during active operations and following closure for: NA Groundwater control structures x Leachate collection systems x Storm water control structures x Information or reports on how the proposed landfill and soil borrow sources for the first phase of the proposed landfill comply with s. 30.19 Stats., and ch. NR 103.	X			Section 10.2.2 Section 8.8 Table 6-3 Section 8.16 Appendix G	
(c) Discussion of buildings, treatment units, roads and other structures (such as sedimentation basins and fences) to be constructed including: NA size of the facilities (i.e., structures) NA miles of road to be constructed:	X			Section 10.2.3	
(d) Emissions and discharges (such as dust, engine exhaust, odors, noise, gases, leachate, storm water and collected groundwater) associated with the following: x Landfill preparation x Closure x Construction x Post-closure x Operation	x			Section 10.2.4	
(e) Other changes anticipated with landfill development			X		
(f) Maps, plans and other descriptive material to clarify the discussion such as but not limited to the following: X County map X Proposed service area map X USGS map Plat map Zoning map X County wetlands map X Soils map X Landfill development plan	X			Appendix F	

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FEASIBILITY REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
(3) EXISTING ENVIRONMENT. Does the EA section contain a brief description of the existing environment that may be affected that includes the following:					
(a) A description of the existing physical environment including: x Regional & local topography x Geology x Surface waters & drainage features x Hydrogeologic conditions x Air quality x Wetlands x Designated soil borrow sources	X			Section 10.3	
(b) A description of the following: x dominant aquatic and terrestrial plant and animal species and habitats found in the area including: x Any threatened/endangered species NA Amount, type & hydraulic value of wetlands	X			Section 10.3.2 Appendix B	
(c) Land use including dominant features and zoning in the area	X			Section 10.3.3	
(d) Social and economic conditions including any ethnic or cultural groups	X			Section 10.3.4	
(e) Other special resources such as: x Archaeological x Historical x State/local natural areas x Prime agricultural lands	X			Section 10.3.5	
(4) ENVIRONMENTAL CONSEQUENCES. Does the EA section contain a brief discussion of the probable adverse and beneficial impacts including primary, indirect and secondary impacts that includes the following:					
(a) Physical impacts associated with landfill design, construction and operation, including: x Air quality x Windblown paper x Dust x Visual impacts	X			Section 10.4 Table 10-2 Table 10-3	
(b) Biological impacts including: x Destruction and creation of habitat x Alteration of the physical environment NA Impacts to endangered/threatened species	X			Section 10.4 Table 10-3 Appendix B	
(c) Impacts on land use	X			Section 10.4.3	
(d) Social and economic impacts (such as effects on taxes, noise, traffic and roads, and consistency with local planning and zoning) to the following groups served by the landfill: x Local residents x Communities x Cultural groups x Industries	X			Section 10.4.4	

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(e) Other special resources such as but not limited to: __x__ Archaeological __x__ Historical __x__ State/local natural areas __x__ Prime agricultural lands	X			Section 10.4.5	
(f) Probable adverse impacts that cannot be avoided including: __NA__ Groundwater and surface water impacts __x__ Modifications of topography __NA__ Soil borrow source limitations on development around the landfill __x__ Loss of agricultural or forest land __x__ Displacement of wildlife [in and around the landfill] __x__ Adverse aesthetic impacts for people	X			Section 10.4.6 Table 10-1 Table 10-2	
(5) ALTERNATIVES. Does the report identify, describe and discuss feasible alternatives?					
Alternatives: __x__ Taking no action __x__ Enlarging, reducing or modifying the project to mitigate impacts __x__ Other landfills, locations or methods to the proposed action and their impacts	X			Section 10.5	
Has particular attention been given to alternatives which might avoid some or all adverse environmental impacts, including planned and existing waste reduction & recycling, incineration, solid waste disposal, and transfer facilities that may serve to handle the waste expected to be disposed of at the proposed landfill, taking into account the economics of waste collection, transportation and disposal?	X			Section 10.5.4 Section 10.5.5	
NR 512.17 NEED AND DESIGN CAPACITY. Note: In determining the design capacity of the proposed landfill under s. 289.29(1)(d), Stats., the department considers the effect of planned and existing waste reduction and recycling activities and other existing or proposed competing solid waste facilities, regardless of whether or not the other facilities are located within the service area, as defined under s. 289.28(1), Stats., of the proposed landfill.					
Is the proposed landfill part of a prospection or mining operation or a landfill for the disposal of waste generated by a pulp or paper mill and exempt under s. 289.28(2)? __ yes __x__ no			X		

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
In addition to the information specified in s. 289.28(1), Stats. (below) does the report include the following: _x_ Identification of the following activities/facilities used to manage solid wastes generated within the anticipated service area of the proposed landfill: _x_ Identification of existing waste reduction/recycling activities _x_ Identification of existing solid waste facilities _x_ Remaining design capacity of each facility identified _x_ Information for the activities/facilities, identified above, for which a significant commitment or implementation or development has been made	X			Section 11.3.4	
289.28(1), Stats. DETERMINATION OF NEED.					
(a) An approximate service area for the proposed facility which takes into account the economics of waste collection transportation and disposal.	X			Section 11.2	
(b) The quantity of waste suitable for disposal at the proposed facility generated within the anticipated service area.	X			Section 11.3	
(c) The design capacity of the following facilities located within the anticipated service area:	X			Section 11.4	
1. Approved facilities, including the potential for expansion of those facilities on contiguous property owned or controlled by the applicant.	X			Section 11.4.1	
2. Nonapproved facilities which are environmentally sound.	X			Section 11.4.2	
3. Other proposed facilities for which feasibility reports are submitted and determined to be complete by the department.	X			Section 11.4.3	
4. Facilities for the recycling of solid waste or for the recovery of resources from solid waste which are licensed by the department	X			Section 11.4.4	
5. Proposed facilities for the recycling of solid waste or for the recovery of resources from solid waste which have plans of operation which are approved by the department.	X			Section 11.4.5	
6. Solid waste incinerators licensed by the department.	X			Section 11.4.6	
7. Proposed solid waste incinerators which have plans of operation which are approved by the department.	X			Section 11.4.7	
(d) If the applicant is a municipality and the need for a proposed facility cannot be established under the criteria listed under (a) through (c) above, does the report demonstrate need based on the extent to which the proposed facility is needed to replace other facilities of that municipality at the time those facilities are projected to be closed in the plans of operation?			X		

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
289.29(1)(d), Stats. CRITERIA FOR DETERMINATION OF FEASIBILITY.					
Does the report indicate that the anticipated site life is between 10 to 15 years for a new facility or less than 15 years for an expansion? X yes __ no	X			Section 11.7	
NR 512.18 EVALUATION OF ALTERNATIVES TO LAND DISPOSAL. Does the feasibility report contain an analysis of the alternatives to land disposal of waste, including potential and existing waste reduction, reuse, recycling, composting and energy recovery initiatives and services?					
(1) ANALYSIS OF ALTERNATIVES TO LAND DISPOSAL. Does the analysis include a discussion of the trends affecting the waste stream, an estimate of the cost per ton for each alternative, when available and an evaluation of the feasibility of implementing each potential alternative?	X			Section 12	
(2) EVALUATION OF IMPLEMENTING ALTERNATIVES TO LAND DISPOSAL. Does the feasibility report evaluate the feasibility of implementing waste reduction initiatives and recycling services in connection with the proposed landfill and describe any waste reduction incentives and recycling services to be provided at the proposed landfill?	X			Section 12.2	
NR 512.19 NONCOMPLIANCE WITH PLANS OR ORDERS					
Does the report include the following: __ Identify all persons owning a 10% or greater interest in the applicant or assets of applicant __ Identify other Wisconsin solid and hazardous waste facilities owned by applicants __ Indicate whether all plan approvals and orders for facilities owned by applicants are being complied with	X			Section 2.5	
289.24(1)(c), Stats. COUNTY SOLID WASTE MANAGEMENT PLANS					
Does the feasibility report contain a description of how the proposed facility relates to any applicable county solid waste management plan approved under s. 289.10, Stats? Note: Applicants must address all DNR approved County plans within their proposed service area.	X			Section 2.3	

Facility Name: Vernon County Landfill

FEASIBILITY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
289.24(1)(d) ADVISORY AND PUBLIC OPINION PROCESS					
Does the feasibility report contain a description of the advisory process undertaken by the applicant prior to submittal of the feasibility report to provide information to the public and affected municipalities and to solicit public opinion on the proposed facility?	X			Section 2.4	

Legal Note: This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

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A-2 – Design and Construction Criteria Completeness Checklist, NR 504

Design and Construction Criteria Completeness Checklist
Chapter NR 504, Wis. Adm. Code

Revised January 2022

Waste & Materials Management
P.O. Box 7921
Madison, WI 53707-7921

Instructions: This checklist is intended for use by department staff for the review of landfill plan of operation and feasibility reports to determine completeness. The checklist may also be used by applicants and submitted with a landfill plan of operation or feasibility report to facilitate department review. Refer to applicable statues and codes for exact requirements.

General Information

Facility Name: Vernon County Landfill License/Monitoring # 3268

Facility Type: Expansion of an existing MSW Landfill

Initial Submittal: Date Received: ____/____/____ Completeness Due: ____/____/____ DNR Response: ____/____/____ (Complete: __ yes __ no)

Addendum # __ Date Received: ____/____/____ Completeness Due: ____/____/____ DNR Response: ____/____/____ (Complete: __ yes __ no)

Addendum # __ Date Received: ____/____/____ Completeness Due: ____/____/____ DNR Response: ____/____/____ (Complete: __ yes __ no)

Proposed Waste Types: MSW, C&D, special waste

Proposed Total Design Capacity: 427,355 CY (including daily and intermediate covers)

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
NR 504.04(3) LOCATIONAL CRITERIA. Are the proposed limits of filling within:					
(a) 1,000 feet of any navigable lake, pond or flowage not including landfill drainage or sedimentation control structures? __ yes ✓ no __ If yes, was an exemption requested?	✓			Section 7.1.1, Appendix B	
(b) 300 feet of any navigable river or stream? __ yes ✓ no __ If yes, was an exemption requested?	✓			Section 7.1.2, Appendix B	

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(c) A 100-year flood plain? __ yes ✓ no __ If yes, was an exemption requested?	✓			Section 7.1.3, Appendix B	
(d) 1,000 feet of the nearest edge of the right-of-way of any state trunk highway, interstate or federal aid primary highway or any public park or state natural area? __ yes ✓ no __ If yes, was a line of site study provided showing that the landfill would not be visible from the road, park or natural area through the use of screening and/or, __ was an exemption requested? Note: If waste may be visible for periods of time even with the use of screening, then an exemption should be requested.	✓			Section 7.1.4, Appendix B	
(e) 10,000 feet of the end of an airport runway designed or planned to be designed and used by turbojet aircraft or within 5,000 feet of any airport runway designed for and used by piston type aircraft? __ yes ✓ no Is FAA notification required? ✓ yes __ no Note: If the proposed limits of waste filling would be within 5 miles (for expansions of an existing MSW landfill) or within 6 miles (for new MSW landfills, after year 2000) of the end of the runway of any airport used by turbojet or piston type aircraft, the applicant must provide notice to both the Federal Aviation Administration (FAA) and the affected airport. The report should contain all correspondence related to the notices including any determinations made by the FAA. (Ref. 49 U.S.C. § 44718(d), See FAA Advisory Circular AC 150/5200-34A, dated 1/26/2006)	✓			Section 7.1.4, Section 7.1.5, Appendix B, Appendix H	
(f) 1,200 feet of any water supply well (i.e. public, private, irrigation or stock water supply wells)? __ yes ✓ no __ was an exemption requested? If yes, have the following been provided for each identified well? __ well location __ former and present well owner __ well driller __ well construction log Note: Exemptions may not be granted if the above information is not provided.	✓			Section 7.1.6, Appendix B	
(g) 200 feet of a fault that has had displacement in Holocene time? __ yes ✓ no __ If yes, was an exemption requested?	✓			Section 7.1.7	
(h) Seismic impact zones? __ yes ✓ no __ If yes, was an exemption requested?	✓			Section 7.1.8	
(i) Unstable areas? __ yes ✓ no __ If yes, was an exemption requested?	✓			Section 7.1.9	

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
NR 504.04(4) PERFORMANCE STANDARDS. Will the proposed landfill cause the following:					
(a) A significant adverse impact on wetlands? __ yes ✓ no Has a practicable alternatives analysis and a wetland functional values analysis been completed in accordance with ch. NR 103, if a wetland will be affected by the proposed landfill or any noncommercial soil borrow source activity? Note: See DNR wetland regulation website (https://dnr.wisconsin.gov/topic/Wetlands/permits) to help determine if a wetland permit may be needed per s. 281.36, Stats.	✓			Section 7.2.1, Appendix B, Appendix G	
(b) A take of an endangered or threatened species in accordance with s. 29.604, Stats? __ yes ✓ no	✓			Section 7.2.2, Appendix B	
(c) A detrimental effect on any surface water? __ yes ✓ no Note: Exemptions are not granted.	✓			Section 7.2.3, Appendix B	
(d) A detrimental effect on groundwater quality or will cause or exacerbate an attainment or exceedance of any preventive action limit or enforcement standard at a point of standards application as defined in ch. NR 140? __ yes ✓ no __ Has an exemption been requested to the groundwater standards in accordance with ss. NR 507.29 and NR 140.28, Wis. Adm. Code? If an exemption is required, does the feasibility report include: __ A list of the specific wells and parameters for which an exemption is being requested. __ A discussion of how the criteria listed in s. NR 140.28(2), (3) and (4) are met.	✓			Section 7.2.4, Section 5.4.3, Appendix B	
(e) The migration and concentration of explosive gases in excess of 25% of the lower explosive limit for such gases at any time? __ yes ✓ __ no	✓			Section 7.2.5, Section 8.13	
(f) The emission of any hazardous air contaminant exceeding the limitations for those substances contained in s. NR 445.04 or 445.05? __ yes ✓ __ no	✓			Section 7.2.6	
NR 504.05 GENERAL DESIGN AND CONSTRUCTION CRITERIA.					
(1) Is the landfill designed in substantial conformance with the design criteria in ss. NR 504.06 to 504.09?	✓			Section 7.3.6	
(2) Is supporting justification included for any differences from ss. NR 504.06 to 504.09?			✓		
(3) Is the proposed operating life of the landfill between 10 and 15 years?	✓			Section 3.6, 8.2, 11.6	
If the proposed life is not between 10-15 years is the facility exempted in s. 289.28(2), Stats. or the expansion of an existing facility?			✓		

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
NR 504.06 MINIMUM DESIGN AND CONSTRUCTION CRITERIA FOR LANDFILL LINERS AND LEACHATE COLLECTION SYSTEMS.					
(1) GENERAL.					
(a) If the landfill is proposed to accept municipal solid waste does the design incorporate a composite liner and a leachate collection system capable of limiting the average leachate head on the composite liner to 1 foot or less during operation and after closure of the landfill?	✓			Section 8.7, Section 8.8	
Does the composite liner consist of the following: ✓ An upper geomembrane component with nominal 60-mil minimum thickness ✓ A lower component of 4 foot minimum compacted clay meeting NR 504.06(2)(a)	✓			Section 8.7	
(2) COMPOSITE OR CLAY LINED LANDFILLS. Does the composite liner or clay liner design meet the following requirements:					
(a) Will all clay used in liner construction meet the following specifications: ✓ A minimum of 50% by weight passing 200 sieve ✓ A saturated hydraulic conductivity of $1x10^{-7}$ cm/sec or less ✓ An average liquid limit of 25 or greater with no values less than 20 ✓ An average plasticity index of 12 or greater with no values less than 10	✓			Section 8.7.1	
(b) Is there at least a 10 foot separation between the seasonal high groundwater table and the bottom of the clay liner component? Note: For zone of saturation landfills select NA.	✓			Section 8.5	
(c) Is there at least a 10 foot separation between the bedrock surface and the bottom of the clay liner component?	✓			Section 8.5.1	
(d) Is there a minimum 2% liner surface slope toward the leachate collection system?	✓			Section 8.6	
(e) Is there a minimum 4 foot thick clay component of a composite liner or a minimum 5 foot clay liner thickness?	✓			Section 8.7.1	
(f) 1. Are the clay layers proposed to be constructed in the following manner: ✓ Lift heights no greater than 6 inches after compaction ✓ Footed compaction equipment having feet at least as long as the loose lift height ✓ Disking or mechanical processing of clay to break up clods and adjust moisture ✓ Clod size no greater than 4 inches ✓ All compaction equipment to have a minimum static weight of 30,000 pounds __ Alternative procedures or equipment proposed	✓			Section 8.7.1	Constructed in accordance with NR 504.06(2)(f)
2. A sufficient number of equipment passes to ensure complete remolding of clay?	✓			Section 8.7.1	
3. Is clay compaction proposed to be 90% modified Proctor density at 2% wet of the optimum or 95% standard Proctor density at wet of the optimum moisture content? Alternately, the line of optimums method may be used.	✓			Section 8.7.1	

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(g) Are interior sidewall slopes at a maximum of 3H:1V or at a minimum of 5H:1V?	✓			Section 8.6	
(h) Are clay components of the liner in adjacent phases keyed together?		✓		Section 1.3.1	
Is the keying accomplished by excavating a minimum of 4 steps with a total width of spliced area measuring at least 15 feet?		✓		Section 1.3.1	
(3) COMPOSITE-LINED LANDFILLS. If the landfill is composite lined, are the following requirements specified in the plan of operation:					
(a) Is the geomembrane specifically formulated for waste containment purposes?	✓			Section 8.7.2	
Is the nominal geomembrane thickness 60 mil or greater with no thickness below minimum industry accepted manufacturing tolerances?	✓			Section 8.7.2	
(b) Is there geomembrane protection along areas of traffic or concentrated activity such as sumps, sideslope risers and entry ramps?	✓			Section 8.7.2	
(c) For slopes in excess of 10%, will geomembrane panels be installed with panel seams perpendicular to the contour lines of the slope?	✓			Section 8.7.2	
(d) Prior to geomembrane placement, will the clay surface be prepared as follows: ✓ Rolling and grading of clay surface to remove irregularities, protrusions, loose soil and abrupt changes in grade, ✓ Free of stone, grading stakes, construction debris and contain no areas softened by high water content ✓ Sufficiently dry and dense clay surface such that the construction equipment will not create ruts ✓ Depressions and large cracks filled with tamped clay	✓			Section 8.7.2, Section 8.14.3	
(e) Will the geomembranes be welded as follows: ✓ Geomembrane panels welded by double-tracked, fusion welding machines for all linear seams, ✓ Fusion welding of corners, butt seams and long repairs where possible, ✓ Extrusion or fusion welding for all other repairs, detail work and patches, ✓ Request for Department approval for other welding methods.	✓			Section 8.7.2, Section 8.14.3	
(f) Will geomembrane components in adjacent phases be welded together to form a continuous geomembrane surface?	✓			Section 8.7.2	
Will the liner extended beyond the proposed edge of waste at a phase junction be protected from traffic and weather?	✓			Section 8.7.2	
(g) Will wrinkles which are taller than they are wide be smoothed or cut out prior to covering with soil?	✓			Section 8.7.2	
Will guidance be provided to machine operators placing soil on geomembrane by the use of an observer with an unobstructed view of the advancing lift of soil.	✓			Section 8.7.2	

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(h) Are the following minimum soil thickness on geomembrane proposed before vehicular traffic may occur: ✓ 1 foot for vehicles with ground pressure less than 5 pounds per square inch, ✓ 2 feet for other vehicles equipped with tracks and floatation tires, ✓ 3 feet or more for trucks or wheeled hauling equipment.	✓			Section 8.8.2.2	
(i) In order to lessen desiccation effects, will the landfill base and the lower 10 feet of the sideslope be covered with a drainage blanket within 30 days after completing quality control and quality assurance testing?	✓			Section 8.8.2	
Will the remaining sideslope be covered with either drainage material or geotextile to prevent damage to the geomembrane?	✓			Section 8.8.2.2	
(j) Will placement of soil over the geomembrane be performed during cooler temperature periods to the extent possible using methods which minimize wrinkling?	✓			Section 8.8.2.2	
(k) Will anchor trenches be designed and constructed around the landfill to secure the permanent edges of the geomembrane?	✓			Section 8.7.2	
Will geomembrane be seamed completely to the edge of the panel end to minimize potential of tear propagation?	✓			Section 8.7.2	
(4) ZONE-OF-SATURATION LANDFILLS. Landfills with proposed base grades below the groundwater table must meet the following:					
(a) Is the landfill located in a fine-grained soil environment?			✓		
(b) Does the landfill meet the requirements of sub. (2)(a), (d), (e), (f), (g) and (h) and the requirements under sub. (3), if the landfill will accept municipal solid waste?			✓		
(c) Has an analysis been performed on the effect which groundwater may have on uplift of the liner and the short and long-term stability of the geomembrane component?			✓		
Does the analysis evaluate the effect of an underdrain or other dewatering system?			✓		
(d) Have borings, backhoe pits or other means of exposing the subsurface soils been proposed on a 100-foot grid to a minimum 5 foot depth below the subbase grades of the liner?			✓		
Are all granular or silty soils detected within this 5 foot depth proposed to be removed?			✓		

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(5) LEACHATE COLLECTION SYSTEMS. The leachate collection system must incorporate the following design features:					Design will be completed during the Plan of Operation
(a) Does the leachate collection system design include the following features: ✓ A leachate collection system included in each horizontal phase, ✓ Leachate routed to the landfill perimeter in the most direct manner possible, ✓ Limit average leachate head on the liner to 1 foot or less, ✓ Limit maximum leachate flow distance to the perforated collection pipe to 130 feet.	✓			Section 8.8.2	
(b) Is the slope on the leachate collection pipe a minimum of 0.5%?	✓			Section 8.8	
(c) Is the minimum diameter of all leachate collection pipes 6 inches?	✓			Section 8.8	
Are all collection pipes proposed to be Schedule 80 PVC pipe or an approved substitute?	✓			Section 8.8	
(cm) Are the proposed pipe fittings for use with PVC and HDPE pipe secured to the leachate collection pipe as follows: ✓ PVC fittings and pipe solvent-welded ✓ HDPE fittings and pipe fusion welded	✓			Section 8.8	
(d) Do the leachate collection trenches conform to the following: __ Rectangular leachate collection trenches for clay liners ✓ V-trenches with a maximum 18 inches depth and 3H: 1V sideslope for composite liners ✓ V-trenches smooth-drum rolled prior to placement of the membrane	✓			Section 8.8.2.3	
(dm) ✓ Is a geotextile with a weight of 12 oz/yd^2 used to line the trench base and sidewalls and is it placed directly over the geomembrane ✓ Does the design show that the geotextile does not overlap across the top of the trench. ✓ Are the geotextile specifications, including manufacturer's data for grab and puncture strength, used to demonstrate the resistance to damage from the aggregate to be placed over the geotextile?	✓			Section 8.8.2.3, Section 8.9.1	

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(e) Does the leachate collection pipe trench backfill conform to the following: ✓ Uniformity coefficient of less than 4, ✓ Maximum particle diameter of 1 ½ inches, ✓ Maximum of 5% passing the number 4 sieve, ✓ Rounded to subangular gravel, ✓ Minimum 4 inches bedding depth before installation of leachate pipe, ✓ Minimum 6 inches of granular material above the pipe, and an additional 12 inches of material mounded above the trench, ✓ Graded soil filter or geotextile to minimize migration of drainage blanket into the trench, in cases where particle size of the bedding is significantly less than the collection trench bedding ✓ No use of limestone and dolomite as trench backfill. ✓ If limestone and dolomite are proposed for use as trench backfill, does the plan of operation address that there is no other suitable material reasonably available?	✓			Section 8.8.2.2	
(f) Have the sand and gravel sizes and geotextile and pipe openings been analyzed for the control of piping of soil materials and have the materials been chosen to achieve a stable and self-filtering structure under all conditions of leachate flow?	✓			Section 8.8.2.2	
(g) Do leachate collection lines have cleanout access on both ends of pipes?	✓			Section 8.8	
Does each leachate collection line have a maximum distance of 1,200 feet from the end of one cleanout to the toe of the opposite slope?	✓			Section 8.8	
(h) Are there no vertical liner penetrations due to leachate lines, manholes and other engineering structures?	✓			Section 8.8	
For clay lined landfills, are liner penetrations limited to leachate transfer lines in the horizontal direction only? For composite lined landfills, are there no liner perforations?	✓			Section 8.8	
(i) Is a 4'x4', 5 foot thick, anti-seep collar placed around any leachate transfer line penetrating the clay liner?			✓		

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(j) Is the composite lined landfill designed with a sump and sideslope riser meeting the following requirements: ✓ 1. Sump volume and pump capacity sized to accommodate an annual leachate collection rate of 6 inches taking into account the potential for solids to build up over time. ✓ 2. Sump base protected with polyethylene plate or other acceptable means and placed prior to sideslope riser and backfill installation. ✓ 3. Leachate discharge pipe between the sideslope riser and the tank installed with valves to prevent backflow into the waste disposal area. ✓ 4. Sideslope riser pipe has a minimum diameter of 18 inches and geometry at the junction of the sump and sidewall to assure passage of the pump and hardware and assure correct positioning of the intake of the pump. ✓ 5. The area of the sump and depth of gravel fill are sized to allow remedial installation of access and hardware for removal of leachate if the sideslope riser and pump system fail.	✓			Section 8.9.1, Section 8.9.2, Section 8.9.3	
(k) Are gravity lines transporting leachate out of the landfill constructed with valves for flow control, and are the valves compatible with the leachate and operable from the ground surface?	✓			Section 8.10	
(l) Are all leachate lines located outside the landfill double-cased or in an approved secondary containment?	✓			Section 8.10	
Are all leachate transfer lines proposed to be pressure tested prior to use?	✓			Section 8.9	
Is the upslope end of secondary pipe sealed and the downslope end open to drain into the manhole?	✓			Section 8.9	
(m) Are all leachate transfer lines, manholes, lift stations and other structures outside the waste limits designed to meet the following: ✓ Designed as shallow as practical, and as far from the waste limits as possible so repair of these devices would not infringe on the landfill cover or liner systems ✓ Constructed above the seasonal high groundwater table. __ If not constructed above the water table, is it not technically feasible to do so and does the design meet the requirements of (l) above.	✓			Section 8.10	
(n) Are leachate collection tanks and manholes designed with the following: ✓ Secondary containment to prevent leachate discharge to ground and surface water ✓ Means to monitor the tank or manholes for leaks within the secondary containment __ If no, is an alternative method proposed?	✓			Section 8.10	

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(o) Are the leachate tanks designed to: __ Contain leachate volume generated over a 4 day period, __ Withstand the soil and liquid loads encountered during installation and use __ Follow the consultant and manufacturer installation instructions.	✓			Section 8.10	
(p) Does the leachate loadout station design contain the following: __ Measures to prevent accidental leachate discharge at the loadout from entering ground or surface water, __ A loadout station paved and sloped to a catch basin to direct all spills to a catch basin.	✓			Section 8.10	
(q) Are leachate and gas system manholes and enclosures vented and do they have controlled access?	✓			Section 8.9, Section 8.10, Section 8.13	
For landfills designed with active extraction, are manholes and enclosures designed to minimize air intrusion?	✓			Section 8.9, Section 8.10, Section 8.13	
(r) Are all pumps, valves and meters designed to be controlled and operated from ground surface?	✓			Section 8.9, Section 8.10	
(s) Are all leachate and groundwater collection systems designed to monitor the liquid volume removed?	✓			Section 8.10	
(t) Is there a minimum one foot thick granular drainage blanket placed on top of the geomembrane for a composite liner or on top of the clay component of a clay liner which contains the following elements: __ no more than 5% passing 200 sieve __ If the granular layer contains gravel greater than ¼ “, a certified needle free minimum 12 oz/yd^2 nonwoven geotextile below the drainage blanket	✓			Section 8.8.2.2	
(tm) __ Hydraulic conductivity (at anticipated field density) equal to or greater than 1 cm/sec for sites that accept any amount of MSW or 1x10^{-2} cm/sec for landfills that do not accept MSW __ Was the gradation of the drainage blanket (and associated hydraulic conductivity) selected to maintain the maximum head in the drain within the drain thickness?	✓			Section 8.8.2.2	
(u) If the major horizontal clay lined phase is above the saturated zone, is each phase designed with collection basin lysimeter (except for composite lined landfills)?			✓		

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(6) ADDITIONAL REQUIREMENTS FOR LANDFILLS WITH EXTENDED COLLECTION LINES. Landfills with leachate collection lines that exceed 1,200 feet and will accept MSW must meet the following:					
(a) Do any leachate collection lines exceed 1,200 feet when measured from the end of <u>each</u> cleanout to the toe of the opposite slope? Will the landfill accept MSW? If no, check NA for (b) through (f) below.			✓		
(b) Is the maximum length of each leachate collection line 2,000 feet or less from the access point at one end to the toe of the opposite slope?			✓		
(c) Is the slope on the leachate collection pipe a minimum of 0.5% after accounting for primary and secondary settlement of the subgrade? Note: The minimum design slope is selected following computation of 100% of the primary and secondary consolidation settlement beneath the facility, which includes, as applicable, in-situ soil, added geologic material structural fill material, and compacted clay liner. Secondary settlement shall be calculated using a 100-year timeframe.			✓		
(d) Is the pipe bedding material composed of course, uniform gravel with hydraulic conductivity greater than or equal 1 cm/sec? Note: This requirement is in addition to meeting the other requirements of s. NR 504.06(5)(e).			✓		
(e) Has the maximum anticipated construction, operation and post-closure overburden loads over the leachate collection piping been calculated and used in selecting pipe material and wall thickness? __ Were the calculations based on a 6 inch pipe diameter and appropriate in-field consolidated density?			✓		
(f) Have all components of the leachate collection system incorporated the following design features: __ prefabricated or smooth sweep bends with a minimum radius of 10 pipe diameters __ pipe alignments that minimize horizontal and vertical alignment changes for the entire pipe length __ elimination or minimization of obstructions which impose drag on pipe cleaning jetter hose or nozzles			✓		
(7) COMPOSITE-LINED LANDFILLS USING GCLs.					
Is GCL proposed for use in a composite liner? If no, indicated NA for the following and (a) – (c).			✓		
Does the landfill accept only non MSW waste? Or if it accepts MSW will the GCL be placed over the 4 foot clay liner? If yes to either, the design must meet the requirements of (a) – (c). If no to both, then GCL may not be used as proposed.			✓		
(a) Has the hydraulic performance of the GCL been assessed by use of compatibility testing?			✓		

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(b) Does the GCL meet the specifications of NR 504.07(4)(a)1 to 11?			✓		
(c) Is the GCL underlain by a soil barrier layer a minimum 2 feet thick and meets the specifications of NR 504.07 (4)(a) 12. To 17.			✓		
NR 504.07 MINIMUM DESIGN AND CONSTRUCTION CRITERIA FOR FINAL COVER SYSTEMS.					
(1) GENERAL.					
(a) Is the final cover system designed to? ✓ Minimize leachate generation by limiting the amount of percolation through the cap ✓ Reduce landfill maintenance by design of compatible surface slopes and vegetation ✓ Account for differential settlement and other stresses on the capping layer ✓ Minimize freeze-thaw effects and desiccation of clay capping layer ✓ Provide for removal of leachate and venting of gas from landfills accepting wastes with high moisture content or that which is readily biodegradable	✓			Section 8.14	
(b) Does the final cover system meet the requirements of subs. (2) to (9) below unless it is established (to the satisfaction of the department) that portions of final cover system are not needed based on proposed waste type and design?	✓			Section 8.14	
Is the geomembrane component included in the final cover design unless this is proposed to be an exclusively high volume industrial, or other landfill that does not accept municipal solid waste and is not composite lined?	✓			Section 8.14.3	
(c) If the landfill is designed with a composite liner, is it also designed with a final cover system meeting subs. (2) to (9) below?	✓			Section 8.14	
(d) Does the landfill accept papermill sludge or other industrial solid wastes with high water contents and low strength? Will the strength of the waste prohibit the type of cover system specified in this section (subs. (2) to (9))? If yes, an alternate final cover system may be proposed.			✓		
(2) GRADING LAYER.					
If this is a municipal solid waste landfill, does the design include a 6 inch grading layer above the final waste elevation?	✓			Section 8.14.1	
(3) SUPPORT LAYER AND LOW-STRENGTH WASTES.					
If the landfill accepts industrial wastes with high water content and low strength, does the design include a support layer for stabilization, reinforcement and removal of leachate and gas?			✓		
(4) CLAY CAPPING LAYER.					
__ Does the landfill design include a two foot clay cap that meets the specification of NR 504.06(2)(a) listed below? __ A minimum of 50% by weight passing 200 sieve	✓			Section 8.14.2	

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
__ A saturated hydraulic conductivity of $1x10^{-7}$ cm/sec or less __ An average liquid limit of 25 or greater with no values less than 20 __ An average plasticity index of 12 or greater with no values less than 10 __ Will the clay capping layer be constructed according to NR 504.06(2)(f)?	✓			Section 8.14.2	
(a) If the two foot clay cap is replaced with a GCL and 2 foot soil barrier layer, does it meet the following: __ 1. GCL consist of a layer of bentonite clay between 2 geotextiles __ 2. GCL will be covered with a geomembrane the same day it is placed and in dry conditions __ 3. GCL will be installed in a relaxed condition, free of tension or stress __ 4. Adjoining panels of GCL have a minimum 6 inches overlap on longitudinal seams and a minimum 20 inches of overlap on panel end seams __ 5. Irregular shapes, cuts or tears in the GCL are covered with a GCL patch with a minimum 12 inch overlap __ 6. A seal of loose bentonite granules will be placed in seam overlaps at a minimum rate of 1 quarter pound per linear foot of seam for all seams __ 7. Loose bentonite or bentonite amended soil will be placed at all patches and penetrations __ 8. GCL panels are certified needle-free through magnetic and metal detection tests __ 9. GCL will be placed in direct contact with a soil barrier layer __ 10. Vehicle traffic on subgrade of GCL and on GCL will be restricted to minimum weight and number of machines to deploy GCL and geomembrane; vehicles operated to minimize damage to subgrade, GCL and geomembrane; deployment methods selected to prevent tearing or coming out of fibers of the GCL __ 11. Soil cover placement over the geosynthetics will be completed in the same construction season as the geosynthetic construction __ 12. Soil barrier layer will consist of fine-grained soil or a well graded sandy soil with fines, meeting USCS soil types ML, CL, CH, SM, or SC or dual -symbols classifications of these soils, with 25% by weight passing P200 sieve; upper one foot will have maximum particle size of 2 inches and lower one foot will have maximum particle size of 4 inches __ 13. Soil barrier layer will be compacted in lift heights of no greater than 12 inches after compaction using footed compaction equipment with feet at least 6 inches long; each lift will be disked to break up clods; clods no greater than 4 inches __ 14. Soil barrier layer will be compacted to ensure complete remolding of soil with equipment having a minimum static weight of 30,000 pounds			✓		

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
__ 15. Soil barrier layer will be compacted to 90% modified or 95% standard Proctor density or greater at a moisture content at or wet of optimum __ 16. Each lift of will be keyed into clay or soil barrier layer soils in adjacent phases to form a continuous seal; steps will be a minimum width of 2 feet and there will be a minimum of 2 steps __ 17. The surface of the top lift will be graded or compacted to be smooth and firm and will be inspected for removal of course grave, cobbles and debris prior to placement of GCL			✓		
(b) For industrial waste landfills that predominantly accept compressible wastes or wastes with high water contents and low strength, will the landfill be replacing the clay layer with a GCL overlying a minimum one foot sand layer? If yes, will the gradation of the sand layer be a uniform sand selected to vent gas, drain leachate and provide hydration water to the GCL?			✓		
(c) For industrial waste landfills that predominantly accept ash, will the landfill be replacing the clay layer with a GCL overlying a minimum two feet soil barrier layer? If yes, will the soil barrier layer meet the requirement of (a)13 to 17 above and will the upper foot of soil barrier layer meet the requirements of (a)12 above? Note: The lower foot shall be designed to provide a capillary break between the ash and the upper one foot of soil barrier layer.			✓		
(d) If the lower one foot of the clay layer is replaced with a one foot of foundry green sand system sand, will the sand meet the following: __ Bentonite content of greater than 6% __ Liquid limit of greater than 20 __ Plasticity index of greater than 6 __ Hydraulic conductivity of less than $1X10^{-7}$ cm/sec __ Compaction of 90% modified or 95% standard Proctor density or greater at a moisture content at or wet of optimum			✓		
(5) GEOMEMBRANE LAYER.					
If a geomembrane layer is proposed, does it meet the requirements of NR 504.06(3)(c) to (j) and the following:	✓			Section 8.14.3	
(a) Nominal geomembrane thickness 40 mils or greater, and no thickness measurements below accepted industry tolerance	✓			Section 8.14.3	
(b) Geomembrane installed in direct contact with the clay capping surface	✓			Section 8.14.3	
(c) Geomembrane penetrations fitted with prefabricated collar or a plate welded at the angle of final cover slope, which allows for differential settlement of waste without damage to the membrane seal	✓			Section 8.14.3	

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(6) DRAINAGE ROOTING ZONE LAYER. Does the design include a drainage and rooting zone layer over the geomembrane or the clay cap that meets the following requirements:					
A minimum thickness of 2.5 feet and is not densely compacted	✓			Section 8.14.4, Section 8.14.5	
(a) Drainage layer is designed to be placed immediately above the capping layer and consists of a 1-foot sand layer with a min. hydraulic conductivity of $1x10^{-3}$ cm/sec., or a geosynthetic drain layer of equivalent or greater transmissivity, including: ✓ Design includes an analysis which demonstrates whether the maximum head in the drain layer will be confined within the thickness of the drain, ✓ Drain calculations include infiltration rates based on saturated characteristics of the topsoil and rooting zone, and ✓ Drain calculations include hydraulic gradient of one through the topsoil and rooting zone.	✓			Section 8.14.4	
(b) A perimeter drain pipe at the low end of all final cover sideslopes with the following design elements: ✓ Drain pipe surrounded by a minimum of 6 inches of gravel or sand having a minimum hydraulic conductivity of $1x10^{-2}$ cm/sec ✓ Drain pipe sloped to outlets spaced 200 feet apart unless different spacing is supported by modeling	✓			Section 8.14.4	
(7) TOPSOIL.					
✓ Is a minimum of 6 inches of topsoil included over the cover layer? ✓ Is fertilizer and lime addition proposed per section 630, WDOT or other spec.?	✓			Section 8.14.6, Section 8.14.7	
(8) REVEGETATION.					
✓ Is seed type and fertilizer based upon type and quality of topsoil, and compatibility with the native vegetation and final use? ✓ Is seed mix and application rates per section 630 WDOT specifications unless the department approved different seed mix and application rates? __ Are fertilizer and mulch application rates specified?	✓			Section 8.14.7	
(9) FINAL USE.					
(a) Is final use compatible with the final cover system?	✓			Section 8.19	
(b) Are the following activities prohibited when landfill is no longer in operation? ✓ Use of waste disposal area for agricultural purposes ✓ Establishment or construction of any buildings over the waste disposal areas ✓ Excavation of final cover or any waste materials	✓			Section 8.19	

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
NR 504.075 SOIL BORROW SOURCES.					
(1) GENERAL.					
Is the soil borrow source being developed for the purpose of construction, operating or closing a landfill? If yes, this section applies. Note: Written approval from the department shall be obtained prior to initiating soil borrow activities at any borrow source subject to these requirements.			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(2) EXEMPTIONS. The following activities are exempt from the requirements of this section:					
(a) __ The production of processed aggregate products. __ Excavation of soils from construction projects off of the landfill property and not being used for compacted clay liner or capping layer, soil barrier layer, leachate collection layer or final cover drain layer?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(b) Is the soil borrow source within the proposed or approved limits of filling for a landfill? If yes, then the landfill is not subject to the requirements of subs. (3) and (4)(b).			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(3) INITIAL SITE INSPECTION.					
Does the report include a copy of the department's initial site inspection for each proposed borrow source?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(4) LOCATIONAL INFORMATION.					
(a) Does the submittal describe the following: __Total acreage __ Ownership __ Location (¼-¼ section) __ Present land use __ Transportation routes __ Any access restrictions __ Travel distance to and from landfill			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(b) Does the submittal include the following: __ Surface water drainage patterns __ Significant hydrologic features (surface waters, springs, drainage divides and wetlands) __ Areas of special natural resource interest (critical habitat or state/local natural areas) __ Historical/archaeological areas within and adjacent to proposed limits of excavation			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(5) FIELD AND LABORATORY INVESTIGATIONS FOR CLAY BORROW SOURCES AND SOIL BARRIER LAYER SOURCES.					
Does the submittal for soil borrow sources include field and laboratory investigations to define the physical characteristics of any clay borrow source or soil barrier layer source designated to be used for a liner or final cover?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
Has an alternate geotechnical investigation program been approved by the department in writing prior to the field and laboratory investigation? __ yes __ no If yes, does the report include a copy of and justification for any approved alternative geotechnical investigation program? Note: An alternative geotechnical investigation program may be submitted in cases where previous information exists regarding the proposed soil borrow source.			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(a) Have the required number of test pits or borings been completed on a uniform grid pattern across the proposed borrow source(s)? __ 10 test pits/borings for the first 5 or less acres __ 1 additional test pit/boring for each additional 3 or less acres __ Proposed acreage of proposed borrow source(s) __ Number of test pits/borings required __ Number of test pits/borings made __ Have logs identifying geologic origin, testing results, USCS classification, and visual description of each major soil unit encountered also been included?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(b) Does the report include Atterberg limits and grain size analyses to 0.002 mm particle size for 2 samples from each test pit/boring?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(c) Does the report include the relationship of water content to dry density using either the modified or standard Proctor method (curves must be developed with a minimum of 5 points) for 1 sample from each major soil unit and no fewer than 3 samples for uniform clay deposits?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(d) Does the report include laboratory hydraulic conductivity test results for each sample used to develop the Proctor curves?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(6) STOCKPILING.					
Does the report include discussion of segregating stockpiled soils by USCS soil type, soil gradation, Atterberg limits and compaction specifications? Note: Stockpiling of soils obtained from clay borrow sources and soil barrier layer sources for landfill liner of final cover construction shall be conducted in an organized manner that minimizes mixing of dissimilar soil types. Soils from differing sources may not be commingled unless soil properties are similar.			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(7) DATA PRESENTATION FOR ALL CLAY BORROW SOURCES AND SOIL BARRIER LAYER SOURCES. Does the submittal for soil borrow sources for clay and soil barrier layers include the following?				Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(a) Calculated volume of soil needed and the volume of acceptable soil available			✓		
(b) Property boundaries and test pit/boring locations on a topographic map (scale: 1" = 500') that extends a minimum of 500 feet beyond the proposed borrow source			✓		
(c) Isopach map showing thickness of acceptable soil			✓		
(d) Description of methods for separating acceptable soil from unacceptable soil			✓		
(e) Proposal for maintaining drainage and sedimentation control			✓		
(f) All data from the testing program			✓		
(8) DATA PRESENTATION FOR OTHER BORROW SOURCES. Does the submittal for soil borrow sources other than those used for clay and soil barrier layers include the following?				Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(a) Property boundaries shown on a topographic map (scale: 1" = 500') that extends a minimum of 500 feet beyond the proposed borrow source			✓		
(b) Proposal for drainage and sedimentation control			✓		
(9) STORMWATER MANAGEMENT.					
Does the submittal for a soil borrow source include a stormwater management plan that complies with the requirements of s. NR 504.09(1)(a) to (f) and (h) to (j), unless the borrow source is subject ot other permits with equivalent authority and requirements, such as a stormwater discharge permit or non-metallic mining reclamation permit?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(10) RECLAMATION OR BORROW SITES.					
(a) Does the report include reclamation plans for borrow sources on the landfill property that include the following: __ post-mining land use that is integrated with the existing and proposed drainage __ surface water discharge requirements __ grades and final use of the landfill Is the reclamation plan consistent with NR 135.06 to 135.12?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(b) For soil borrow areas not on landfill property, is the reclamation plan consistent with NR 135? If required, has a reclamation plan been submitted and a nonmetallic mining reclamation permit been received from the appropriate regulatory authority?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(11) OTHER REQUIRMENTS.					
(a) If the proposed clay borrow source(s) contains less than a five foot, but greater than 2 foot uniform clay thickness, does the report contain a construction methodology and documentation procedure to ensure the liner meets the soil index property requirements of s. NR 504.06(2)(a)?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
(b) Does the report include a description of measures to be taken to comply with wetlands protection requirements, runoff and sediment controls and surface water discharge permit requirements and to minimize effects on areas of special natural resource interest and historical or archaeological areas within and adjacent to the proposed limits of excavation?			✓	Section 9, Appendix T	Pre-approved borrow source located on existing owned property
NR 504.08 MINIMUM DESIGN AND CONSTRUCTION CRITERIA FOR LANDFILL GAS EXTRACTION SYSTEMS.					
(1) GENERAL.					
If the landfill has the potential to generate landfill gas, is the landfill designed to prevent the migration of explosive gases generated by the waste?	✓			Section 8.13	Design will be finalized in Plan of Operation
(2) ACTIVE GAS EXTRACTION AND TREATMENT. Does landfill design include an active gas recovery system which includes the following features:					
(a) Vertical gas extraction wells with a maximum 150 foot radius of influence per well with lesser radii of influence on wells near the perimeter Note: The radii of influence of adjacent wells shall overlap. Alternate well spacings may be proposed if site specific data is obtained through performance of pump tests.	✓			Section 8.13, Drawing 27	
(b) Vertical gas extraction wells extending to 10 feet above the leachate collection system, and installed in 36 inch diameter boreholes Note: An exemption may be proposed to allow for placement of gas extraction wells closer to the leachate collection system.	✓			Section 8.13	
(c) The pipe in the boreholes are a minimum 6 inch diameter, Schedule 80 PVC or an approved equal	✓			Section 8.13	
(d) The lower 2/3 to 3/4 of the pipe in the borehole is slotted or perforated pipe	✓			Section 8.13	
(e) Backfill around slotted pipe is one inch to 1 ½ inch washed stone and the top 10 feet of the borehole is sealed	✓			Section 8.13	
(f) Each gas extraction well has a flow control valve and sampling port	✓			Section 8.13	
(g) The header system is looped to allow alternate flow paths for the gas	✓			Section 8.13	
(h) A minimum slope of 2% for header pipes over the waste	✓			Section 8.13	
(i) Polyethylene is used for the header and lateral pipes	✓			Section 8.13	
(j) The blower, header and laterals are sized such that a minimum vacuum of 10 inches of water column is available at the well furthest from the blower	✓			Section 8.13	
(k) A drip leg or equivalent is installed immediately before the blower while preserving suction at the wells under maximum operating vacuum	✓			Section 8.13	

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(l) All condensate and gas transfer piping outside waste limits are encased in 2 feet of clay, double-cased pipe or another approved secondary containment If the piping is not encased is the proposed system designed with multiple drip legs within the landfill where the bulk of the condensate has been removed?	✓			Section 8.13	
(m) The system has the ability to collect and treat all condensate, measure volumes and collect samples	✓			Section 8.13	
(n) A flare designed to meet the requirements of ch. NR 445	✓			Section 8.13	
(3) GAS MONITORING WELLS.					
✓ Does the design provide at least one gas monitoring well on each side of the landfill? ✓ Will the wells be constructed per NR 507.11?	✓			Section 8.18.3	
(4) PASSIVE GAS EXTRACTION SYSTEMS. If the landfill accepts only industrial waste with the potential to generate gas and which does not use an active gas extraction system, is a passive gas venting system proposed which includes the following:			✓		
__ A design that allows gas venting from the entire landfill surface? __ An analysis to determine vent trench spacing for an effective system and to ensure compliance with ch. NR 445 limits for hazardous air contaminants __ A continuous 1 foot layer of granular soil placed under the capping layer with a minimum hydraulic conductivity of $1x10^{-3}$ cm/sec Note: This layer may be part of the support layer required in s. NR 504.07(3). __ A series of flexible, perforated pipes connected to a series of outlets			✓		
NR 504.09 STORM WATER MANAGEMENT AND MISCELLANEOUS DESIGN AND CONSTRUCTION CRITERIA FOR LANDFILLS.					
(1) STORM WATER MANAGEMENT.					
(a) Are drainage ditches, structures and sedimentation basins proposed to be constructed during the initial stages of site construction to control runoff and limit entrained sediment from reaching surface water bodies?	✓			Section 8.16	

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(b) Are the following concepts incorporated in the design of the temporary and permanent erosion and sediment control measures: ✓ Scheduling of grading and construction to minimize soil exposure ✓ Retention of existing vegetation whenever feasible ✓ Seeding and mulching of disturbed areas ✓ Diversion of runoff away from disturbed and active fill areas ✓ Minimization of runoff velocities ✓ Designing drainageways and outlets to handle concentrated and increased flows ✓ Trapping of sediment on-site ✓ Inspection and maintenance of runoff control structures Note: The applicant should submit a copy of the facility's storm water pollution prevention plan (SWPPP) with the plan of operation. The SWPPP may address the items listed above, in addition to storm water or surface water monitoring for the facility.	✓			Section 8.16	
(c) Are the calculations required in pars. (d), (e) and (f) performed for the period in the landfill's development where the surface conditions and contributing acreage would result in the greatest runoff volume?	✓			Section 8.16	
(d) Are all temporary and permanent storm water control structures designed to accommodate peak flow rates from a 25 year, time of concentration storm event?	✓			Section 8.16	
(e) Are the storm water management features designed to accommodate the following: ✓ Temporary and permanent sediment controls are designed to settle the 0.015mm particle size for all storms up to and including the 25 year, 6 hour event? ✓ The sedimentation basin surface area is based upon the average rainfall intensity over the 25 year, 6 hour event? ✓ The principal spillway and outlet protection for the sedimentation basin is designed to pass a 25 year, time of concentration storm event? ✓ The emergency spillway for the sedimentation basin is designed to pass a 100 year, time of concentration event? ✓ The sedimentation basin dewatering structure is designed to drain the basin in less than 3 days __ A design analysis documenting compliance with the above is included	✓			Section 8.16	
(f) Is storm water diverted from active fill and borrow areas to sediment control structures?	✓			Section 8.16	
(g) Are the containment berms around active fill areas designed to comply with the following: ✓ Control and collect runoff from a 25 year-24 hour storm event ✓ Containment analysis is based upon the volume of liquid generated from areas with exposed waste and areas with daily cover __ Storm water in contact with active fill areas will be treated as leachate	✓			Section 8.16	

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(h) Are storm water drainage ditches, structures and sedimentation basins designed to discharge along the existing drainage patterns capable of accepting anticipated flow volume?	✓			Section 8.16	
(i) Has an analysis been performed to determine the amount and velocity of runoff prior to landfill development and to document compliance with above requirement?	✓			Section 8.16	
(j) Does storm water diversion and construction at the landfill minimize impacts on adjacent property?	✓			Section 8.16	
(j) Do storm water management features comply with other applicable requirements such as those of, but not limited to, ch. NR 103 and ch. 30, Stats., permits? Note: The design should also comply with NR 151 storm water requirements.	✓			Section 8.16	
(2) MISCELLANEOUS.					
(a) Is a method of controlling any dust or windblown debris included in the design?	✓			Section 3.9	
(b) Is access restricted through fencing, natural barriers or other methods?	✓			Section 8.4	
(c) Are all access roads, including those in the active area, designed for all weather operation?	✓			Section 4.7, Section 8.3	
(d) Are all access roads used by highway vehicles designed with less than 10% grade?	✓			Section 4.7, Section 8.3	
Is the intersection of the landfill access road with an existing highway designed with sufficient sight distance and minimize traffic interference?			✓		
(e) intentionally left blank			✓		
(f) Is a minimum 100 foot separation distance between the fill limits and the adjacent property line, and a minimum 50 foot distance from landfill excavation or berm and the adjacent property line maintained (excluding storm waste diversion structures)?	✓			Section 3.5	
(g) Is the landfill designed such that final waste grades are reached as soon as possible and open refuse filling area is minimized?	✓			Section 8.17	
(h) Are the final slopes designed to be no less than 5% and no greater than 4H:1V, except for papermill sludge sites which may have a max.6H:1V final slope for papermill and wastewater treatment sludge landfills?	✓			Section 8.14, Drawing 26	
(i) Are a minimum of 2 leachate headwells proposed per major horizontal phase?	✓			Section 8.12	
(j) Is a weight scale supplied (if proposed as a municipal solid waste landfill)?	✓			Section 7.3.7	
(k) Is the landfill designed with properly protected, permanent horizontal and vertical control benchmarks, and are the elevations tied to USGS datum and horizontal control referenced to property boundary?	✓			Drawing 2	

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
NR 504.095 DESIGN CRITERIA FOR LANDFILLS THAT RECIRCULATE LEACHATE					
(1) GENERAL. Leachate recirculation systems shall be designed to meet the following requirements:					
(a) Is the MSW landfill designed with a composite liner and leachate collection system meeting the requirements of NR 504.06? If no, leachate recirculation may not be approved.	✓			Section 8.7, Section 8.8	
(b) Is the leachate recirculation limited to areas of the landfill where the leachate collection drainage blanket has a hydraulic conductivity of 1cm/sec or greater? Note: The department may approve leachate recirculation in existing cells with lower permeability leachate collection blankets, provided that the operator can demonstrate that the maximum leachate head on the liner can be maintained at less than 12 inches and that the recorded leachate head has not exceeded 12 inches in the past.	✓			Section 8.8.2.2	
(c) Is the leachate recirculation limited to areas of the landfill which are connected to the active gas extraction systems where the system is cabpable of collecting the additional gas expected? Note: Active gas extraction shall commence in those areas no later than the initiation of leachate recirculation.	✓			Section 8.8.1	
(d) Is the leachate recirculation distribution system more than 100 lateral feet from the exterior sideslope final grades?	✓			Section 8.8.1	
(e) Will there be a minimum depth of 20 feet of waste maintained between the landfill base and the lowest point of leachate distribution?	✓			Section 8.8.1	
(f) Do the operating controls and instructions for leachate recirculation address the following: ✓ All weather and seasons of operation ✓ Cessation of leachate recirculation upon discovery of seeps, excessive pressures within the waste mass, saturated conditions within the waste mass, inadequate shear strength of the waste mass or other conditions indicative of instability?	✓				
(2) SURFACE APPLICATION.					
(a) Is the leachate distribution system designed so no leachate is introduce into the waste in a manner that causes ponding or surface runoff of leachate (No open surface trenches or ponds)?	✓			Section 8.8.1	
(b) Is the leachate distribution system designed to minimize evaporation of the leachate and volatilization of compounds in leachate?	✓			Section 8.8.1	
(3) VERTICAL DISTRIBUTION SYSTEMS.			✓		
(a) Are the wells designed for leachate recirculation and gas extraction?					
(b) Is the well spacing based on the leachate flow rates, pumping characteristics, permeability of the waste mass, and ability of the waste to accept liquid without being pressurized?					

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(c) Are the leachate distribution wells designed with a surface seal to control odors and landfill gas?					
(d) Are the pumping pressures and pumping intervals for the wells designed to prevent surface emergence of leachate?					
(e) Is the leachate distribution system designed to achieve a uniform distribution of leachate throughout the zone of influence of the wells?					
(f) Are the leachate distribution wells designed to also extract landfill gas?					
(4) HORIZONTAL DISTRIBUTION SYSTEMS.			✓		
(a) Is the leachate distribution piping designed to distribute leachate consistently along its length?					
(b) Is the distribution system designed with a permeable bedding material capable of rapidly dissipating recirculated leachate into the waste mass?					
(c) Is the distribution system designed with bedding material capable of maintaining its structure and characteristics during the expected operation life of the system?					
(d) Is the distribution system designed to operate with specific distribution periods with landfill gas extracted in the interval between those distribution periods and to minimize uncontrolled landfill gas emissions?					
(e) Are the pumping pressures and pumping intervals for the wells designed to prevent surface emergence of leachate?					
NR 504.10 ALTERNATIVE DESIGN CRITERIA FOR LANDFILLS ACCEPTING HIGH VOLUME INDUSTRIAL WASTES.					
This section applies only to landfills designed primarily for high volume industrial waste, wood residue and minor amounts of other waste as approved by the Department. This section applies to all new landfills and to the expansion of existing landfills for which the plan of operation was approved after February 1, 1988.			✓		
(1) GENERAL.					
(a) Has the landfill been designed to either meet the requirements of NR 504.05 to 504.09 or has an alternative design been proposed which meets the following provisions?					
(b) Note: If the applicant does not completed construction of the first major phase of the landfill within 2 years from the date of the plan of operation approval, the applicant shall reapply for approval to construct. The department may require additional conditions or approval and require redesign of the landfill in accordance with state-of-the-art design criteria.					
(c) Does municipal waste which is generated by the process, such as manufacturing process packaging not exceed 10% by weight? Note: If yes, then the landfill may not be subject of the design requirements of s. NR 504.05(1). Household and plant waste not generated as a direct result of the manufacturing process such as office and cafeteria waste, may not be disposed of in a landfill which does not meet the requirements of s. NR 504.05(1).					

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(2) DESIGN CAPACITY.					
Does the design capacity meet NR 504.05(3)?					
(3) DESIGN CRITERIA.					
Does the feasibility study demonstrate that the alternative design adequately protects the public health, welfare and the environment, and the design meets or exceeds the NR 504.04 location and performance standards? If no, then an alternative design may not be approved. Is the alternative design supported with the following types of information:					
(a) Landfill characteristics including regional and specific information on land use, geology, hydrology, hydrogeology and soils					
(b) Waste characteristics such as quantity and physical/chemical analysis of waste and leachate					
(c) Analysis of any design to control geologic/hydrogeologic conditions					
(d) Field demonstration data					
(e) Design and performance data for similarly designed and constructed landfills					
(f) Accepted scientific or engineering analysis or field studies, field plots, research, manufacturer's data or demonstrations					
NR 504.11 MINIMUM DESIGN AND CONSTRUCTION CRITERIA FOR LANDFILLS ACCEPTING RESIDUE PRODUCED BY BURNING MUNICIPAL SOLID WASTE.			✓		
(1) APPLICABILITY. This section applies to landfills designed for residue produced by the burning of municipal solid waste as approved by the department. This section applies to all new and existing landfills.					
(2) LANDFILL DESIGN CRITERIA FOR RESIDUE PRODUCED BY BURNING MUNICIPAL SOLID WASTE.					
(a) If the landfill has proposed to accept municipal solid waste combustor residue that tests below the NR 502.13(6)(g) limits, is it a composite lined monofill cell which follows the following criteria:					
__ Does the composite liner consist of a minimum 60 mil geomembrane overlying a minimum 4 foot thick compacted clay liner meeting NR 504.06 specifications?					
__ Is the monocell designed to separately sample and collect leachate from residue areas?					
__ If an alternate design is proposed, such as a double liner, does the design provide equivalent protection?					
(b) If the landfill is proposed to accept municipal solid waste combustor residue that tests above the limits in NR 502.13(6)(g), does the landfill design include a double composite lined monofill cell which meets the following criteria:					

Facility Name: Vernon County Landfill

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
__ Is there a double composite liner with 2 separate composite liners each with a minimum 60 mil geomembrane liner overlying a minimum 4 foot compacted clay liner meeting NR 504.06 specifications?					
__ Is the composite liner separated by a minimum one foot (detection) layer of granular material?					
__ Are separate leachate collection systems designed above and between the composite liners and is separate leachate sampling and collection from the detection layer possible?					
(c) Note: All landfills which accept municipal solid waste combustor residue shall be approved by the department in accordance with s. NR 514.07 (5) prior to accepting each specific residue waste stream.					

Legal Note: This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Appendix B

WDNR Correspondence Regarding ISI, ISR, and NR 140 Report

B-1 – Vernon County ISI Request September 3, 2021
B-2 – WDNR Vernon County ISI Response December 15, 2020
B-3 – WDNR Vernon County Supplemental ISI Response November 1, 2021
B-4 – Vernon County ISR November 17, 2021
B-5 – WDNR Vernon County ISR Completeness December 17, 2021
B-6 – WDNR Vernon County ISR Opinion February 15, 2022
B-7 – WDNR Vernon County AGIP Acceptance Letter March 30, 2022
B-8 – WDNR Renewed ER Review August 18, 2023

B-1 – Vernon County ISI Request September 3, 2021

Initial Site Inspection Request

Vernon County Landfill

Viroqua, Wisconsin

WDNR License No. 3268

VERSW 157634 | November 4, 2020, Revised September 3, 2021

SEH

Building a Better World for All of Us®

Engineers | Architects | Planners | Scientists

Building a Better World for All of Us®

September 3, 2021

RE: Vernon County Landfill
Initial Site Inspection Request
Viroqua, Wisconsin
WDNR License No. 3268
SEH No. VERSW 157634

Ms. Carolyn Cooper, Hydrogeologist
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711-5367

Dear Ms. Cooper:

Short Elliott Hendrickson Inc. (SEH®), on behalf of the Vernon County Solid Waste Department, is submitting this revised Initial Site Inspection (ISI) report to request the Wisconsin Department of Natural Resources (WDNR) provide a preliminary opinion regarding the suitability of additional area to the north and east of the existing landfill for municipal solid waste landfill expansion development. This ISI Request includes a report narrative supplemented by figures and appendices that provide preliminary expansion information as it relates to compliance with the applicable locational criteria and performance standards of s. NR 504.04 Wisconsin Administrative Code.

This report was prepared in accordance with s. NR 509.04 Wisconsin Administrative Code. We believe the ISI is complete and request your timely review. Should you have any questions or would like to discuss the proposed expansion further, please contact me at 608.498.4844.

Sincerely,

Brian L. Kent, CHMM
Project Manager

x:\uz\v\versw\157634\3-env-stdy-regs\isi_isr\isi\isi revised\isi request revised 09.03.2021.docx

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Initial Site Inspection Request

Vernon County Landfill
Viroqua, Wisconsin

Prepared for:
Vernon County Solid Waste
Viroqua, Wisconsin

Prepared by:
Short Elliott Hendrickson Inc.
329 Jay Street, Suite 301
La Crosse, WI 54601-4034
608.782.3161

I, Darryl R. Heaps, hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.

E-25799		9/3/2021
Darryl R. Heaps, PE, CHMM	PE Number	Date
Senior Engineer		

WISCONSIN
DARRYL R. HEAPS
E-25799-6
ST. PAUL, MN
PROFESSIONAL ENGINEER

9/3/2021	
Brian L. Kent CHMM	Date
Project Manager	

SEH

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Distribution

No. of Copies	Sent to
1	Marty Herrick, PE Waste Management Engineer Wisconsin Department of Natural Resources 3050 Mormon Coulee Road La Crosse, WI 54601
1	Stacie Sanborn Director of Solid Waste Vernon County Solid Waste Department S3705 County Road LF Viroqua, WI 54665
1	WDNR - Bureau of Waste Management 101 S. Webster Street PO Box 7921 Madison, WI 53707
1	Carolyn Cooper, PG Hydrogeologist Wisconsin Department of Natural Resources 3911 Fish Hatchery Road Fitchburg, WI 53711
1	Darryl Heaps, PE SEH 3535 Vadnais Center Drive St. Paul, MN 55110

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Figure 3 – Floodplains and Water Features Within 1-Mile of Horizontal Expansion
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Appendix B ER/NHI Report
Appendix C FAA Correspondence
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Initial Site Inspection Request

Vernon County Landfill

Prepared for Vernon County Solid Waste

1 Introduction

1.1 Purpose

The Vernon County Landfill (WDNR License No. 3268) proposes to expand the existing landfill for disposal of municipal solid waste, commercial and industrial waste. Short Elliott Hendrickson Inc. (SEH®), on behalf of Vernon County (County), is issuing this revised Initial Site Inspection (ISI) report to request additional area to the north and east of the existing landfill be evaluated by the WDNR for the purpose of evaluating compliance with the applicable locational criteria and performance standards specified under s. NR 504.04 Wisconsin Administrative Code. Preliminary soil borings performed in May 2021 encountered shallow bedrock to the west of the active landfill cell. This consideration, along with topographic and property boundary limitations to the west and northwest prompted the area north and east of the existing landfill to be evaluated for landfill development and, therefore, this revised ISI.

An ISI request was submitted to the WDNR on November 4, 2020. The WDNR completed a site inspection on November 18, 2020, and issued a response on December 15, 2020. The WDNR's preliminary opinion regarding the suitability of site location of the original ISI request was the site has potential for landfill development. This ISI is being re-submitted in its entirety and includes additional area to the north and east as well as the original area presented in the November 4, 2020, ISI request.

1.2 Landfill Initial Site Inspection Checklist

Appendix A, "ISI Request Checklist" includes a completed Landfill Initial Site Inspection Request Completeness Checklist (WA1184). The checklist was utilized by SEH to confirm correct and sufficient data is provided to the WDNR in accordance with s. NR 509.04 Wisconsin Administrative Code, and as a quick reference guide to the WDNR reviewer for location of applicable information contained in this report.

2 General Information

The Vernon County Solid Waste Department owns and operates an integrated waste management system on approximately 250-acres located in the Town of Viroqua, Wisconsin. The integrated waste management system includes:

- An approximate 10-acre municipal solid waste landfill, with an approximate design capacity of 590,000 cubic yards (WDNR License No. 3268)
- A closed small sized (50,000 cubic yard) C&D Landfill (WDNR License No. 3712)
- A recyclable material processing and baling facility

2.1 Proposed Operation

The County is proposing to permit a horizontal and vertical expansion for the municipal waste landfill (WDNR License No. 3268). The approximate waste footprint for the proposed expansion is shown on the attached Figure 1 through Figure 5. Please note that the approximate footprint presented is not anticipated to cover the entire area shown, but bounds the areas currently being considered for the expansion. It is anticipated that the proposed expansion footprint will be less than 10-acres. The landfill will continue to accept waste from regional haulers and municipalities located in Vernon County. The proposed expansion is described as following:

- Contiguous horizontal expansion of approximately 10-acres to the west, north, or east (or combination thereof).
- Vertical expansion with a vertical overlay onto the existing landfill.

2.2 Location

The current landfill and proposed expansion are located in the South half of Section 15, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin. The physical address for the Solid Waste Department is S3705 County Road LF, Viroqua, Wisconsin 54665.

2.3 Owner/Applicant

The Owner and Applicant are as follows:

Vernon County Solid Waste Department
C/O Stacie Sanborn, Solid Waste Director
S3705 County Road LF
Viroqua, WI 54665

2.4 Authorized Contacts

Authorized contacts are as follows:

OWNER
Stacie Sanborn, Solid Waste Director
Vernon County Solid Waste Department
S3705 County Road LF
Viroqua, WI 54665
608.634.2900

CONSULTANT
Brian L. Kent, CHMM
SEH
329 Jay Street, Suite 301
La Crosse, WI 54601
608.498.4844

2.5 Present Land Use

Presently the property is utilized for active solid waste disposal relating to the active landfill cell. The property also includes a closed small sized C&D landfill located northeast of the active MSW

landfill. Several buildings are located near the entrance to the property which serve as the scale house, landfill office space, and accommodate the recycling processing operations.

The approximate 22-acres under consideration for the proposed horizontal expansion consist of vacant open grassland, forest, and the existing landfill's sedimentation basin. Portions of the area currently contain soil stockpiles for use in day to day landfill operations.

3 Endangered and Archeological Resources {NR509.04(4)(b)}

3.1 Endangered Resources

The Wisconsin Department of Natural Resources (WDNR) has conducted a review of the area for occurrences of Endangered, Threatened, or Special Concern Species, natural communities, or State Natural Areas in accordance with Wis. Stat. §26.604(4). Per WDNR review and subsequent letter, there are no record of the above occurrences that would be impacted by the proposed project.

A copy of the recent endangered resource report from the WDNR is provide in Appendix B, "ER/NHI Report" for your review.

3.2 Archeologic Resources

As required by Wis. Stat. §44.40, the WDNR performed a review of the area to determine if any known historic, scientific, or archeological areas exist within the vicinity of the proposed facility. As indicated in the attached letter from the WDNR, the review indicates no archeological or historical findings within the proposed landfill property and proposed development site.

A copy of the letter from the WDNR is provided in Appendix B for your review.

4 Base Maps {NR509.04(4)(d)}

Attached Figure 1 through Figure 5 are base maps generated from data provided by the Vernon County Land Information Department and the USGS Avalanche quadrangle maps. Following is a summary of the attached figures relating to the required information.

- Figure 1 - Site Location: Provides location, topography/relief, and surface waters other than man-made storm water basins on the landfill property.
- Figure 2 - Residential and Private Wells Within 1-Mile of Horizontal Expansion: Includes an aerial photograph depicting residences, private wells and landowners within 1-mile of the existing and proposed landfill expansion limits. The attached Table 1, "Adjacent Property Owners" provides a listing of each of the landowners and/or residences located within 1,200 feet of the landfill footprint or contiguous to the landfill property.
- Figure 3 - Floodplains and Water Features Within 1-Mile of Horizontal Expansion: Identifies flood hazard areas and surface water bodies within 1-mile of the existing and proposed landfill expansion limits.
- Figure 4 - Topography Within 1-Mile of Horizontal Expansion: Provides topography for vicinity within 1-mile of the existing and proposed landfill expansion limits. The topography data was provided by the Vernon County Land Information Department and

is more current than the USGS map provided on Figure 1. Note the Figure 4 paper copy submitted with this ISI request is presented at a 1 inch = 500 feet scale per NR 504.04(4)(d).

- Figure 5 - Existing Land Use Within 1-Mile of Horizontal Expansion: Identifies the current land use and category for areas within 1-mile of the existing and proposed landfill expansion limits.

5 Potential Conflicts

Following is a summary of the locational and performance standards specified in s. NR 504.04 Wisconsin Administrative Code, and the compliance status of the proposed expansion relative to the requirements. The attached Table 2, "Locational Criteria and Performance Standard Summary" provides a summary of status of compliance with the locational and performance standards.

5.1 Locational Criteria

As discussed in the following sections, the preliminary review of the locational standard requirements for the proposed horizontal and vertical expansion do not indicate any potential conflicts.

5.1.1 Navigable Lake, Pond or Flowage {s. NR504.04(3)(a)}

The proposed expansion will not be located within 1,000 feet of a navigable lake, pond or flowage. One sedimentation basin is located within the proposed expansion area; however, the rule excludes landfill drainage or sedimentation control structures from the setback requirement. The closest water body to the existing landfill and proposed expansion is the Seas Branch Pond located greater than 4,000 feet to the northeast. According to the WDNR's Surface Water Data Viewer database, the Seas Branch pond is an approximate 11-acre flood control impoundment with poor water quality.

5.1.2 Navigable River or Stream {s. NR504.04(3)(b)}

The proposed expansion will not be located within 300 feet of a navigable river or stream. The closest navigable river or stream is the Seas Branch Stream located greater than 1,000 feet north of the proposed expansion. Additionally, an unnamed intermittent stream is located approximately 700 feet to the east of the proposed expansion. The intermittent stream appears to originate on the landfill property and heads northeast towards the Seas Branch Pond.

5.1.3 Floodplain {s. NR504.04(3)(c)}

As shown on Figure 3, the current landfill and proposed expansion footprint are not located in a flood hazard area or floodplain. The closest floodplain to the landfill footprint is located greater than 1,200 feet to the north in the Seas Branch Valley, which is significantly lower in elevation than the proposed expansion footprint.

5.1.4 State/Federal Highways, Public Park and Natural Areas {s. NR504.04(3)(d}

The existing landfill and proposed horizontal expansion are located greater than 1,000 feet from any State/Federal Highway, public park or natural area. The existing landfill and proposed horizontal expansion are located greater than 12,500 feet east of the right-of-way for US Highway 14/61 and State Highway 27. As indicated on Figure 5, there are no public parks or State natural areas within 1,000 feet of the limits of current landfill or expansion footprint.

5.1.5 Airport Safety {s. NR504.04(3)(e)}

The proposed landfill expansion is located approximately 2.7 miles (>15,840 feet) northeast of the closest runway at the Viroqua Airport and is not located in the approach or departure path for the airport. Since the expansion is located less than 5 miles from the airport, the County has issued a letter dated October 23, 2020 to the Federal Aviation Administration (FAA) notifying them of their intent to expand. A copy of the notification letter is attached in Appendix C, "FAA Correspondence."

Review of applicable regulations regarding landfill siting and expansions near airports indicate that the requirements of 49 USC Section 44718(d) apply only to new municipal solid waste landfills (MSWLF's), which are defined as a municipal waste landfill that was established or constructed after April 5, 2000. Furthermore, FAA Advisory Circular AC No. 150/5200-34A states that 49 USC Section 44718(d) does not apply to the expansion or modification of an existing MSWLF. The current active Vernon County Landfill was first constructed in 1993, therefore exempt from the limitations of 49 USC Section 44718(d).

As part of the last expansion process, Vernon County issued a letter to the FAA on May 29, 2002 notifying interested parties of their intention to expand. In a letter dated June 16, 2002 the FAA responded with a letter concurring with the proposal relative to compatibility standards contained in FAA Advisory Circular AC No. 150/5200-33, with the following conditions:

1. The landfill facility must be properly supervised to assure that the bird populations are not increasing and that appropriate control procedures are being followed.
2. Any increases in bird activity that might be hazardous to safe aircraft operations will result in prompt mitigation actions and/or closure of the landfill
3. The above conditions must be clearly defined via State/Local licensing procedures associated with establishment of the landfill.
4. The landfill owner/operator should develop and implement a Wildlife Hazard Management Plan for operation of the landfill.

A Wildlife Hazard Management Plan (Plan) was included in their Plan of Operation, which has been approved by the WDNR and part of the facility operating record. The Plan utilizes the following strategies:

- Minimization of standing water areas
- Minimization of uncovered waste areas
- Prompt revegetation of disturbed areas outside of the waste footprint
- Utilization of bird harassment techniques, perch deterrents, and avoidance structures, as needed

The FAA does not approve or disapprove of solid waste landfill locations but is primarily concerned about location relative to safety. A response from Mr. Bobb Beauchamp of the FAA was received on March 19, 2021, indicating the FAA concurs with the conclusions presented in the October 23, 2020 letter and has no objection to the proposed expansion. The written response from the FAA is provided in Appendix C. The FAA was contacted again via email on August 31, 2021, to confirm their response remains unchanged with the addition of area to the north and east being considered for landfill expansion. Confirmation has not yet been received as of the date of this report. Written confirmation from the FAA will be provided in the ISR.

5.1.6 Public & Private Wells {s. NR504.04(3)(f)}

As shown on Figure 2, there are no public or private wells located within 1,200 feet of the existing or proposed expansion landfill footprint except for the well serving the landfill office and recycling facility. A variance for the setback requirement for the recycling facility private well was issued to the County prior to constructing the initial landfill cell.

5.1.7 Halocene Era Faults {s. NR504.04(3)(g)}

According to the U.S Geological Survey (USGS) Earthquake Hazards Program Interactive Fault Map, there are no faults within the vicinity of the active or proposed expansion footprint. Appendix D, “USGS Maps” includes a map from the interactive mapping system showing known faults in the Midwest Region of the United States.

5.1.8 Seismic Impact Zones {s. NR504.04(3)(h)}

According to the USGS Earthquake Hazards Program U.S Seismic Hazards Map, the active or proposed expansion footprint, and most of Wisconsin in general, is located in an area of very low seismic hazard. Appendix D includes a copy of the USGS Seismic-Hazard Maps for the Conterminous United States, 2014.

5.1.9 Unstable Areas {s. NR504.04(3)(i)}

There is no known current or historic data for the site that would suggest that the current landfill or proposed expansion footprint is located in an unstable area. Further discussion relating to stability will be addressed in the Feasibility Report.

5.2 Performance Standards

As discussed in the following sections, the preliminary review of the performance standard requirements for the proposed horizontal and vertical expansion do not indicate any potential conflicts.

5.2.1 Impacts to Wetlands {s. NR504.04(4)(a)}

The proposed expansion will not have a significant adverse impact on wetlands. There are no wetlands present in the expansion area and storm water run-off from the area during construction and operation will be managed in accordance with applicable storm water regulations.

5.2.2 Endangered and Threatened Species {s. NR504.04(4)(b)}

The proposed expansion will not include a “take” of an endangered or threatened species. Please refer to Section 3 and Appendix B for more detail.

5.2.3 Detrimental Effects to Surface Water {s. NR504.04(4)(c)}

The proposed expansion will not have a detrimental effect on surface water quality assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. Surface water will be managed in accordance with applicable regulations and surface water management systems will be designed and maintained in accordance with industry best management practices. Details of the storm water management system design including any modifications to existing storm water structures will be provided in the Feasibility Report.

5.2.4 Detrimental Effects to Groundwater {s. NR504.04(4)(d)}

The proposed expansion will not cause or exacerbate an attainment or exceedance of a groundwater quality standard assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. The expansion will include a “state of the art” landfill liner and leachate collection system to prevent the release of contamination to the subsurface and groundwater. Details of the landfill design will be provided in the Feasibility Report.

5.2.5 Migration of Explosive Gas {s. NR504.04(4)(e)}

The proposed expansion will not cause the migration of explosive gases in excess of 25 percent of the lower explosive limit (LEL) assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. The expansion will include a “state of the art” landfill liner and expansion of the landfill gas collection system to minimize the migration and fugitive emission of methane to the atmosphere and subsurface. Details of the landfill design will be provided in the Feasibility Report.

5.2.6 Hazardous Air Emissions {s. NR504.04(4)(f)}

The proposed expansion will not cause the emission of any hazardous air pollutant (HAP) exceeding the limitations contained in s. NR445.07 Wisconsin Administrative Code assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. Details of the landfill gas collection and monitoring system design will be provided in the Feasibility Report.

DRH/hbh

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Tables

Table 1 – Adjacent Property Owners
Table 2 – Locational Criteria and Performance Standards Summary

Table 1

Adjacent Land Owners

MAP ID	PARCEL ID	OWNER	OWNER 2	POSTAL ADDRESS	SITE ADDRESS
1	036-00411-0000	RANDY D & KAREN M CRUME		E8284 SEAS BRANCH RD, VIROQUA, WI, 54665	
2	036-00393-0000	RANDY D & KAREN M CRUME		E8284 SEAS BRANCH RD, VIROQUA, WI, 54665	E8284 SEAS BRANCH RD
3	036-00410-0000	ALVIN L WOODMANSEE	C/O SUSAN WOODMANSEE	201 N WALBRIDGE AVE 111, MADISON, WI, 53714	
4	036-00408-0000	PAULINE A BUCKLAND		PO BOX 174, VIROQUA, WI, 54665	
5	036-00379-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
6	036-00381-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
7	036-00674-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
8	036-00638-0000	MADELINE CLEMENTS	STEVEN & DEBRA CLARK	210 N WASHINGTON, VIROQUA, WI, 54665	E8454 N ASBURY RD
9	036-00637-0000	WISCONSIN RSA #8	LIMITED PARTNERSHIP	8410 W BRYN MAWR AVE, CHICAGO, IL, 60631	
10	036-00635-0000	ZION CHURCH			
11	036-00645-0000	JEROME J & SHARON M BUTERA		E8449 N ASBURY RD, VIROQUA, WI, 54665	E8449 N ASBURY RD
12	036-00644-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
13	036-00642-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
14	036-00643-0000	JOHN & LINDA KIELER REVOCABLE TRUST		748 COUNTY RD Z, HAZEL GREEN, WI, 53811	
15	036-00641-0000	ROBERT J & TAMMY L MENNE		E8327 N ASBURY RD, VIROQUA, WI, 54665	E8327 N ASBURY RD
16	036-00652-0000	JOHN & LINDA KIELER REVOCABLE TRUST		748 COUNTY RD Z, HAZEL GREEN, WI, 53811	
17	036-00647-0000	CHAD B WILLIAMS		E7541 COUNTY RD SS, VIROQUA, WI, 54665	E8263 N ASBURY RD
18	036-00650-0000	JOHN & LINDA KIELER REVOCABLE TRUST		748 COUNTY RD Z, HAZEL GREEN, WI, 53811	
19	036-00649-0001	WAYNE K KRUIZENGA	JULIE KRUIZENGA	E8107 COUNTY RD LF, VIROQUA, WI, 54665	
20	036-00406-0000	ALICE MAE NELSON		E8137 COUNTY RD Y, VIROQUA, WI, 54665	
21	036-00405-0000	ALICE MAE NELSON		E8137 COUNTY RD Y, VIROQUA, WI, 54665	E8137 COUNTY ROAD Y
22	036-00404-0000	GRACE ACRES LLC		E8219 COUNTY RD Y, VIROQUA, WI, 54665	
23	036-00402-0000	GRACE ACRES LLC		E8219 COUNTY RD Y, VIROQUA, WI, 54665	E8219 COUNTY ROAD Y

Table 2
Locational Criteria and Performance Standard Summary

Locational/Performance Criteria	Wisconsin Administrative Code	Compliance (Y or N)	Remarks
Locational Criteria			
1,000 ft from any navigable lake, pond or flowage	NR 504.04(3)(a)	Y	Refer to Section 5.1.1
300 ft from any navigable river or stream	NR 504.04(3)(b)	Y	Refer to Section 5.1.2
Floodplain	NR 504.04(3)(c)	Y	Refer to Section 5.1.3
1,000 ft of the nearest R/O/W of any state trunk, interstate or federal aid highway or boundry of a public park unless the landfill is screened	NR 504.04(3)(d)	Y	Refer to Section 5.1.4
Airport Safety	NR 504.04(3)(e)	Y	Expansion of an existing landfill is exempt from the minumum setback requirements. (Refer to Section 5.1.5)
Within 1,200 ft of a private water supply well	NR 504.04(3)(f)	Y	Refer to Section 5.1.6
Within 200 ft. of a fault that has had displacement in Holocene time	NR 504.04(3)(g)	Y	Refer to Section 5.1.7
Within Seismic Impact Zones	NR 504.04(3)(h)	Y	Refer to Section 5.1.8
Within Unstable Areas	NR 504.04(3)(i)	Y	Refer to Section 5.1.9
Location Criteria Base Map	NR 504.04	Y	Refer to Figure 1 through Figure 5 and Section 4
Performance Standards			
A significant adverse impact on wetlands as provided for in NR 103	NR 504.04(4)(a)	Y	Refer to Section 5.2.1
A take of an endangered or threatened species	NR 504.04(4)(b)	Y	Refer to Sections 3 and 5.2.2
A detrimental effect on surface water	NR 504.04(4)(c)	ND	Pending design and maintenance of storm water management systems. (Refer to Section 5.2.3)
A detrimental effect on groundwater quality…	NR 504.04(4)(d)	ND	Pending landfill design and analysis of groundwater data in the feasibility report. (Refer to Section 5.2.4)
Migration and concentration of explosive gas…in excess of 25% of the LEL…	NR 504.04(4)(e)	ND	Pending landfill and landfill gas collection system design in the feasibility report. (Refer to Section 5.2.5)
Emissions of any hazardous air contaminants excess of 25% LEL.	NR 504.04(4)(f)	ND	Pending landfill and landfill gas collection system design in the feasibility report. (Refer to Section 5.2.6)

Notes:
Y= Yes
ND= Not Determined- Determination to be proviced in future submittals

Figures

Figure 1 – Site Location
Figure 2 – Residential and Private Wells Within 1-Mile of Horizontal Expansion
Figure 3 – Floodplains and Water Features Within 1-Mile of Horizontal Expansion
Figure 4 – Topography Within 1-Mile of Horizontal Expansion
Figure 5 – Existing Land Use Within 1-Mile of Horizontal Expansion

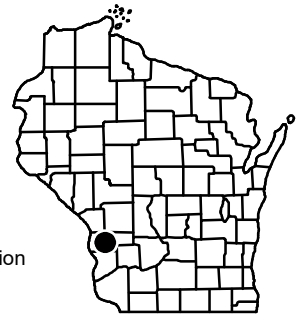
REPRODUCED FROM

USGS AVALANCHE QUADRANGLE

WISCONSIN - VERNON CO. 7.5 MINUTE SERIES

1983

TOWNSHIP: 13
RANGE: 4
SECTION: 15 & 22



N
W E
S

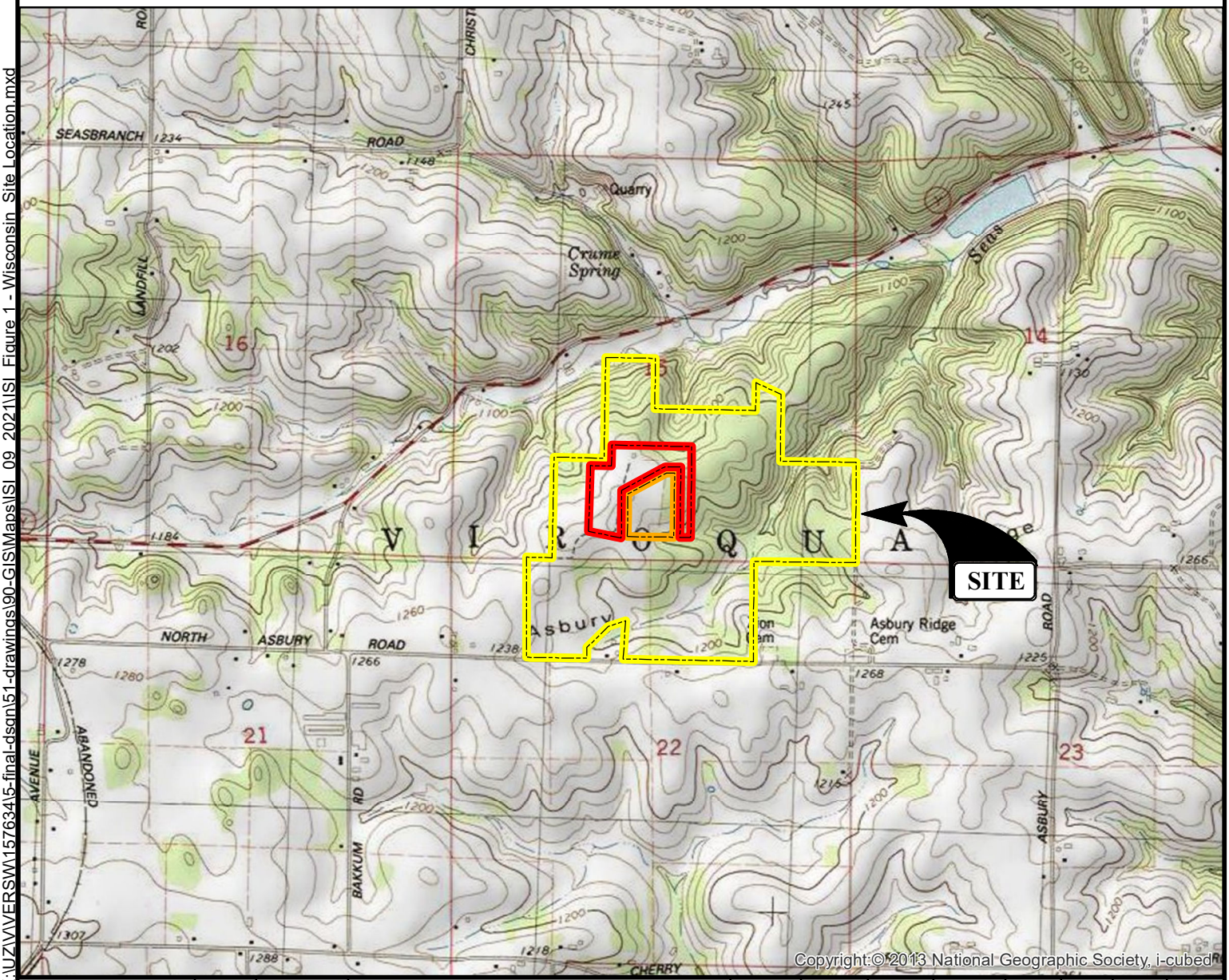
0 1,000 2,000 Feet

1 inch = 2,000 feet

Legend

- Landfill Property Boundary
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Landfill Expansion

USGS MAPS AND DATA COPYRIGHT 2007, MAPTECH®



NO.	DATE	ISSUES/REVISIONS	DRAWN BY		DESIGN		FIELD REVIEW		QC CHECK	
1	10/22/2020	ISI REQUEST	RJH	10/20	RJH	10/20			BLK	10/20

SEH

ISI REQUEST
VERNON COUNTY LANDFILL
(WIDNR LICENSE NO.3268)

FIGURE 1
SITE LOCATION

PROJ. NO. VERSW157634
DATE 09/01/2021

Figure 1

Document Path: X:\UZ\VERSW\157634\5-final-dsgn\51-drawings\90-GIS\Maps\ISI_09_2021\ISI_Figure 1 - Wisconsin_Site Location.mxd

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Appendix A

ISI Request Checklist

LANDFILL INITIAL SITE INSPECTION REQUEST
COMPLETENESS CHECKLIST

SECTION NR 503.07, WISCONSIN ADMINISTRATIVE CODE – C&D AND ONE-TIME DISPOSAL LANDFILLS
SECTION NR 509.04, WISCONSIN ADMINISTRATIVE CODE – ALL OTHER LANDFILLS

Refer to Applicable Codes for Exact Requirements

General Information

Applicant:

Applicant Name: Vernon County Landfill

Contact/Title: Stacie Sanborn

Address: S3705 County Road LF, Viroqua, WI

Phone #: 608-634-2900

FID #: 6630308310

Site Location: South ½ of Section 15, T13N, R4W
Town of Viroqua, Vernon County, WI

Date of Initial Site Inspection Request: 09/03/2021

Consultant:

Consultant Name: SEH

Contact/Title: Brian Kent

Address: 329 Jay Street Suite 301, La Crosse, WI

Phone #: 608-498.4844

Date Project Entered into FIST System: _____

Date ISI is Due (Max. 22 bus. Days after receipt of request):

_____

Legal Note:
This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

GENERAL SUBMITTAL REQUIREMENTS - NR 503.07(2) or 509.04(2)	Y	N	NA	LOCATION	COMMENTS
1. Report sent to region and central office	x				see distribution list
2. Current standard technical procedures used and test methods specified – NR 500.05(5)			x		Not applicable
3. Visuals - NR 500.05(6)					
a. 8.5x11 to 32x44 inches in size	x				
b. Appropriate scale to show all required details with sufficient clarity	x				
c. Be numbered; referenced in the narrative; have a title, legend, horizontal and vertical scales; and drafting or origination dates	x				
d. Uniform scales	x				
e. North arrow	x				
f. Mean sea level as basis for all elevations	x				
g. Survey grid based on field monuments and utilizing a coordinate system acceptable to the department	x				
h. Original topography and grid system on plan sheets showing construction, operation or closure topography				x	
i. Cross-sections include survey grid location, reference to major plan sheets and reduced diagram of cross-section location plan view map				x	
3. Table of contents – NR 500.05(7)	x				
4. Appendix listing all references, raw data, testing and sampling procedures and calculations – NR 500.05(8)	x				

LANDFILL REQUEST MINIMUM REQUIREMENTS - NR 503.07(4) or 509.04(4)	Y	N	NA	LOCATION	COMMENTS
1. Cover Letter					
a. Applicant identified	x				Section 2.3
b. Authorized contact identified	x				Section 2.4
c. Current property owner identified	x				Section 2.3
d. Type of landfill being proposed	x				Section 2.1
e. Project location by ¼, ¼ section	x				Section 2.2
f. Present land use	x				Section 2.5
2. Known potential impacts to endangered and threatened species - NR 29	x				Section 3.1
3. Known potential impacts to historic, scientific or archeological areas, including prior studies or surveys, identified - s. 44.40, Wis. Stats.	x				Section 3.2
4. Enlarged 7.5 minute USGS map or equivalent (minimum 1"=500')					
a. Ground surface relief within one mile of project	x				Figure 1 and Figure 4
b. Surface water bodies within one mile of project	x				Figure 3
c. Floodplains within one mile of project	x				Figure 3
d. Existing land use within one mile of project	x				Figure 5
e. All water supply wells and residences within one mile of project	x				Figure 2
5. Preliminary identification of all potential conflicts with locational criteria and performance standards in: ● for C&D and one-time disposal landfills, NR 503.04 ● for all other landfills, NR 504.04 excluding NR 504.04(4)(d) to (f)	x				Sections 5.1 and 5.2

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Appendix B

ER/NHI Report

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg WI 53711-5397

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

August 31, 2021

Brian Kent
SEH
bkent@sehinc.com
608-498-4844

SUBJECT: RE: ER/NHI Review – Vernon County, Wisconsin
Vernon County Landfill v3

Dear Brian Kent:

Per your request, I have reviewed a parcel for potential ecological resources of concern and archaeological sites in Vernon County located in the S ½ of Section 15, Township 13 North, Range 4 West in the Town of Viroqua.

There are no concerns for ecological resources of concern within this reviewed parcel area. There were no elemental occurrences within the 2-mile buffer.

There are no concerns for archaeological or historical sites within this reviewed parcel.

Please include this letter and attachments with future permit submittals to the WDNR.

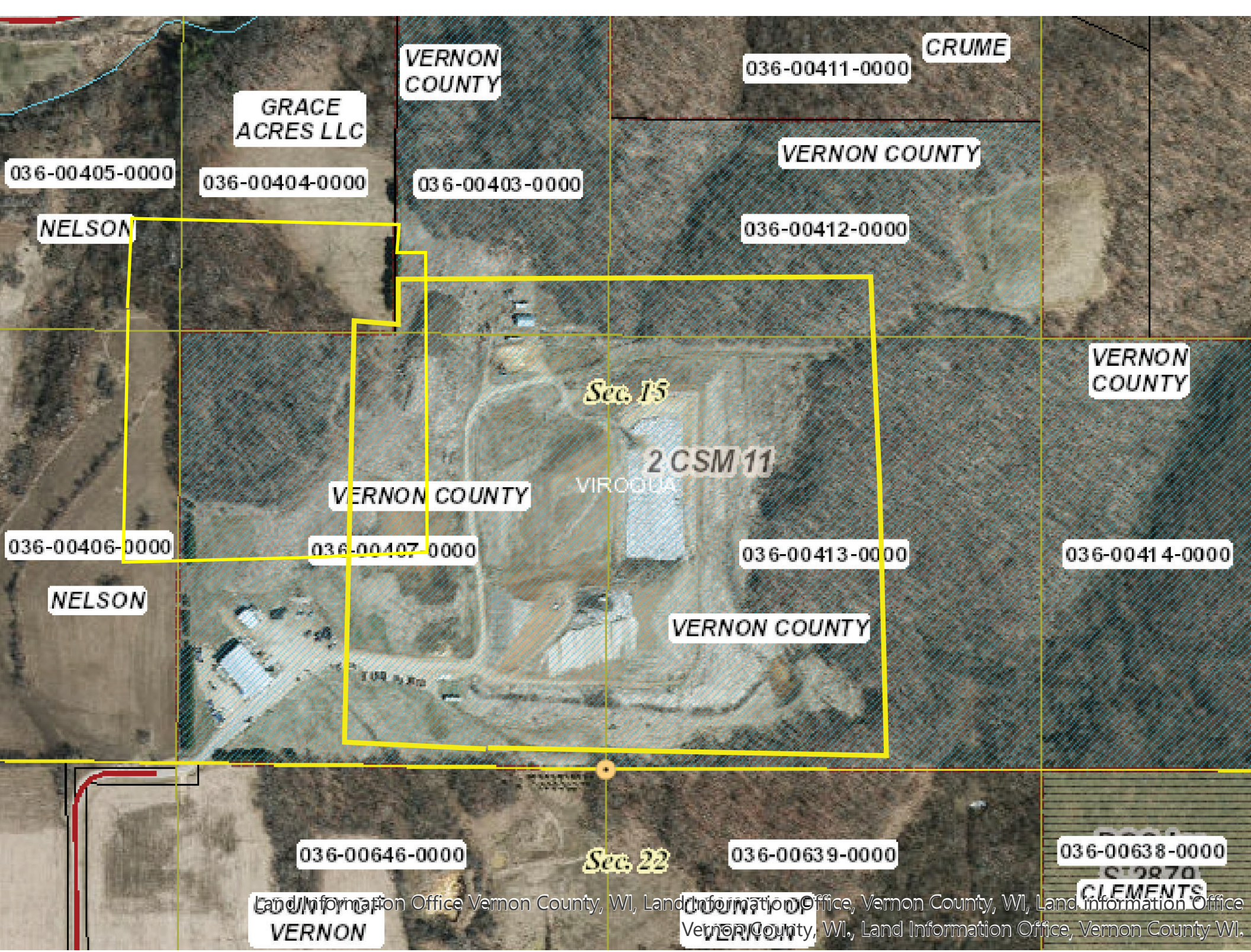
Sincerely,

Laura Spears

Laura Spears
Wastewater Specialist – Stormwater
South Central Region – Dodgeville Office

Attached: parcel location map, 2020 aerial image, NHI review

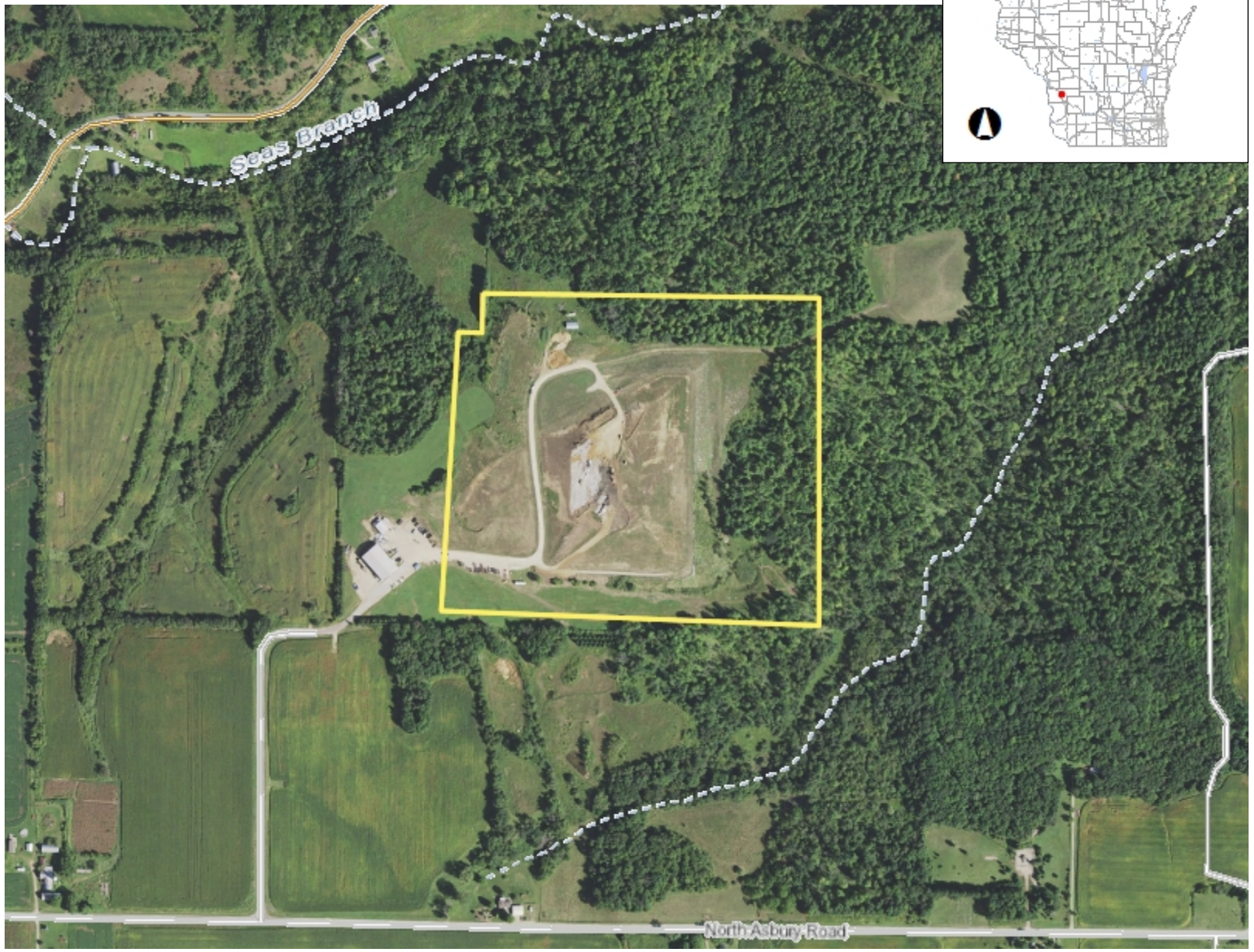
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Land Information Office Vernon County, WI, Land Information Office, Vernon County, WI, Land Information Office
Vernon County, WI., Land Information Office, Vernon County WI.

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Vernon County Landfill v3





Legend

- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

Notes

2020 Aerial

0.3 0 0.13 0.3 Miles

NAD_1983_HARN_Wisconsin_TM

1: 7,920

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/

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Endangered Resources Review for the Proposed Vernon County Landfill v3, Vernon County

Vernon County Landfill v3

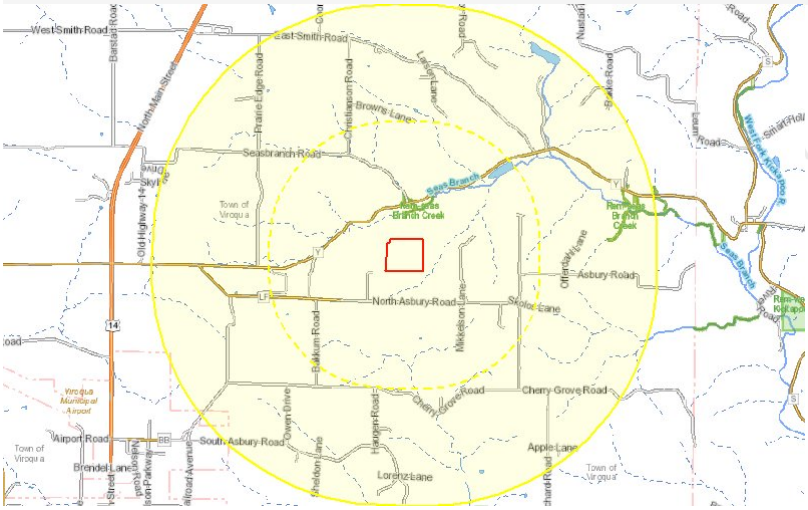
Reviewer Information

Reviewer Name	Laura Spears
Review Date	8/31/2021
Bureau / Org Name	Watershed Management
Work Station	Iowa

General Information

Project Title	Vernon County Landfill v3
Project No	
Federal Nexus	
Project Timing	
Property Type	

Map



Project Location

County	Vernon
PLSS Description	T13N R04W S15
Township Name	Viroqua
Ownership Type	
Landowner Name	

Project Information

Description	expanded area of the Vernon County Landfill
Habitat Description	expansion/improvements to existing landfill
Impacts to Wetlands and Waterbodies	
Additional DNR and Other Permits	

Element Occurrences

No element occurences exist in this area

Actions that need to be taken to comply with state and/or federal endangered species laws: **None**

Actions recommended to help conserve Wisconsin's Endangered Resources: **None**

Additional Recommendations: **None**

No actions are required or recommended for the following endangered resources: **None**

Disclaimer

This ER Review may contain Natural Heritage Inventory data (http://dnr.wi.gov/topic/NHI), including specific locations of endangered resources, which are considered sensitive and are not subject to Wisconsin's Open Records Law. As a result, information contained in this ER Review may be shared only with individuals or agencies that require this information in order to carry out specific roles in the permitting, planning and implementation of the proposed project. Specific locations of endangered resources may not be released or reproduced in any publicly disseminated documents.

Details related to project location, design, and timing of disturbance are important for determining both the endangered resources that may be impacted by the project and any necessary follow-up actions. If the project plans change, new details become available, or more than a year passed, please renew this review.

Confidential

Appendix C

FAA Correspondence

From: Beauchamp, Bobb (FAA)
To: Brian Kent
Subject: RE: Vernon County Landfill
Date: Friday, March 19, 2021 2:20:11 PM

Mr. Kent,

This email is responding to your October 23, 2020 notification of a proposed horizontal expansion at the Vernon County Landfill. Your notification was to meet provisions and requirements of:

- s. NR504.04(3)(e) Wisconsin Administrative Code
- 40 CFR 258.10 –Airport Safety
- 49 USC Section 44718(d), as amended by Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L No. 106-181 (April 5, 2000)
- FAA Advisory Circular AC No. 150/5200-34A (January 26, 2006) : Construction or Establishment of Landfills Near Public Airports
- FAA Advisory Circular AC No. 150/5200-33B (August 28, 2007) : Hazardous Wildlife Attractants On Or Near Airports

This e-mail of course only responds on behalf of the FAA and the Federal provisions shown above.

We concur with your conclusion that the provisions of 49 USC 44718(d) do not apply to this proposed expansion of the Vernon County Landfill. These provisions specifically do not apply to landfills that were constructed or in operation prior to April 5, 2000. The Vernon County Landfill was first constructed in 1993. In addition, the Viroqua Airport does not have regularly scheduled service in addition to general aviation operations, so the provisions of FAA AC 150/5200-34A, Construction or Establishment of Landfills Near Public Airports do also not apply.

Regarding the provisions of FAA Advisory Circular No 150/5200-33B, Hazardous Wildlife Attractants On Or Near Airports: The Landfill is outside the 10,000' area of primary concern identified in the AC. While FAA encourages the Landfill to continue its efforts under their Wildlife Hazard Management Plan, we recognize that FAA does not have regulatory or approval authority over the Landfill in this regard.

Based on the above, FAA has no objection to the proposed expansion at the Vernon County Landfill. Please feel free to contact me if you have any questions or additional concerns.

From: Brian Kent <bkent@sehinc.com>
Sent: Thursday, March 18, 2021 4:02 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: RE: Vernon County Landfill

Thank you

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
Building a Better World for All of Us®
Follow SEH on Twitter | Facebook | LinkedIn | Instagram

From: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Sent: Thursday, March 18, 2021 1:46 PM
To: Brian Kent <bkent@sehinc.com>
Subject: RE: Vernon County Landfill

Brian, I apologize for not getting back to you. I'll do my best to get you a more formal response by end of day tomorrow.

From: Brian Kent <bkent@sehinc.com>
Sent: Thursday, March 18, 2021 1:38 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: FW: Vernon County Landfill

Hi Bobb-
I apologize for my persistence but I am following up to check on the status of your response. Your response is needed as part of our permitting process and we are needing to get this to the WDNR in the very near future. Please reply at your earliest convenience. Thank you.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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From: Brian Kent
Sent: Tuesday, March 2, 2021 9:55 AM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: RE: Vernon County Landfill

Hi Bobb-
I hope all is well. Just following up with the below email correspondence. I have not received a formal response and wondering if it perhaps was misplaced? Thanks much.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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From: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Sent: Tuesday, December 29, 2020 3:08 PM
To: Brian Kent <bkent@sehinc.com>
Subject: RE: Vernon County Landfill

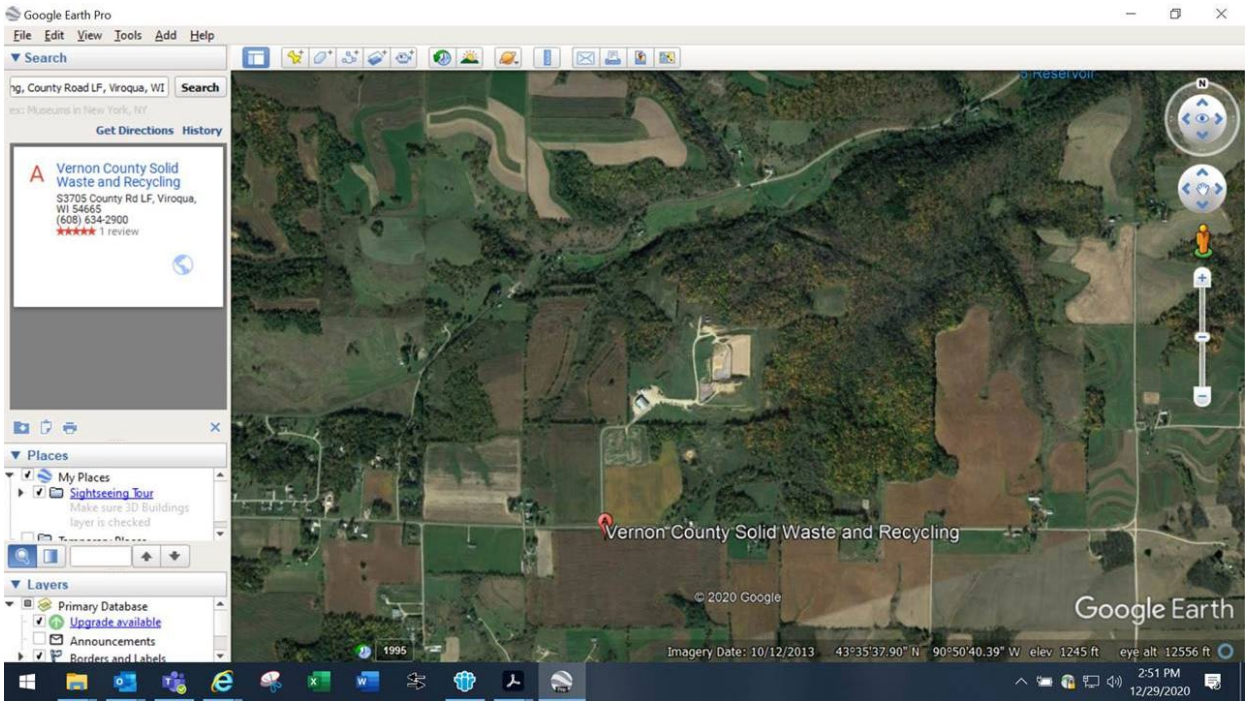
Great, that's the same facility I'm looking at.

Informally the expansion is exempt from 49 USC Section 44718(d) for 2 reasons: the expansion is of an existing landfill, and the Viroqua airport does not have regularly scheduled service in addition to general aviation. It's also outside the 10,000' area of primary concern put forth in FAA's Advisory Circular 150/5200-33B.

I'll work on a formal response email later this week.

From: Brian Kent <bkent@sehinc.com>
Sent: Tuesday, December 29, 2020 2:53 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: RE: Vernon County Landfill

Yes- below is a screen shot of what shows up for me.



Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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From: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Sent: Tuesday, December 29, 2020 2:14 PM
To: Brian Kent <bkent@sehinc.com>
Subject: RE: Vernon County Landfill

Hi Brian,

I'm also working remotely, and it's been impacting my normal ability to evaluate landfill requests such as this. Can you confirm that the facility identifies as Vernon County Solid Waste and Recycling on Google Earth?

From: Brian Kent <bkent@sehinc.com>
Sent: Tuesday, December 29, 2020 1:52 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: Vernon County Landfill

Bobb-
Attached is the letter SEH issued on October 23, 2020 providing notification of Vernon County's plan to expand their existing municipal waste landfill. I had not heard anything yet so I figured I better check on the status. Please feel free to contact me to discuss should you have any questions or issues. Please note I am working remotely due to COVID. If you prefer to call, please call my cell number at 715.456.4621. Also, if you already responded by mail it is possible that I have not received it yet since it takes a while to get my mail with our office being closed. Thanks in advance for your response.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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October 23, 2020

RE: Vernon County Landfill
Proposed Landfill Expansion (WDNR License No. 3268)
SEH No. VERSW 157634 14.00

FAA Airport Division
AGL - 600
2300 East Devon Avenue
Des Plaines, IL 60018

Dear Sir or Madam:

Short Elliott Hendrickson Inc. (SEH) is submitting this letter on behalf of Vernon County to notify the Federal Aviation Administration (FAA), and other concerned parties, of the County's proposed expansion of the Vernon County Landfill (WDNR License No. 3268). This notification is being provided to meet the provisions and requirements outlined in the following State and Federal Rules and guidance:

- s. NR504.04(3)(e) Wisconsin Administrative Code
- 40 CFR 258.10 –Airport Safety
- 49 USC Section 44718(d), as amended by Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L No. 106-181 (April 5, 2000)
- FAA Advisory Circular AC No. 150/5200-34A (January 26, 2006) : Construction or Establishment of Landfills Near Public Airports
- FAA Advisory Circular AC No. 150/5200-33B (August 28, 2007) : Hazardous Wildlife Attractants On Or Near Airports

The proposed Vernon County Landfill Expansion (Landfill Expansion) is located in the Southern Half of Section 12, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin. The proposed horizontal landfill expansion encompasses approximately 10-acres due west and north and contiguous to the current permitted landfill. As shown the Attached Figure 1, "Site Location" the landfill expansion is located approximately 2.8 miles northeast of the closest runway at the Viroqua Municipal Airport and the existing landfill and expansion are not located in the approach or departure path for the airport.

The limitations of 49 USC Section 44718(d) apply to new municipal solid waste landfills (MSWLF's), which are defined as a municipal waste landfill that was established or constructed after April 5, 2000. Additionally, FAA Advisory Circular AC No. 150/5200-34A states that 49 USC Section 44718(d) does not apply to the expansion or modification of an existing MSWLF. The current active Vernon County Landfill was first constructed in 1993, therefore exempt from the limitations of 49 USC Section 44718(d).

As part of the last expansion process, Vernon County issued a letter to the FAA on May 29, 2002 notifying interested parties of their intention to expand. In a letter dated June 16, 2002 the FAA responded with a letter concurring with the proposal relative to compatibility standards contained in FAA Advisory Circular AC No. 150/5200-33, with the following conditions:

1. The landfill facility must be properly supervised to assure that the bird populations are not increasing and that appropriate control procedures are being followed.
2. Any increases in bird activity that might be hazardous to safe aircraft operations will result in prompt mitigation actions and/or closure of the landfill
3. The above conditions must be clearly defined via State/Local licensing procedures associated with establishment of the landfill.
4. The landfill owner/operator should develop and implement a Wildlife Hazard Management Plan for operation of the landfill.

A Wildlife Hazard Management Plan (Plan) was included in their Plan of Operation, which has been approved by the WDNR and part of the facility operating record. The Plan utilizes the following strategies:

- Minimization of standing water areas
- Minimization of uncovered waste areas
- Prompt revegetation of disturbed areas outside of the waste footprint
- Utilization of bird harassment techniques, perch deterrents, and avoidance structures, as needed

We understand that the FAA does not approve or disapprove of solid waste landfill locations but is primarily concerned about location relative to safety. We request that you review this letter and attachments and reply with your assessment of the proposed landfill expansion. Please contact me at 608.498.4844 with any questions or concerns.

Sincerely,

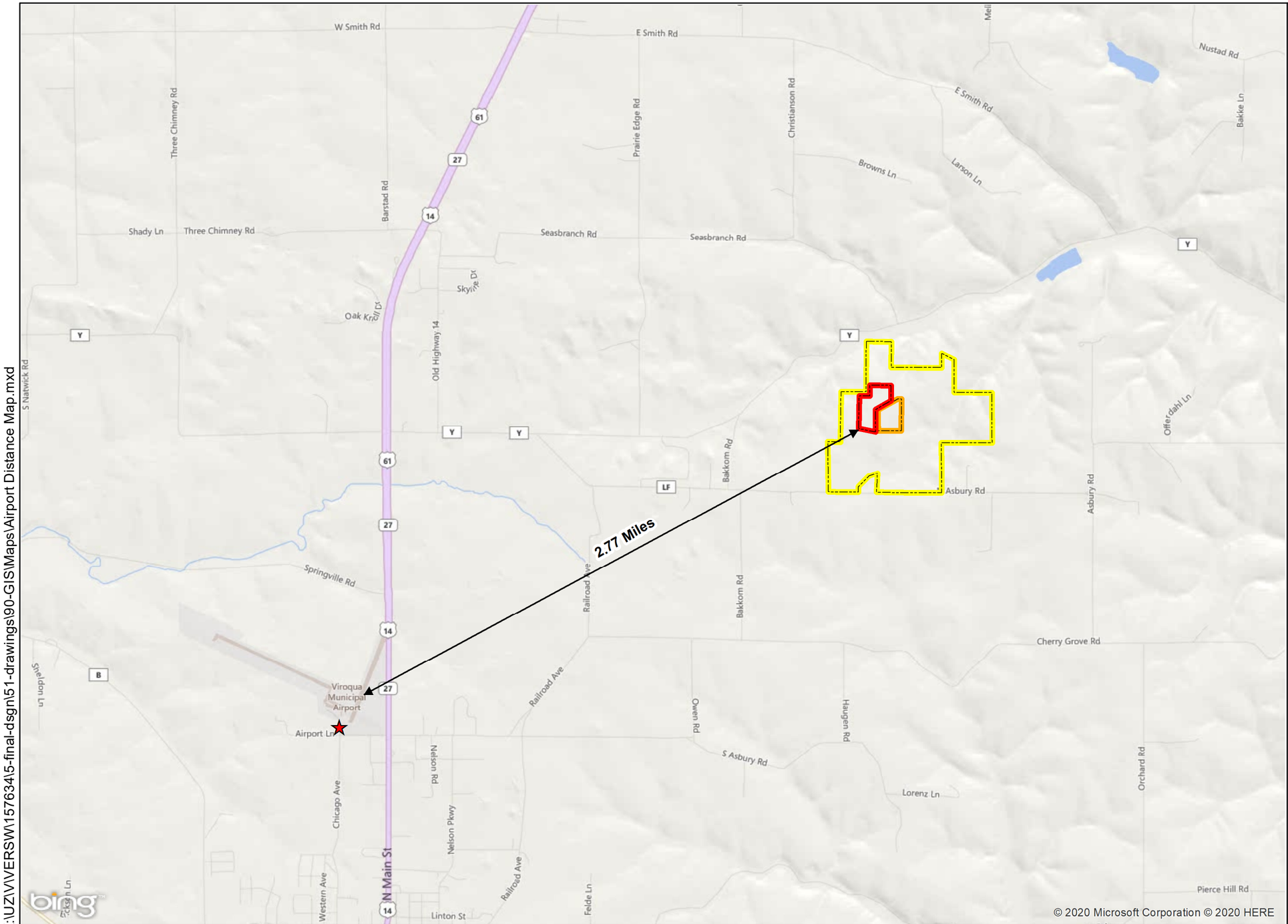
SHORT ELLIOTT HENDRICKSON INC.



Brian L. Kent, CHMM
Project Manager

BLK
Attachment
c: Stacie Sanborn, Vernon County Solid Waste (electronic)
Stacey Miller, Wisconsin DOT, Bureau of Aeronautics
Michael Skildum, Viroqua Municipal Airport Manager
Darryl R. Heaps, SEH (electronic)

x:\uz\v\versw\157634\3-env-stdy-regs\isi_isr\faa_airport\versw_faa notification letter 10.23.2020.docx



Legend

- Landfill Property Boundary
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Landfill Expansion

N
W E
S

0 0.25 0.5 1 Miles

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
rjh

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. If errors or discrepancies are found please contact SEH GIS Services. This user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.

Document Path: X:\UZ\V\VERSW\157634\5-final-dsgn\51-drawings\90-GIS\Maps\Airport Distance Map.mxd

SEH
10 North Bridge Street
Chippewa Falls, WI 54729
PHONE: (715) 720-6200
FAX: (715) 720-6300
WATTS: 800-472-5881
www.sehinc.com

PROJECT: VERSW157634

DATE: 10/20/2020

ISI REQUEST
VERNON COUNTY LANDFILL
(WIDNR LICENSE NO.3268)

Distance to Viroqua Municipal Airport

Figure 1

Appendix D

USGS Maps

U.S. Geological Survey Quaternary Faults



5/6/2019 2:30:33 PM

Quaternary faults

- unspecified age, well constrained location
- unspecified age, moderately constrained location
- unspecified age, inferred location
- undifferentiated Quaternary (< 130,000 years), well constrained location
- undifferentiated Quaternary (< 130,000 years), moderately constrained location
- undifferentiated Quaternary (< 130,000 years), inferred location
- middle and late Quaternary (< 1.6 million years), well constrained location
- middle and late Quaternary (< 1.6 million years), moderately constrained location
- middle and late Quaternary (< 1.6 million years), inferred location
- latest Quaternary (<15,000 years), well constrained location

1:18,489,298

0 175 350 700 mi

0 270 540 1,080 km

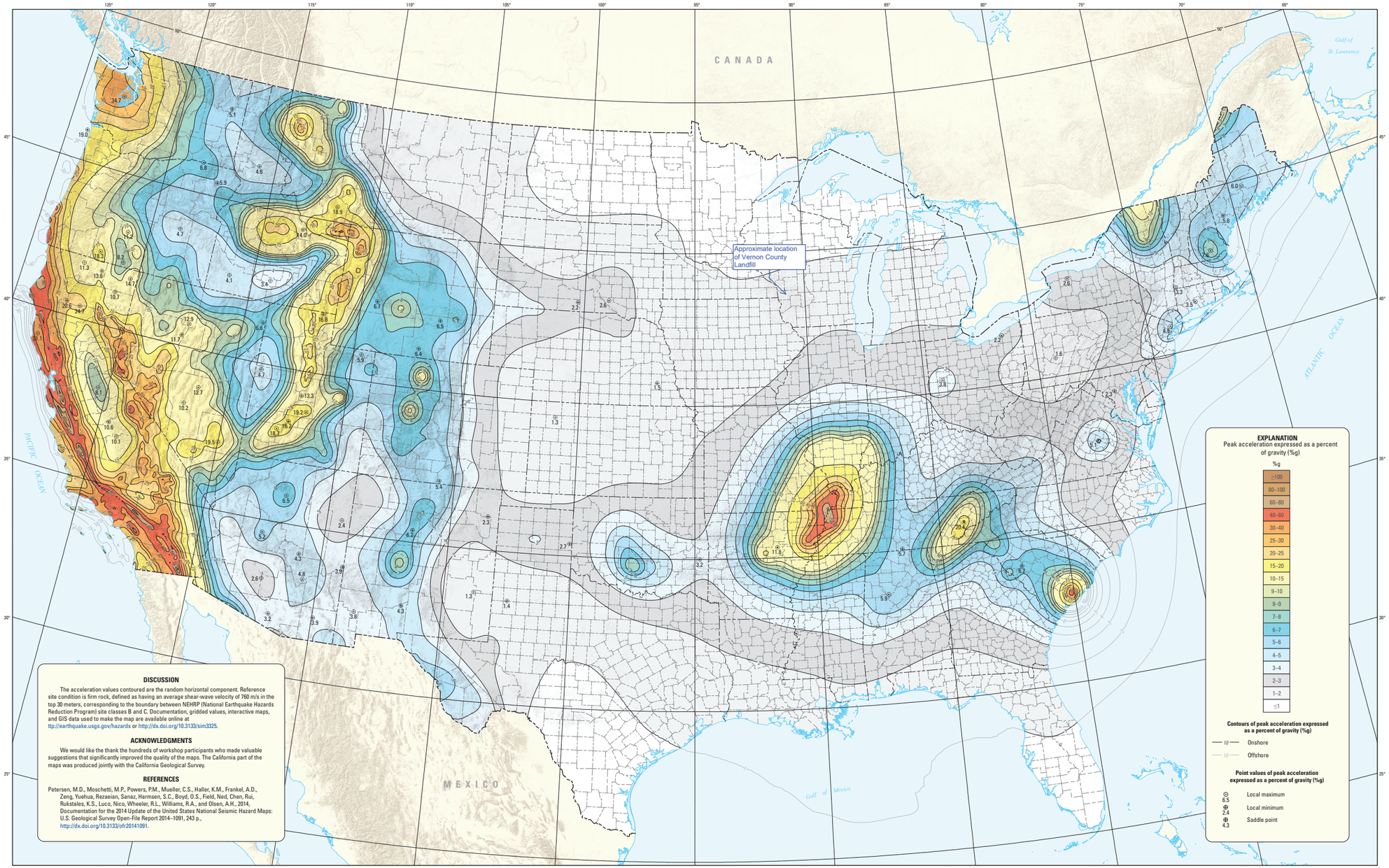
USGS, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

USGS

USGS | National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp. |

U.S. Department of the Interior
U.S. Geological Survey

Scientific Investigations Map 3325
Sheet 1 of 6



EXPLANATION
Peak acceleration expressed as a percent of gravity (%g)

%g
>100
80–100
60–80
40–60
30–40
25–30
20–25
15–20
10–15
9–10
8–9
7–8
6–7
5–6
4–5
3–4
2–3
1–2
≤1

Contours of peak acceleration expressed as a percent of gravity (%g)
10 Onshore
10 Offshore

Point values of peak acceleration expressed as a percent of gravity (%g)
6.5 Local maximum
2.4 Local minimum
4.3 Saddle point

DISCUSSION

The acceleration values contoured are the random horizontal component. Reference site condition is firm rock, defined as having an average shear-wave velocity of 760 m/s in the top 30 meters, corresponding to the boundary between NEHRP (National Earthquake Hazards Reduction Program) site classes B and C. Documentation, gridded values, interactive maps, and GIS data used to make the map are available online at http://earthquake.usgs.gov/hazards or http://dx.doi.org/10.3133/sim3325.

ACKNOWLEDGMENTS

We would like the thank the hundreds of workshop participants who made valuable suggestions that significantly improved the quality of the maps. The California part of the maps was produced jointly with the California Geological Survey.

REFERENCES

Petersen, M.D., Moschetti, M.P., Powers, P.M., Mueller, C.S., Haller, K.M., Frankel, A.D., Zeng, Yuehua, Rezaeian, Sanaz, Harmsen, S.C., Boyd, O.S., Field, Ned, Chen, Rui, Rukstales, K.S., Luco, Nico, Wheeler, R.L., Williams, R.A., and Olsen, A.H., 2014, Documentation for the 2014 Update of the United States National Seismic Hazard Maps: U.S. Geological Survey Open-File Report 2014–1091, 243 p., http://dx.doi.org/10.3133/ofr20141091.

SCALE 1:7 000 000
100 0 100 200 300 400 500 600 700 800 900 1000 MILES
100 0 100 200 300 400 500 600 700 800 900 1000 KILOMETERS

Shaded relief base from Esri Inc., 2008, Data and Maps
All other base map data from Esri Inc., 1993, Digital Chart of the World
United States County base map from the U.S. Geological Survey National Atlas, available at http://nationalatlas.gov/

Projection: Albers equal-area conic
Standard parallels 29.5°N. and 45.5°N., central meridian 95°W

Digital data prepared with ArcGIS 10.1 running under Windows 7

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Center Director, USGS Geologic Hazards Science Center
Box 25046, Mail Stop 966
Denver, CO 80225
(303) 273-8579
Or visit the Geologic Hazards Science Center Web site at:
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Seismic-Hazard Maps for the Conterminous United States, 2014

Peak Horizontal Acceleration with 10 Percent Probability of Exceedance in 50 Years

By

Mark D. Petersen,[1] Morgan P. Moschetti,[1] Peter M. Powers,[1] Charles S. Mueller,[1] Kathleen M. Haller,[1]Arthur D. Frankel,[1] Yuehua Zeng,[1] Sanaz Rezaeian,[1] Stephen C. Harmsen,[1] Oliver S. Boyd,[1] Edward H. Field,[1] Rui Chen,[2] Nicolas Luco,[1]Russell L. Wheeler,[1] Robert A. Williams,[1] Anna H. Olsen,[1] and Kenneth S. Rukstales[1]

2015

[1]U.S. Geological Survey
[2]California Geological Survey, Sacramento, Calif.

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B-2 – WDNR Vernon County ISI Response December 15, 2020

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Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
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December 15, 2020

File Ref: FID 663038310
Vernon County
SW/CORR

Ms. Stacie Sanborn
Vernon County Landfill
Route 3, Box 247 B
Viroqua, WI 54665

Subject: Initial Site Inspection Response - Proposed Expansion to Vernon County Landfill, License #3268

Dear Ms. Sanborn:

This letter documents the initial site inspection (ISI) performed by the Department of Natural Resources (department) on November 18, 2020, for the proposed expansion of the Vernon County Landfill. Waste Management Engineer Martin Herrick and Hydrogeologist Carolyn Cooper conducted the inspection. The purpose of the inspection was to identify any potential conflicts the proposed expansion might have with the location and performance standards in s. NR 504.04, Wis. Adm. Code.

As part of the inspection, the department evaluated the information in Short Elliot Hendrickson (SEH)'s November 4, 2020 ISI request letter submitted on behalf of Vernon County. The ISI request letter states that the proposed expansion is in the South ½ of Section 15, T13N, R4W. Please review this description for accuracy and provide future site location descriptions to the ¼-¼ Section level.

According to the ISI letter, the proposed expansion consists of a contiguous 10-acre horizontal expansion to the west and north of Phase 1 of the currently permitted active MSW landfill (License #3268) and a vertical expansion over the western portions of the active landfill. As observed during the ISI, the horizontal expansion area consists of open, grassy areas adjacent to the existing active landfill with wooded areas farther to the north and northeast. The area of the proposed horizontal expansion includes the current leachate loadout area, access roads to the active landfill and the closed construction and demolition waste (C&D) landfill, a wooden shed, and a soil stockpile area. Any impacts or changes to these existing features would be described in the Initial Site Report (ISR) and feasibility report.

Based on the review of the documents included with the November 4, 2020 ISI request and observations from the site inspection, the department's preliminary opinion regarding the suitability of site location is that the site location has potential. The only conflict with the locational criteria contained in s. NR 504.04 (3), Wis. Adm. Code, that was identified is a water supply well located within 1,200 feet of the proposed expansion boundary or the currently approved waste limits. Regarding the performance standards contained in s. NR 504.04 (4), Wis. Adm. Code, the department's review of the Surface Water Data Viewer (SWDV) shows a location within the proposed project area that has wetland indicators that would need to be checked by an assured wetland delineator. If there are conflicts that cannot be satisfactorily addressed in accordance with applicable requirements, then they would be constraints to site development.

Summary of Locational Criteria: As described in s. NR 504.04(3)(a) to (i), Wis. Adm. Code, there are several locational criteria that apply to the proposed landfill expansion. The proposed limits of filling may not be located within:

(a) *1,000 feet of any navigable lake, pond or flowage.* The ISI request states that there is not a navigable lake, pond, or flowage within 1,000 feet of the proposed expansion; however, there is an existing manmade stormwater detention pond within 1,000 feet of the proposed expansion, southeast of the active landfill. As a sedimentation control structure, this pond would be excluded from this setback requirement.

(b) *300 feet of any navigable river or stream*. According to the ISI request, the proposed expansion is not within 300 feet of a navigable river or stream. The department's SWDV also indicates the proposed expansion is not within 300 feet of a navigable river or stream.

(c) *A floodplain*. According to the ISI request, the proposed expansion is not within a floodplain. The department's SWDV also indicates this area is not in a floodplain.

(d) *1,000 feet of the nearest edge of the right-of-way of any state trunk highway, interstate or federal aid primary highway or the boundary of any public park or state natural area, unless the landfill is screened.* According to the ISI request there are no state trunk highways, interstate or federal aid primary highways within 1,000 feet of the proposed site. US Highway 14/61 and State Highway 27 are the closest features and will be over 12,500 feet from the proposed site. The ISI request states that there are no public parks or state natural areas within 1,000 feet of the limits of the current landfill or expansion footprint.

(e) *An area where the design or operation of the landfill would pose a significant bird hazard to aircraft.* According to the ISI request, there are no airport runways within 10,000 feet of the proposed landfill expansion. The closest runway at the Viroqua Airport is located approximately 15,800 feet (2.7 miles) southwest of the proposed landfill expansion, and the landfill is not located in the approach or departure path for the airport. Because the proposed expansion is within 5 miles of this runway, notification to the Federal Aviation Administration (FAA) is required. The ISI request included a copy of the October 23, 2020 notification made by SEH to the FAA on behalf of Vernon County. Section NR 509.06 (3), Wis. Adm. Code requires inclusion of the initial response letter from the FAA in the ISR.

(f) *1,200 feet of any public or private water supply well*. The ISI request states that no public or private wells are located within 1,200 feet of the proposed expansion boundary, except for the well serving the landfill office and recycling facility (WUWN FU046). The ISI request states that a ch. NR 812, Wis. Adm. Code variance for the setback requirement for this well was granted prior to constructing the initial landfill cell. If Vernon County pursues expansion of the landfill within the 1,200-foot setback zone, please request and justify an exemption to this locational criterion or provide an alternative water supply for this property. If the proposed limits of waste would extend closer to the well than currently approved or be located in a different gradient position with respect to groundwater flow from the water supply well, then a new NR 812 well variance application may be required. Further discussion regarding public and private wells in the area would be addressed in the feasibility report.

(g) *200 feet of a fault that has had displacement in Holocene time*. The ISI request states that the proposed expansion is not within 200 feet of a fault that has had displacement since Holocene time. Further discussion regarding the geologic stability of the area would be addressed in the feasibility report.

(h) *Seismic impact zone*. The ISI request concludes that the site is in an area of very low seismic hazard based on United States Geological Survey (USGS) information.

(i) *Unstable areas*. The ISI request states there is no evidence of unstable conditions at the site based on known current or historical data. Further discussion regarding the geologic stability of the area would be addressed in the feasibility report.

It appears that the site meets or could be constructed and operated to meet the performance standards in s. NR 504.04 (4), Wis. Adm. Code.

(a) Wetland Areas - Based on information provided in the ISI request, review of the SWDV and the site inspection, no regulated wetlands were identified within the proposed project area at this time. However, the SWDV identified a location within the proposed expansion area as a potential wetland indicator based on soil type and/or wet area. Please see the attached map. Vernon County should have this area checked by an assured wetland delineator and provide the findings in the ISR.

(b) Critical Habitat Areas - Based on a review of the Natural Heritage Inventory (NHI), no element occurrences were identified as existing in the area. Therefore, it appears unlikely that there would be any significant adverse impact on critical habitat areas or endangered or threatened species due to the proposed expansion. As the proposed project progresses through the siting process, additional reviews by department staff may be done at different stages to update the NHI review.

Archaeological issues and historical structures for the proposed expansion area were cleared by Richard Kubicek, Departmental Archaeologist/Departmental Historic Preservation Officer, on November 10, 2020.

The performance criteria outlined in s. NR 504.04 (4) (c) through (f), Wis. Adm. Code include evaluation of surface water, groundwater, gas migration and air contaminant impacts. These performance criteria would be evaluated during the department's review of a feasibility report for the proposed expansion.

Please note that s. NR 504.04 (4) (d), Wis. Adm. Code, requires submittal of a 7.5 Minute USGS map or equivalent with a scale of 1 inch=500 feet. The ISI request included a 1 inch=2000 feet scale topographic map; however, a 1 inch=500 feet scale map will be required in the ISR submittal. Several maps at this scale may be needed to show all of the items listed in this code section, which include the depiction of contour intervals to sufficiently show relief, surface waters, floodplains, existing land use conditions including the location of public parks, and all water supply wells and residences located within one mile of the property boundaries of the proposed landfill.

Please remember that s. NR 504.09 (2) (f), Wis. Adm. Code, requires a minimum separation distance of 100 feet be maintained between the limits of filling and the adjacent property line. A minimum distance of 50 feet must be maintained between any permanent berms or excavations associated with the landfill, excluding stormwater diversion structures, and the adjacent property line.

The locational and performance criteria will be evaluated again as the department reviews the ISR and feasibility report. Please keep in mind that as the department continues its review of the proposed expansion and as new information is presented, additional questions or concerns may arise, or requests for further information may be made before a feasibility determination is made.

Please do not hesitate to contact me at 608-275-7779 or by email at carolyn.cooper@wisconsin.gov if you have any questions about this letter.

Sincerely,



Carolyn Cooper, P.G.
Hydrogeologist
South Central Region

cc: Martin Herrick - DNR - WCR
John Morris - DNR - WCR
Cynthia Moore - DNR - SCR
Joe Lourigan - DNR - Madison, WA/5
Valerie Joosten - DNR - WA
Brian Kent - SEH
Darryl Heaps - SEH

B-3 – WDNR Vernon County Supplemental ISI Response November 1, 2021

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg WI 53711-5397

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
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November 1, 2021

File Ref: FID 663038310
Vernon County
SW/CORR

Ms. Stacie Sanborn
Vernon County Solid Waste and Recycling Center
S3705 County Hwy LF
Viroqua, WI 54665

Subject: Supplemental Initial Site Inspection Opinion Letter - Proposed Expansion to Vernon County Landfill, License #3268

Dear Ms. Sanborn:

This letter documents a second initial site inspection (ISI) performed by the Department of Natural Resources (department) on September 30, 2021, for additional areas of the proposed expansion of the Vernon County Landfill. Waste Management Engineer Martin Herrick and Hydrogeologist Carolyn Cooper conducted the inspection. The purpose of the inspection was to identify any potential conflicts the additional areas of the proposed expansion might have with the location and performance standards in s. NR 504.04, Wis. Adm. Code. This letter supplements the department's December 15, 2020 ISI opinion letter for the proposed expansion. All comments and recommendations contained in the previous response letter remain valid.

As part of the inspection, the department evaluated the information in SEH's September 3, 2021 revised ISI request submitted on behalf of Vernon County. The revised ISI request proposes an area to the north and east of the existing landfill for a potential landfill expansion, in addition to the areas to the north and west of the landfill that were considered in the original ISI. The revised request notes that soil borings advanced in May 2021 encountered shallow bedrock to the west of the active landfill cell. This finding, along with topographic and property boundary limitations to the west and northwest of the landfill, prompted Vernon County to consider the area north and east of the existing landfill for possible landfill development. The revised ISI states that the proposed expansion is in the South ½ of Section 15, T13N, R4W. Please review this description for accuracy and provide future site location descriptions to the ¼-¼ Section level.

According to the ISI request, the proposed expansion would consist of a contiguous 10-acre horizontal expansion to the west, north or east (or a combination thereof) of the currently permitted active MSW landfill (License #3268) and a vertical expansion over a portion of the active landfill. As observed during the inspection, the horizontal expansion area consists of open, grassy areas adjacent to the existing active landfill with wooded areas farther to the north, northeast and east. The landfill's sedimentation basin is located within the proposed expansion area east of the landfill. Features within the proposed expansion area north and west of the landfill include the leachate loadout area, access roads to the active landfill and the closed construction and demolition (C&D) landfill, a wooden shed, and a soil stockpile area. Any impacts or changes to the existing features would be described in the Initial Site Report (ISR) and feasibility report.

Based on the review of the documents included with the September 3, 2021 ISI request and observations from the site inspection, the department's preliminary opinion regarding the suitability of site location is that the site location has potential. The only conflict with the locational criteria contained in s. NR 504.04(3), Wis. Adm. Code, that was identified is a water supply well located within 1,200 feet of the proposed expansion boundary or the currently approved waste limits.

Regarding the performance standards contained in s. NR 504.04(4), Wis. Adm. Code, the department's review of the Surface Water Data Viewer (SWDV) shows a location within the proposed project area west of the existing landfill with wetland indicators that should be checked by an assured wetland delineator. If there are conflicts that cannot be satisfactorily addressed in accordance with applicable requirements, then they would be constraints to site development.

Summary of Locational Criteria: As described in s. NR 504.04(3)(a) to (i), Wis. Adm. Code, there are several locational criteria that apply to the proposed landfill expansion. The proposed limits of filling may not be located within:

(a) *1,000 feet of any navigable lake, pond or flowage.* The ISI request states that there is not a navigable lake, pond, or flowage within 1,000 feet of the proposed expansion; however, the landfill's existing sedimentation basin, a manmade stormwater detention pond east of the landfill, is located within 1,000 feet of the proposed expansion. As a sediment control feature, this pond would be excluded from the setback requirement. The pond may need to be moved and/or enlarged to accommodate a proposed expansion of the landfill. Details of the stormwater management system would be provided in the feasibility report.

(b) *300 feet of any navigable river or stream*. According to the ISI request, the proposed expansion is not within 300 feet of a navigable river or stream. The department's SWDV map also indicates the proposed expansion is not within 300 feet of a navigable river or stream.

(c) *A floodplain*. According to the ISI request, the proposed expansion is not within a floodplain. The department's SWDV map also indicates this area is not in a floodplain.

(d) *1,000 feet of the nearest edge of the right-of-way of any state trunk highway, interstate or federal aid primary highway or the boundary of any public park or state natural area, unless the landfill is screened.* According to the ISI request, there are no state trunk highways, interstate or federal aid primary highways within 1,000 feet of the proposed site. US Highway 14/61 and State Highway 27 are the closest features and would be over 12,500 feet from the proposed site. The ISI request states that there are no public parks or state natural areas within 1,000 feet of the limits of the current landfill or expansion footprint.

(e) *An area where the design or operation of the landfill would pose a significant bird hazard to aircraft.* According to the ISI request, there are no airport runways within 10,000 feet of the proposed landfill expansion. The closest runway at the Viroqua Airport is located approximately 15,840 feet (2.7 miles) southwest of the proposed landfill expansion, and the landfill is not located in the approach or departure path for the airport. Because the proposed expansion is within 5 miles of this runway, notification to the Federal Aviation Administration (FAA) is required. The revised ISI request included a copy of the October 23, 2020 notification made by SEH to the FAA on behalf of Vernon County and the FAA's March 19, 2021 response indicating that the FAA did not object to the proposed expansion. SEH contacted the FAA again on August 31, 2021 to confirm that the agency does not object to the revised expansion proposal. As of the date of this letter, a response from the FAA has not been received. Section NR 509.06(3), Wis. Adm. Code, requires inclusion of the response letters from the FAA in the ISR.

(f) *1,200 feet of any public or private water supply well*. The ISI request states that no public or private wells are located within 1,200 feet of the proposed expansion boundary, except for the well serving the landfill office and recycling facility (Wisconsin Unique Well Number [WUWN] FU046). The ISI request states that a variance for the setback requirement for this well was granted prior to constructing the initial landfill cell. If Vernon County pursues expansion of the landfill within the 1,200-foot setback zone, please request and justify an exemption to this locational criterion or provide an alternative water supply

for this property. If the proposed limits of waste would extend closer to the well than currently approved or be located in a different gradient position with respect to groundwater flow from the water supply well, then a new NR 812 well variance application may be required.

The Chad B. Williams well, located at E8263 North Asbury Road, is sampled semiannually as part of the landfill's environmental monitoring program. Please confirm the WUWN for this well and note whether the well is located within 1,200 feet of the proposed expansion boundary. An NR 812 well variance application may be required. Further discussion regarding public and private wells in the area would be addressed in the feasibility report.

(g) *200 feet of a fault that has had displacement in Holocene time*. The ISI request states that the proposed expansion is not within 200 feet of a fault that has had displacement since Holocene time. Further discussion regarding the geologic stability of the area would be addressed in the feasibility report.

(h) *Seismic impact zone*. The ISI request concludes that the site is in an area of very low seismic hazard based on United States Geological Survey (USGS) information.

(i) *Unstable areas*. The ISI request states there is no evidence of unstable conditions at the site based on known current or historical data. Further discussion regarding the geologic stability of the area would be addressed in the feasibility report.

It appears that the site meets or could be constructed and operated to meet the performance standards in s. NR 504.04(4), Wis. Adm. Code.

(a) Wetland Areas - Based on information provided in the ISI request, review of the SWDV and the site inspection, no regulated wetlands were identified within the proposed project area at this time. However, as noted in the department's previous ISI opinion letter, the SWDV identified a location within the proposed expansion area west of the landfill as a potential wetland indicator based on soil type and/or wet area. Vernon County should have this area checked by an assured wetland delineator during the growing season and provide the findings in the ISR.

(b) Critical Habitat Areas - Based on a review of the Natural Heritage Inventory, no element occurrences were identified as existing in the area. Therefore, it appears unlikely that there would be any significant adverse impact on critical habitat areas or endangered or threatened species due to the proposed expansion. As the proposed project progresses through the siting process, additional reviews by department staff may be done at different stages to update the NHI review.

Archaeological issues and historical structures for the proposed expansion area were cleared by Richard Kubicek, Departmental Archaeologist/Departmental Historic Preservation Officer, on November 10, 2020. An August 31, 2021 letter from Laura Spears, Wastewater Specialist – Stormwater, provided in revised ISI request, documents that another review for archaeological sites was performed for the S ½ of Section 15, Township 13 North, Range 4 West in the Town of Viroqua, which did not show archaeological sites. Additional reviews may be done at the ISR and feasibility report stages as the landfill footprint and locations of other supporting structures become known.

The performance criteria outlined in s. NR 504.04 (4) (c) through (f), Wis. Adm. Code, include evaluation of surface water, groundwater, gas migration and air contaminant impacts. These performance criteria would be evaluated during the department's review of a feasibility report for the proposed expansion.

Please remember that s. NR 504.06(2)(c), Wis. Adm. Code, requires the separation from the top of the bedrock surface and the bottom of the clay liner to be at least 10 feet.

Section NR 504.04(4)(d), Wis. Adm. Code, requires submittal of a 7.5 Minute USGS map or equivalent with a scale of 1 inch=500 feet. The ISI request included topographic map with a scale of a 1 inch=750 feet; however, a 1 inch=500 feet scale map will be required in the ISR submittal. Several maps at this scale may be needed to show all of the items listed in this code section, which include the depiction of contour intervals to sufficiently show relief, surface waters, floodplains, existing land use conditions, public parks, and all water supply wells and residences located within one mile of the property boundaries of the proposed landfill.

Section NR 504.09(2)(f), Wis. Adm. Code, requires a minimum separation distance of 100 feet be maintained between the limits of filling and the adjacent property line. A minimum distance of 50 feet must be maintained between any permanent berms or excavations associated with the landfill, excluding stormwater diversion structures, and the adjacent property line.

The locational and performance criteria will be evaluated again as the department reviews the ISR and feasibility report. Please keep in mind that as the department continues its review of the proposed expansion and as new information is presented, additional questions or concerns may arise, or requests for further information may be made before a feasibility determination is made.

Please do not hesitate to contact me at 608-931-9387 or carolyn.cooper@wisconsin.gov if you have any questions about this letter.

Sincerely,



Carolyn Cooper, P.G.
Hydrogeologist
South Central Region

cc: Brian Kent, SEH
Darryl Heaps, SEH
Martin Herrick, DNR-WA
John Morris, DNR-WA
Natasha Gwidt, DNR-WA
Joe Lourigan, DNR-WA
Valerie Joosten, DNR-WA

B-4 – Vernon County ISR November 17, 2021

Initial Site Report

Proposed Vertical and Horizontal Expansion

Vernon County Landfill

Viroqua, Wisconsin

WDNR License No. 3268

VERSW 157634 | November 17, 2021

SEH

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November 17, 2021

RE: Vernon County Landfill
Initial Site Report
Viroqua, Wisconsin
WDNR License No. 3268
SEH No. VERSW 157634 4.00

Ms. Carolyn Cooper, Hydrogeologist
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711-5367

Dear Ms. Cooper:

Short Elliott Hendrickson Inc. (SEH®), on behalf of the Vernon Solid Waste Department, is submitting this Initial Site Report (ISR) to obtain the Wisconsin Department of Natural Resource's opinion regarding the suitability of the proposed expansion, prior to exhausting additional resources relating to the feasibility study and report. This ISR includes a report narrative supplemented by figures and appendices.

This report was prepared in accordance with s. NR 509 Wisconsin Administrative Code. We believe the ISR is complete and request your timely review. Should you have any questions or would like to discuss the proposed expansion further, please contact me at 608.498.4844.

Sincerely,

Brian L. Kent, CHMM
Project Manager

dmk
x:\uz\v\versw\157634\3-env-stdy-regs\isi_isr\isr\final submittal\final_vernon co isr.docx

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Initial Site Report

Vernon County Landfill
Viroqua, Wisconsin

Prepared for:
Vernon County Solid Waste Department
S3705 County Road LF
Viroqua, WI 54665

Prepared by:
Short Elliott Hendrickson Inc.
329 Jay Street, Suite 301
La Crosse, WI 54601-4034
608.782.3161

I, Darryl R. Heaps, hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.



E-25799	November 17, 2021	
Darryl R. Heaps, PE, CHMM	PE Number	Date
Professional Engineer		

I, Melanie G. Niday, hereby certify that I am a licensed professional geologist in the State of Wisconsin in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code; that the preparation of this document has not involved any unprofessional conduct as detailed in ch. GHSS 5, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.



672-013	November 17, 2021	
Melanie G. Niday, PG	PG Number	Date
Scientist		

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1	Joe Lourigan Hydrogeologist Wisconsin Department of Natural Resources PO Box 7921 Madison, WI 53707-7921
1	Valerie Joosten, PE Waste Management Engineer Wisconsin Department of Natural Resources 2984 Shawano Ave Green Bay, WI 54313-6727
1	Stacie Sanborn, Director of Solid Waste Vernon County Solid Waste Department S3705 County Road LF Viroqua, WI 54665
1	WDNR - Bureau of Waste Management 101 S. Webster Street PO Box 7921 Madison, WI 53707
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Executive Summary

The Vernon County Landfill is proposing to expand the active municipal solid waste (MSW) landfill (License #3268) to accommodate waste disposal needs for the existing waste service area beyond the current permitted capacity. Based on conservative projections, the proposed expansion would add approximately 430,000 cubic yards to the current permitted capacity and have site life of approximately 15 years. The expansion would include an approximate 10-acre contiguous horizontal and vertical expansion east of the existing active landfill. The horizontal component consists of an approximate 4.0-acre horizontal expansion due east and contiguous with Phase III. The vertical expansion will extend the existing landfill vertically over an approximate 5.0-acre area of the existing footprint. The proposed expansion will overlay its waste onto Phase III.

The proposed expansion meets the locational criteria of s. NR 504.04(3) Wis. Admin. Code with the exception of a water supply well located within 1,200 feet of the proposed expansion boundary and the currently approved waste limits. The water supply well currently serving the landfill office and recycling facility is located within the 1,200-foot setback requirement, however a NR 812, Wis. Adm. Code variance for the setback requirement for this well was granted prior to constructing the initial landfill cell in 1992. Assuming the County proceeds with expansion and preparation of a feasibility study report, a request for exemption to the requirements of s. NR504.04(3)(f) will be included to allow the construction of a landfill within 1,200-ft of the well.

The current landfill, and proposed expansion, are located in portions of the SE¼ of the SW¼, and the SW¼ of the SE¼ of Section 15, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin. The land use surrounding, and adjacent to the landfill property consists of a mix of agricultural and wooded parcels. The closest residence is located to the south on County Road LF and is approximately 1,500-feet from the landfill. The proposed expansion, plus the existing active MSW landfill will occupy approximately 15 acres of the approximate 250 acres owned by Vernon County.

The geologic setting where the existing landfill, and proposed expansion, are located is in an unglaciated portion of Wisconsin known as the “Driftless” region. Topography within this area is typified by systems of bedrock ridges cut by stream and river valleys. A system of bluffs forms the higher elevations generally through the central portion of the site. The proposed horizontal expansion area is along the top of this bluff system. The subsurface geology consists of silty loess as well as clay soils generated from weathering of dolomite bedrock (ridges) along with alluvium and lake deposits in the river and stream valleys. Unconsolidated deposits are of varying thickness depending on location. Ordovician aged dolomites of the Prairie du Chien group underlies the unconsolidated deposits and Cambrian age sandstone underlies the dolomite. Regional groundwater flows south towards the Kickapoo River located approximately three miles east of the site.

It is Vernon County’s opinion that the proposed expansion is in compliance with the locational criteria and will be designed in accordance with the performance standards outlined in s. NR 504.04(3) & (4) Wis. Adm. Code. Accordingly, Vernon County requests the WDNR provide an opinion of this ISR regarding the suitability of the proposed expansion, prior to exhausting additional resources relating to the feasibility study and report.

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Initial Site Report

Vernon County Landfill

Prepared for Vernon County Solid Waste Department

1 Introduction

1.1 Purpose

The Vernon County Landfill (WDNR License No. 3268) proposes to expand the existing landfill for disposal of municipal solid waste (MSW), construction & demolition (C&D) waste, commercial and industrial waste. Short Elliott Hendrickson Inc. (SEH®), on behalf of the Vernon County Solid Waste Department (County), is issuing this Initial Site Report (ISR) to provide the information required in s. NR 509.05 through s. NR 509.07 Wisconsin Administrative Code (Wis. Adm. Code). The purpose of the ISR is to obtain preliminary opinion from the WDNR on the potential the property has for expansion and the advisability of spending additional time and funds to prepare a feasibility report.

1.2 Background

The Vernon County Solid Waste Department owns and operates an integrated waste management system on approximately 250-acres located in the Town of Viroqua, Wisconsin. The integrated waste management system includes:

- An approximate 10-acre municipal solid waste landfill, with an approximate design capacity of 590,000 cubic yards (WDNR License No. 3268)
- A closed small sized (50,000 cubic yard) C&D Landfill (WDNR License No. 3712)
- A recyclable material processing and baling facility

1.3 General Submittal Requirements (NR 500.05)

1.3.1 Review Fee

It is our understanding that the WDNR will issue an invoice to the Vernon County Solid Waste Department for $3,300 to cover the WDNR plan review fees for the ISR. The County will issue payment of the invoice within 30 days of receipt of the invoice, unless special circumstances are warranted and approved by the WDNR.

1.3.2 Paper and Electronic Copies

The County will provide the WDNR copies, electronic and hard copy, of this ISR and future reports and applicable addendums according to the schedule below.

Electronic (Plans and Reports)	Hard Copy (Plan Sheets)	Hard Copy (Report)
Carolyn Cooper	Carolyn Cooper	Carolyn Cooper
Joe Lourigan	Joe Lourigan	(2) Marty Herrick, PE
Marty Herrick, PE	Marty Herrick, PE	WDNR Madison Office
Valerie Joosten, PE	Valerie Joosten, PE	
WDNR Madison Office (USB flash drive)	WDNR Madison Office	

Electronic copies may be transmitted via electronic mail, a secure web-based file/data sharing portal, or flash drive provided with hard copy submittals.

1.3.3 Certifications

This ISR, and future feasibility study, will be prepared and directly supervised, by a State of Wisconsin licensed Professional Engineer and Professional Geologist. The following individuals are a Professional Engineer or Professional Geologist, have prepared and directly supervised preparation of this report, and have provided their signature and seal on the Certification Page of this report.

Name	Title/Certification	Role
Darryl R. Heaps, PE (WI, MN, MS)	Prof. Engineer (WI PE# E-25799)	Engineering Design/ Plans/Report
Melanie G. Niday, PG (WI, MN)	Prof. Geologist (WI PG #672-013)	Geology/Hydrogeology Interpretation

1.3.4 Other General Requirements

A cover letter detailing the desired WDNR action and response is located at the front end of this ISR. A Table of Contents is provided on pages i. and ii. listing the major sections and subsections of this ISR including figures, tables and appendices. Appendices are provided to include all raw data and references identified in the ISR. All visuals required as part of this ISR are attached and have been prepared to comply with the requirements of s. NR 500.05(6)(a-i) Wis. Adm. Code.

1.4 Initial Site Inspection

SEH, on behalf of the County, issued a report to the WDNR titled “Initial Site Inspection Request” dated November 4, 2020. The WDNR conducted a site inspection for the proposed expansion on November 18, 2020. A revised ISI request dated September 3, 2021, was submitted to the WDNR which included additional area to the north and east of the existing landfill for potential landfill expansion. The WDNR conducted a site inspection of the additional areas on September 30, 2021. Due to concerns with the COVID-19 pandemic, participants in the initial site inspection were limited to WDNR staff, and included:

- Martin Herrick, WDNR Engineer
- Carolyn Cooper, WDNR Hydrogeologist

A copy of the original ISI request and revised ISI request are included in Appendix A “ISI Request and WDNR Response.” Appendix A also includes a copy of the WDNR’s December 15, 2020

"Initial Site Inspection Response - Proposed Expansion to Vernon County Landfill, License #3268," and the WDNR's November 1, 2021 "Supplemental Initial Site Inspection Opinion Letter – Proposed Expansion to Vernon County Landfill, License #3268."

Items referenced in the WDNR's December 15, 2020, and November 1, 2021, ISI response's that are relevant to this ISR are summarized below:

- Based on the review of the documents included with the November 4, 2020, ISI Request, the September 3, 2021, revised ISI Request and observations from the site inspection, the department's preliminary opinion regarding the suitability of site location is that the site location has potential.
- The ISI request states that no public or private wells are located within 1,200 feet of the proposed expansion boundary, except for the well serving the landfill office and recycling facility (WUWN FU046). The ISI request states that a ch. NR 812, Wis. Adm. Code variance for the setback requirement for this well was granted prior to constructing the initial landfill cell. If Vernon County pursues expansion of the landfill within the 1,200-foot setback zone, please request and justify an exemption to this locational criterion or provide an alternative water supply for this property. If the proposed limits of waste would extend closer to the well than currently approved or be located in a different gradient position with respect to groundwater flow from the water supply well, then a new NR 812 well variance application may be required. Further discussion regarding public and private wells in the area would be addressed in the feasibility report.
- The Chad B. Williams well, located at E8263 North Asbury Road, is sampled semiannually as part of the landfill's environmental monitoring program. Please confirm the WUWN for this well and note whether the well is located within 1,200 feet of the proposed expansion boundary. An NR 812 well variance application may be required. Further discussion regarding public and private wells in the area would be addressed in the feasibility report.
- The ISI request states that there is not a navigable lake, pond, or flowage within 1,000 feet of the proposed expansion; however, the landfill's existing sedimentation basin, a manmade storm water detention pond east of the landfill, is located within 1,000 feet of the proposed expansion. As a sediment control feature, this pond would be excluded from the setback requirement. The pond may need to be moved and/or enlarged to accommodate a proposed expansion of the landfill. Details of the storm water management system would be provided in the feasibility report.
- Based on information provided in the ISI request, review of the SWDV and the site inspection, no regulated wetlands were identified within the proposed project area at this time. However, the SWDV identified a location within the proposed expansion area as a potential wetland indicator based on soil type and/or wet area. Please see the attached map. Vernon County should have this area checked by an assured wetland delineator and provide the findings in the ISR.
- According to the ISI request, there are no airport runways within 10,000 feet of the proposed landfill expansion. The closest runway at the Viroqua Airport is located approximately 15,840 feet (2.7 miles) southwest of the proposed landfill expansion, and the landfill is not located in the approach or departure path for the airport. Because the proposed expansion is within 5 miles of this runway, notification to the Federal Aviation Administration (FAA) is required. The ISI request included a copy of the October 23, 2020, notification made by SEH to the FAA on behalf of Vernon County, and the FAA's

March 19, 2021, response indicating that the FAA did not object to the proposed expansion. SEH contacted the FAA again on August 31, 2021, to confirm that the agency does not object to the revised expansion proposal. As of the date of this letter, a response from the FAA has not been received. Section NR 509.06(3), Wis. Adm. Code requires inclusion of the response letters from the FAA in the ISR.

- Please note that s. NR 504.04(4)(d), Wis. Adm. Code, requires submittal of a 7.5 Minute USGS map or equivalent with a scale of 1 inch=500 feet. The ISI request included a 1 inch=2000 feet scale topographic map; however, a 1 inch=500 feet scale map will be required in the ISR submittal. Several maps at this scale may be needed to show all of the items listed in this code section, which include the depiction of contour intervals to sufficiently show relief, surface waters, floodplains, existing land use conditions including the location of public parks, and all water supply wells and residences located within one mile of the property boundaries of the proposed landfill.
- It appears that the site meets or could be constructed and operated to meet the performance standards in s. NR 504.04(4), Wis. Adm. Code.
- The performance criteria outlined in s. NR 504.04(4)(c) through (f), Wis. Adm. Code include evaluation of surface water, groundwater, gas migration and air contaminant impacts. These performance criteria would be evaluated during the department's review of a feasibility report for the proposed expansion.
- Please remember that s. NR 504.06(2)(c), Wis. Adm. Code, requires the separation from the top of the bedrock surface and the bottom of the clay liner to be at least 10 feet.
- Please remember that s. NR 504.09 (2)(f), Wis. Adm. Code, requires a minimum separation distance of 100 feet be maintained between the limits of filling and the adjacent property line. A minimum distance of 50 feet must be maintained between any permanent berms or excavations associated with the landfill, excluding stormwater diversion structures, and the adjacent property line.

The items referenced above are addressed in this ISR. Following is a summary of additional understandings based on past experience and discussions with the WDNR:

- Requirements for the geotechnical investigation for the expansion are based on horizontal boundaries. The horizontal extent of the vertical expansion (on existing permitted air space) has already been investigated and documented.
- Geotechnical data collected since the previous expansion can be utilized assuming it meets the requirements of applicable regulations.
- Wisconsin solid waste regulations do not distinguish between weathered bedrock and competent bedrock and the WDNR evaluates each situation on a case-by-case basis. The WDNR has allowed less than a 10-foot separation to weathered bedrock at a few landfills in the past because the weathered bedrock had characteristics very similar to soil such as lacking good cohesion, tending to be friable, low RQDs, no auger refusal, etc. The feasibility report should discuss the differences between the weathered bedrock and competent bedrock.
- Variances and exemptions presented and approved for the alternate geotechnical program during the previous expansion (2003) are specific to that request and approval. The County will need to prepare an alternate geotechnical program request for the proposed expansion inclusive of any proposed variances or exemption requests to code requirements.

- Review of the NR 140 requirements for expansions is limited to the monitoring points installed and monitored for that monitoring license and does not need to include other monitoring points on the same property installed for a different facility and monitoring license.
- At a minimum, the WDNR requires four hard copies, and one electronic copy of all reports for the ISR and Feasibility report, and associated addendums, if necessary. An additional electronic copy of any plans or drawings associated with the report is also required. The County will provide additional electronic copies per the WDNR request as outlined in Section 1.3.2.

1.5 Potential Conflicts with Location and Performance Standards of NR 504.04

The ISI report located in Appendix A details the compliance status of the proposed expansion to the location standards of s. NR 504.04(3) and performance standards of s. NR 504.04(4)(a.-b.). The performance standards of s. NR 504.04(4)(c.-f.) are not addressed in the ISI or ISR, but will be covered in the feasibility report. Refer to Section 1.4 and Appendix A regarding the WDNR's response to the ISI Request and additional considerations relating to compliance of the location and performance standards of s. NR 504.04.

The only conflicts with the locational criteria or performance standards identified during the ISI was the presence of the facility's water supply well located within 1,200 feet of the proposed expansion boundary or the currently approved waste limits, and the potential presence of wetland indicators within the proposed expansion area based on review of the WDNR's Surface Water Data Viewer (SWDV) interactive map.

As noted in the ISI and per the WDNR's ISI response's, the private well servicing the County's office and recycling center is located less than 1,200 feet from the existing landfill footprint. On November 5, 1991 the WDNR issued the County a variance to install a potable well within 1,200-ft of the proposed landfill. The WDNR approved the plan of operation for the landfill on July 20, 1992 and the well was constructed on November 7, 1992. As part of the WDNR's feasibility determination for the last expansion (June 28, 2004) the WDNR issued an exemption to the requirements of s. NR504.04(3)(f) to allow the construction of a landfill within 1,200-ft of the potable well. Assuming the County proceeds with expansion and preparation of a feasibility study report, a request for exemption to the requirements of s. NR504.04(3)(f) will be included to allow the construction of a landfill within 1,200-ft of the well.

Additionally, in the November 1, 2021, ISI response, the WDNR requested the WUWN of the Chad B. Williams well located at E8263 North Asbury Road and to note whether the well is located within 1,200 feet of the proposed expansion boundary. Per the WDNR's Groundwater and Environmental Monitoring System (GEMS) database, the WUWN is FF457 for the Chad B. Williams well. The Williams well is located south of the existing landfill and is routinely monitored as part of the landfill's monitoring program. Figure 2 of Appendix E shows the approximate location of the Williams well, and other water supply wells in the area, relative to the existing landfill and proposed expansion. The proposed expansion is located due east of the current landfill and further from the Williams residence compared to the existing landfill. Based on the approximate location of the Williams well, the well is located greater than 1,200 feet from the proposed expansion and existing landfill. Additionally, the 1990 and 2003 feasibility studies for

the existing landfill indicate the Williams well is located greater than 1,200 feet from the existing landfill.

As suggested in the WDNR's ISI response's, the area of potential wetland indicators was inspected by an assured wetland delineator on May 4, 2021. The field visit was conducted under temperature that were normal and precipitation conditions that were drier than normal as compared to the historical average for the region according to USDA Field Office Climate Data WETS tables from the Viroqua, WI Station in Vernon County. The drier than normal conditions did not hinder the investigation for wetlands. The May 4, 2021, inspection concluded that no areas meeting the technical criteria for wetland are present within the area investigated. A copy of the memorandum documenting the wetland inspection is provided in Appendix B.

1.6 ISR Checklist

Appendix C, "ISR Checklist" includes a completed Initial Site Report Completeness Checklist. The checklist was utilized by SEH to confirm correct and sufficient data is provided to the WDNR in accordance with ch. NR 509 Wis. Adm. Code, and as a quick reference guide to the WDNR reviewer for location of applicable information contained in this report.

2 Submittal Requirements (NR 509.05(3))

2.1 General Information

The County is proposing to permit a horizontal and vertical expansion for the municipal waste landfill (WDNR License No. 3268). The proposed expansion is described as following:

- Contiguous horizontal and vertical expansion of approximately 10-acres east of the existing active landfill (License No. 3268)
- Vertical expansion with a waste overlay onto the eastern portion of the existing active landfill.

The current landfill, and proposed expansion, are located in portions of the SE¼ of the SW¼, and the SW¼ of the SE¼ of Section 15, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin. The physical address for the existing and proposed landfills and the solid waste department is S3705 County Road LF, Viroqua, Wisconsin. The proposed landfill horizontal component consists of an approximate 4.0-acre horizontal expansion due east and contiguous with Phase III. The contiguous design promotes a minimized landfill footprint. The vertical expansion will extend the existing landfill vertically over an approximate 5.0-acre area of the existing footprint. The proposed expansion will overlay its waste onto Phase III. The approximate waste footprint for the proposed expansion is shown on the attached Figure 1, "Preliminary Waste Footprint."

2.1.1 Primary Contacts

Owner and Applicant:

Vernon County
Contact: Stacie Sanborn, Solid Waste Director
S3705 County Road LF
Viroqua, WI 54665
608.634.2900
stacie.sanborn@vernoncounty.org

Landfill Operator:

Vernon County Solid Waste Department
Contact: Stacie Sanborn, Solid Waste Director
S3705 County Road LF
Viroqua, WI 54665
608.634.2900
stacie.sanborn@vernoncounty.org

Engineering Consultant:

Short Elliott Hendrickson Inc.
Contact: Brian Kent
329 Jay Street Suite 301
La Crosse, WI 54601
608.498.4844
bkent@sehinc.com

2.2 Proposed Landfill Life and Design Capacity

The proposed vertical and horizontal landfill expansion will have a design capacity of approximately 430,000 cubic yards. It is anticipated that the proposed expansion will extend the existing facility air space capacity by 15 years

2.3 System Description and Municipalities Serviced

The Vernon County Landfill serves all municipalities, commercial businesses and industry located within Vernon County, which includes 21 townships, 9 villages, and three cities. Based on US Census Bureau estimates (July 2019), the approximate population of Vernon County is 30,800. This system is utilized by municipal and private waste haulers licensed to operate within the County.

The system accepts residential, commercial, industrial, and institutional wastes. Vernon County also serves as the Recycling Responsible Unit for the municipalities located within the County. The services offered by the system are consistent with the State of Wisconsin's waste management policies. The system keeps transportation distances and costs low, as well as ensuring strong private sector competition by maintaining accessible, fairly priced services.

2.3.1 Recycling Program

Beginning in 1991, the Vernon County Solid Waste and Recycling program has served as the Responsible Unit for the municipalities located within Vernon County. The recycling program provides roll-off containers and curbside delivery and pick up to each participating municipality. The source separated recycled materials are delivered to the recycling building, located at the landfill property, where they are further processed, sorted and bailed for subsequent sale. The Vernon County recycling program was recognized with the WDNR Wisconsin Recycling Excellence Overall System Award during 2020.

2.3.2 MSW Landfill

The MSW landfill was originally designed and permitted in early 1992 with three horizontal phases, a design capacity of 315,000 cubic yards, and comprising of an approximately 9.5-acre footprint. A vertical expansion was approved in 2005, which included three additional vertical sequences and added 275,000 cubic yards of air space.

The liner system for Phases I through III consists of a 5-foot-thick clay liner overlain with a 60-mil HDPE geomembrane liner. Phases I and III are underlain with a partial basin clay lined lysimeter. To date, all the permitted landfill cells have been constructed. Approximately 7-acres of the landfill has interim cover, and no final cover has been completed.

Waste currently placed in the MSW landfill includes MSW from County residences and commercial establishments, C&D waste, and industrial/special wastes. As of March 9, 2021 approximately 93,090 cubic yards of permitted airspace remains in the MSW landfill. Based on the average fill rate from the last three years, the existing permitted MSW landfill will be full in approximately January 2025.

2.3.3 C&D Debris

C&D debris that is not diverted prior to delivery to the landfill is placed in the MSW landfill.

2.3.4 Citizens Drop-off Area

Use of the landfill's public drop-off site is available to homeowners, renters, and businesses located within Vernon County. In 2019, the citizen's drop-off area was expanded to include bins for source separated recyclables and provides a valued convenience to the system users and is much safer than allowing the general public access to the active landfill face and recyclable material processing areas with equipment operators and haulers. Drop off items include:

- Source separated recyclables (plastic, glass, tin, paper, metal)
- Tires
- Large items: Furniture and furnishings including upholstered items
- General household waste, toys, bikes, grills, lawnmowers (without gas and oil), mattresses, stoves, hot water heaters, washers, dryers, small appliances, and other items
- Demolition/Construction Debris: Wood, drywall, doors, windows, sinks, toilets, tubs, roofing, bricks, carpets, tile, and flooring
- Garbage: Normal household waste like bagged waste, paper, and food waste
- Other: Yard waste/grass clippings, shingles, brush, and animal carcasses
- Refrigerators, dehumidifiers, air conditioners

2.4 Anticipated Waste Types and Characteristics

It is anticipated that the future waste types and characteristics will remain very similar to the waste currently being received, and landfilled, at the facility. Slight changes may occur as the result of improvement to national, regional and local recycling initiatives, such as food wastes or other high organic waste streams being diverted. During 2020, approximately 20,937 tons of waste was placed in the MSW landfill. Of this tonnage, approximately 95% was MSW and 5% was C&D material.

While not a significant source of tonnage, special waste is accepted at the landfill. Prior to accepting special wastes at the facility, each waste type and generator are thoroughly reviewed in accordance with the approved Special Waste Management Plan to ensure they are appropriate for disposal and will not negatively impact landfill operations. Special waste sources that are not appropriate are rejected as part of the application process and are not received at the facility.

A copy of the 2020 Vernon County Landfill Tonnage Report is Provided in Appendix D.

2.5 Anticipated Cover Frequency

Cover frequency will be daily, as is currently applied. The majority of daily cover utilized by the facility consists of sand imported to the site. When available, alternative daily cover (ADC), which are beneficially used waste products received at the facility, are utilized for daily cover. Currently the facility is approved to utilize the following waste streams for ADC:

Foundry Sand	Wood Chips	Petroleum Impacted Soil
Street Sweepings	Foundry Slag	Coal Bottom Ash

At least 6-inches of daily cover and/or ADC is placed on the active working face at the end of each day. To the extent feasible, the daily cover and ADC is removed at the beginning of each day and reused.

2.6 Mode of Operation

The Vernon County Landfill will continue to operate as an area fill with the following considerations:

- Segregate C&D material from MSW to the extent operationally feasible
- Utilize a 10-foot “fluff” lift when placing waste on a newly constructed cell. The fluff lift consists of MSW that does not contain large items that could potentially pierce the liner
- Separate disposal areas for asbestos containing materials, which are tracked and mapped

2.7 Anticipated Subbase, Base and Final Grades

The preliminary subbase, base and final cover grades discussed below for the proposed horizontal and vertical expansion of the Vernon County Landfill have been generated following the design requirements of s. NR 504 Wis. Adm. Code. The horizontal expansion area will consist of a composite liner system with the base graded in a herringbone configuration to convey leachate to the center collection trench and low sump area located on the south side of the expansion. Details of the subbase, base liner and final grades will be presented with the feasibility report.

2.7.1 Subbase Grades

The subbase grades presented are conceptual and are based on available information from historical reports, investigations, and bedrock excavation activities in the vicinity of the proposed expansion area. Modification of subbase elevations may be necessary following completion of the geotechnical investigation conducted for the feasibility study.

Subbase grades for the horizontal expansion will be positioned at least 10-feet above the seasonal high groundwater elevation. It is anticipated that bedrock excavation may be necessary to achieve a 10-foot separation between the bottom of the liner and top of bedrock. The attached Figure 2, “Preliminary Subbase Grades” provides the preliminary subbase elevation for proposed horizontal expansion.

2.7.2 Base Grades

The proposed base grades for the horizontal expansion mirror the subbase elevations, and are presented on Figure 3, “Preliminary Base Grades,” with an additional 5 feet of clay for the compacted liner system.

The base elevations for the vertical expansion are immediately above the top of final permitted waste grades of waste within the expansion footprint.

2.7.3 Final Grades

The preliminary final grades for the proposed expansion, and existing landfill area are shown on Figure 4,” Preliminary Final Closure Grades.” The final grades include a total final cover thickness of 6.5-feet over the waste with a 12-inch sand grading layer. In accordance with s. NR 504.07 the final cover will consist of, starting from the grading layer, 2-feet of compacted clay, a 40-mil geomembrane, a 1-foot drainage layer, 2-feet of rooting zone soil layer, and 6-inches of topsoil.

3 Land Use Information

3.1 Present Land Use

The approximate 4.0-acres for the proposed horizontal expansion are currently vegetated grassland, wooded, and undeveloped, except for the current sedimentation basin along the east side of the existing landfill. The land immediately to the east and north of the landfill and proposed expansion area is owned by Vernon County. It consists of a wooded ridge sloping rapidly to separate valleys, which converge approximately 5,000-feet to the northeast in the area of Seas Branch Pond. Beyond the wooded valley to the east are agriculture fields with a farm located approximately 1-mile east and a farm approximately 4,000-feet southeast.

Adjacent property to the north is wooded and decreases in elevation to the Seas Branch Stream, located approximately 1,500-feet from the landfill, which meanders along County Highway Y. Intermittent residential properties are located along County Highway Y, with the closest being approximately 1,900-feet from the landfill. Land use for property to the west of the landfill is a mixture of agriculture fields and wooded parcels. The closest residence to the west is located on County Road Y and is approximately 2,700-feet from the landfill. Land use for the property to the south of the landfill is also a mixture of agriculture fields and wooded parcels. The closest residence to the south is located on County Road LF and is approximately 1,500-feet from the landfill.

The following is a summary of the figures in Appendix E that present land use information. Please note the figures and table in Appendix E were also provided with the ISI request, and contain additional information including topography, surface waters, flood plains, and existing land use within 1-mile of the landfill property boundary.

- Figure 1 - Site Location: Provides a USGS 7.5-minute quadrangle map depicting location, topography/relief, and surface waters other than man-made storm water basins on the landfill property.
- Figure 2 - Residential and Private Wells Within 1-Mile of Horizontal Expansion: Includes an aerial photograph depicting residences, private wells and landowners within 1-mile of the landfill property. The attached Table 1 of Appendix E, “Adjacent Property Owners” provides a listing of each of the landowners and/or residences located within 1,200 feet of the landfill footprint or contiguous to the landfill property.
- Figure 3 - Floodplains and Water Features Within 1-Mile of Horizontal Expansion: Identifies flood hazard areas and surface water bodies within 1-mile of the landfill property.
- Figure 4 - Topography Within 1-Mile of Horizontal Expansion: Provides topography within 1-mile of the landfill property. The topography data was provided by the Vernon County Land Information Department and is more current than the USGS map provided on Figure 1. Figure 4 provides tighter contour intervals, compared to the USGS map (2 ft. spacing versus 20 ft.), to better portray topographic relief within 1 mile of the expansion area. Figure’s 2 through 5 were provided to the WDNR on 34” x 52” plan sheets for the ISI submittal at a scale of 1 inch = 500 feet. Figure’s 1 through 5 of Appendix E are being provided to depict the information required by NR 504.04(4)(d).
- Figure 5 - Existing Land Use Within 1-Mile of Horizontal Expansion: Identifies the current land use and category for areas within 1-mile of the landfill property.

3.2 Existing Land Uses Which May Have an Impact on Suitability

There are no existing land uses within one mile of the landfill that will have a negative impact on the suitability of the proposed expansion. The closest residence to the existing landfill is located approximately 1,500-feet to the south and is shielded from the operations view due to topography and wooded parcels. Agricultural activities in the area have not historically impacted site operations, or vice versa. Very little residential development has occurred near the landfill since the landfill was initially permitted.

3.3 Impacts of Expansion on Groundwater Quality

Groundwater quality impacts associated with the historic solid waste disposal operations have not been identified at the site. Due to the design requirements for the existing and proposed landfill expansion, including an engineered liner/cover and leachate collection, the proposed expansion should not adversely impact groundwater quality.

3.4 Areas Where Land Uses Would Be Affected by Proposed Landfill Expansions

There are not areas where land uses would be affected by the proposed landfill expansion. The proposed expansion is located entirely on existing property owned by Vernon County. The land use on properties adjacent to the landfill property are not anticipated to change.

3.5 Adjacent Landowners

Landowners whose property is contiguous to the landfill property boundaries and all residences located within 1,200 feet of the anticipated limits of filling are provided in Appendix E, Figure 2. Names and contact information for the landowners are summarized on Table 1 located in Appendix E. The proposed landfill expansion footprint is located on property currently owned by Vernon County and the footprint is greater than 100-feet from any existing property boundary. In addition, there are no existing residences or private wells located within 1,200 feet of the proposed landfill expansion footprint. The private well servicing the County's office and recycling center is located less than 1,200 feet from the existing landfill footprint. On November 5, 1991, the WDNR issued the County a variance to install a potable well within 1,200-ft of the proposed landfill as discussed in Section 1.5.

Properties contiguous to the County landfill property consist primarily of large vacant parcels of property owned by local residents. Following is a summary of the properties contiguous to the landfill property and a cross reference number showing their location on Figure 2 and Table 1 in Appendix E:

- Randy and Karen Crume own two parcels to the north and east of the County property. One parcel (#1) is approximately 20-acres and is wooded and undeveloped. The second contiguous parcel (#2) is approximately 38-acres is being utilized for pasture, agricultural fields and agriculture buildings The Seas Branch Stream also meanders through the parcel.
- Alvin Woodmansee owns an approximate 3-acre parcel (#3) to the east of parcel #1 and north of the County property. The parcel is wooded and undeveloped.
- Pauline Buckland owns an approximate 30-acre parcel (#4) of wooded undeveloped land east and north of the County property.
- K&M Herlitzke Farms LLC owns five parcels (#5, #6, #7, #12, and #13) to the east, southeast and south of the County property. The parcels comprise approximately 140-acres and are utilized for agriculture fields.
- Madeline Clements owns an approximate 20-acre parcel (#8) east of the County property. The property is wooded, and a small house or cabin is located in the south-central portion of the property.
- Wisconsin RSA #8 owns an approximate 9-acre parcel (#9) east of the County property. The parcel contains a telecommunication tower and a small building within a fenced and secured area. The building likely contains equipment associated with the telecommunications tower.
- The Zion Church owns an approximate 1-acre parcel (#10) to the southeast of the County property. The one-acre parcel is vacant except for a small rural cemetery.
- The John & Linda Kieler Revocable Trust owns three parcels (#14, #16, #18) south of the County property across County Road LF. The parcels comprise approximately 90-acres wooded and are utilized for agriculture fields.
- Robert & Tammy Menne own an approximate 4-acre parcel (#15) south of the landfill property across County Road LF. The property is utilized as a residence and for agriculture related activities.
- Chad Williams owns an approximate 4-acre parcel (#17) south of the landfill property. The property is utilized as a residence. The William's private well is routinely sampled as part of the existing WDNR plan of operation approval.

- Wayne Kruizenga owns an approximate 28-acre parcel (#19) west of the landfill property. The property is vacant is utilized as an agriculture field.
- Alice Mae Nelson owns two contiguous parcels (#20 & #21) west and northwest of the landfill property. The parcels comprise approximately 80-acres and are a mixture of wooded areas, agriculture fields and pasture. County Road Y and the Seas Branch Stream meander through the northernmost parcel (#21).
- Grace Acres LLC own two contiguous properties (#22 & #23) north and northwest of the landfill property. The parcels comprise approximately 28-acres and contain a mixture of wooded areas, agriculture fields and pasture. The Seas Branch Stream meanders through the parcel #22 and a residence and outbuildings are located on the north side of the Seas Branch Stream.

3.6 Land Use Zoning

The Vernon County Landfill property is located within the Town of Viroqua jurisdictional boundary. According to the Town of Viroqua Clerk, the township has adopted a zoning ordinance which is available on their website. Pursuant to Wisconsin Statute s. 289.22 (Local Approval), the Vernon County Solid Waste Department will be issuing a certified letter to the Town of Viroqua requesting they specify all applicable local approvals that are required.

Based on review of the draft ordinance and zoning map, the Vernon County Landfill property is located in a “Special Purpose District”. Permitted uses in the special purpose district include the following uses, so long as such sites are secured in a sufficient manner to insure public and environmental safety, including meeting all applicable State or Federal standards and laws: Landfills and former Landfills; Junk Yards; and, chemical, biological, and/or hazardous material production or handling.

Based on review of the Town of Viroqua’s zoning ordinance, current zoning will not require special applications or variances to facilitate the landfill expansion. Since the entire proposed expansion footprint is located on Vernon County property, and does not require a purchase of agricultural property, an Agricultural Impact Statement will not be required.

As indicated in the WDNR’s opinion to the initial site inspection, the proposed expansion is not located in a floodplain, conservancy or shore land. In such, zoning ordinances relating to these instances are not applicable.

3.7 Recreational, Historical, Archaeological and Critical Habitats

3.7.1 Recreational Areas

There are no recreational areas on and in the vicinity of the landfill property.

3.7.2 Historical and Archeological Sites

As required by Wis. Stat. §44.40, the WDNR performed a review of the area to determine if any known historic, scientific, or archeological areas exists at or near the proposed facility. On October 2, 2020, Laura Spears, WDNR Wastewater Specialist, issued a letter summarizing the findings of an endangered resources (ER) and cultural/historic review for the proposed expansion as part of the ISI request. The ER and cultural/historic review were updated in an August 31, 2021, letter issued from Laura Spears, which included the additional area provided in the revised

ISI request. Copies of the above letters are included in Appendix A and indicates there are not cultural or historic concerns for this parcel.

3.7.3 Critical Habitats and Endangered Resources

The Wisconsin Department of Natural Resources (WDNR) has conducted a review of the area for occurrences of Endangered, Threatened, or Special Concern Species, natural communities, or State Natural Areas in accordance with Wis. Stat. §26.604(4). Per WDNR review and subsequent letter, there are no record of the above occurrences that would be impacted by the proposed project. A copy of the recent endangered resource report from the WDNR is provide in Appendix A.

The WDNR's review of the Surface Water Data Viewer (SWDV) indicated a location within the proposed project area that may have wetland indicators. As suggested in the WDNR's ISI response's, the area of potential wetland indicators was inspected by an assured wetland delineator on May 4, 2021. The field visit was conducted under temperature that were normal and precipitation conditions that were drier than normal as compared to the historical average for the region according to USDA Field Office Climate Data WETS tables from the Viroqua, WI Station in Vernon County. The drier than normal conditions did not hinder the investigation for wetlands. The May 4, 2021 inspection concluded that no areas meeting the technical criteria for wetland are present within the area investigated. A copy of the memorandum documenting the wetland inspection is provided in Appendix B.

3.8 Federal Aviation Administration

The proposed landfill expansion is located approximately 2.7 miles (>15,840 feet) northeast of the closest runway at the Viroqua Airport and is not located in the approach or departure path for the airport. Since the expansion is located less than 5 miles from the airport, the County has issued a letter dated October 23, 2020 to the Federal Aviation Administration (FAA) notifying them of their intent to expand. A copy of the notification letter is attached in Appendix F, "FAA Correspondence."

Review of applicable regulations regarding landfill siting and expansions near airports indicate that the requirements of 49 USC Section 44718(d) apply only to new municipal solid waste landfills (MSWLF's), which are defined as a municipal waste landfill that was established or constructed after April 5, 2000. Furthermore, FAA Advisory Circular AC No. 150/5200-34A states that 49 USC Section 44718(d) does not apply to the expansion or modification of an existing MSWLF. The current active Vernon County Landfill was first constructed in 1993, therefore exempt from the limitations of 49 USC Section 44718(d).

As part of the last expansion process, Vernon County issued a letter to the FAA on May 29, 2002 notifying interested parties of their intention to expand. In a letter dated June 16, 2002 the FAA responded with a letter concurring with the proposal relative to compatibility standards contained in FAA Advisory Circular AC No. 150/5200-33, with the following conditions:

1. The landfill facility must be properly supervised to assure that the bird populations are not increasing and that appropriate control procedures are being followed.
2. Any increases in bird activity that might be hazardous to safe aircraft operations will result in prompt mitigation actions and/or closure of the landfill

3. The above conditions must be clearly defined via State/Local licensing procedures associated with establishment of the landfill.
4. The landfill owner/operator should develop and implement a Wildlife Hazard Management Plan for operation of the landfill.

A Wildlife Hazard Management Plan (Plan) was included in their Plan of Operation, which has been approved by the WDNR and part of the facility operating record. The Plan utilizes the following strategies:

- Minimization of standing water areas
- Minimization of uncovered waste areas
- Prompt revegetation of disturbed areas outside of the waste footprint
- Utilization of bird harassment techniques, perch deterrents, and avoidance structures, as needed

The FAA does not approve or disapprove of solid waste landfill locations but is primarily concerned about location relative to safety. With issuance of the attached notification letter, it is anticipated that the FAA may reply with additional conditional actions to address safety concerns.

In an electronic mail dated March 19, 2021 Bobb Beauchamp, Environmental Protection Specialist with the FAA, confirmed that the landfill expansion is exempt from the requirements of 49 USC Section 44718(d) and encouraged the continued use and implementation of the Plan. The FAA also indicated that the Viroqua Airport does not have regularly scheduled service in addition to general aviation operations, so the provisions of FAA AC 150/5200-34A, Construction or Establishment of Landfills Near Public Airports also does not apply.

Mr. Beauchamp was contacted again on August 31, 2021, to confirm the FAA's response remains unchanged with the addition of the area to the north and east being considered for landfill expansion. No additional response has been received as of the date of this report. However, no additional response may be received as Mr. Beauchamp specifically indicated the referenced provisions do not apply to landfills that were constructed or operated prior to April 5, 2000.

A copy of the October 23, 2020, notification and March 19, 2021 FAA response is included in Appendix F.

3.9 Transportation and Access

No changes are proposed to the existing landfill access. The main roads leading to Viroqua and the landfill include US14/State Highway (STH) 27 to the north, STH56 from the West, STH56/82 from the east, US14 from the south, and STH27/82 from the southwest. Once in Viroqua, or Westby to the north, access to the landfill is gained by turning east on County Road (CR) Y from US14/STH27. Travelling east on CR Y, then turn south on CR LF to the landfill property entrance located on the north side of CR LF. There are no weight restrictions on US14 and STH56, STH82 or STH 27. The county roads have weight restrictions during a brief period in the spring which 6 tons for single axle vehicles and 10 tons for double axle vehicles. Weight restrictions are not enforced on local town roads.

4 Physiographical and Geological Setting

4.1 Topography

The proposed landfill expansion is located in an unglaciated portion of Wisconsin known as the "Driftless" region. Topography within this area is typified by systems of bedrock ridges cut by stream and river valleys. The ridge and valley system is present in the immediate vicinity of the site, with elevations ranging from approximately 1040 feet MSL to 1260 feet MSL within the site boundaries (USGS Avalanche Quadrangle, 2018). Generally, the lower elevations are present to the north along the Seas Branch drainage, and to the southeast along an unnamed discontinuous drainage. A system of bluffs forms the higher elevations generally through the central portion of the site. The proposed horizontal expansion area is along the top of this bluff system. Surface water from the site generally flows either to the north toward Seas Branch (recently improved trout stream) or to the southeast (toward the unnamed discontinuous drainage way) and then northeast along this drainage way.

4.2 Hydrology

The site is located within the West Fork Kickapoo River Watershed, which is part of the Lower Wisconsin River Drainage Basin with regional surface water eventually draining to the Mississippi River approximately five miles south of Prairie du Chien, Wisconsin (Wojahn, 2019). Surface water in the area drains to the Seas Branch (north of the site) and an unnamed drainage (southeast portion of the site) which both feed into the West Fork of the Kickapoo River. The West Fork of the Kickapoo River flows to the south, meeting the Kickapoo River, and eventually the Wisconsin River.

Significant surface water bodies near the site include Seas Branch, and an associated impoundment (approximately one quarter to one half mile north and northeast of the site respectively), an unnamed discontinuous drainage way flowing through the southeast portion of the site, and the West Fork of the Kickapoo River (approximately three miles east of the site). Other than the impoundment of Seas Branch, no significant lakes are present in the immediate vicinity of the site. Additional unnamed drainage ways are also present in small valleys and swales throughout the region.

The Wisconsin Wetland Inventory Map does not identify wetlands within the proposed landfill expansion area. A wetland area is identified on the shorelines of Seas Branch just west of the impoundment area, approximately ½ mile northeast of the site. Six wetland class points too small to delineate are located along the shoreline of Seas Branch to the northwest, north and northeast of the site. Three wetland class points identified as dammed pond are identified on the landfill property to the southeast of the proposed landfill expansion area. No other wetlands were identified in the immediate proximity of the proposed landfill expansion area.

4.3 Geology

4.3.1 Near Surface Soils

Based on review of the Soil Survey for Vernon County (USDA, 2021), the near surface soils comprising the proposed horizontal expansion area include the following soil types.

- Mt. Carroll Silt Loam (114B2), 2 to 6 percent slopes, moderately eroded, well drained. These soils are typically loess.

- Seaton Silt Loam (115D2), driftless ridge, 12 to 20 percent slopes, moderately eroded, well drained. These soils are typically loess.
- Valton Silt Loam (133C2), 6 to 12 percent slopes, moderately eroded, well drained. These soils are typically loess over clayey pedisediment derived from dolomite.
- Pepin Silt Loam (125D2), 12 to 20 percent slopes, moderately eroded, well drained. These soils are typically loess over clayey pedisediment derived from dolomite over skeletal loamy residuum weathered from dolomite.

4.3.2 Unconsolidated Deposits

Unconsolidated deposits generally consist of loess as well as clay soils generated from weathering of dolomite bedrock (ridges) along with alluvium and lacustrine deposits in the river and stream valleys. These soils are typically fine grained and range from silts and clays (above dolomite bedrock ridges) to sands (valley floors). The thickness of unconsolidated deposits generally range from 0 to 50 feet throughout the area (Hindall, 1974).

4.3.3 Bedrock Geology

The uppermost bedrock unit at the site consists of Ordovician aged dolomites of the Prairie du Chien Group, most likely the Oneota Formation, which generally occur as the uppermost bedrock unit on the ridges in this area of southwestern Wisconsin (Gaffield, et al, 1998). Thickness of the Prairie du Chien group deposits ranges from 0 to approximately 250 feet (Hindall, 1974).

Underlying the Prairie du Chien group is the Cambrian aged sandstone bedrock. The Cambrian sandstone is typically the uppermost bedrock unit in the weathered stream valleys in the proximity of the site. In southwestern Wisconsin, the Cambrian sandstone unit is generally up to 1200 feet thick, and includes the Jordan Sandstone (uppermost unit), St. Lawrence Formation, Tunnel City Formation, Wonewoc Formation, Eau Claire Sandstone, and Mount Simon Sandstone (bottom unit). The Cambrian sandstone sequence is underlain by thousands of feet of basement, Precambrian crystalline igneous and metamorphic rock.

4.4 Hydrogeology

There are three major aquifers used for potable water production in the Lower Wisconsin River basin. The aquifers are, in order of importance, the sandstone aquifer, the sand and gravel aquifer, and the Galena-Platteville aquifer. The sandstone aquifer is present in saturated portions of Cambrian sandstone bedrock, with well yields of up to 1850 gpm. The sand and gravel aquifer (where present) utilizes groundwater in saturated unconsolidated sand and gravel deposits, mostly in river and stream valleys. Well yields of up to 2000 gpm are reported in the sand and gravel aquifer (Hindall, 1974). The Platteville-Galena aquifer (where present) produces water from saturated portions of the Platteville Galena dolomite; however, the Platteville Galena dolomite does not occur at the landfill site.

Regionally, groundwater generally flows to the southeast, toward the Kickapoo River in the western portion of Vernon County (Hindall, 1974). Locally, groundwater contours typically somewhat mirror surface topography, with groundwater flowing from areas of higher surface elevation towards the valleys, ultimately feeding into streams as groundwater discharge areas in lower elevations.

The sand and gravel aquifer are not present in the proposed landfill expansion area. The sandstone aquifer would be the only aquifer available for use within the proposed landfill

expansion area. Groundwater elevation in the proximity of the landfill expansion area is estimated to be approximately 1100 ft MSL (Hindall, 1974).

4.5 Water Quality

4.5.1 Groundwater

Groundwater in the Lower Wisconsin River basin is generally of very good quality and is usable for most purposes. The main chemical constituents in the groundwater within the basin are calcium, magnesium, and bicarbonate ions, which are derived primarily from solution of dolomite and limestone bedrock (Gaffield, et al, 1998). Regional differences in groundwater quality occur due to regional variability in the soil and rock through which the groundwater moves (Hindall, 1974).

Hardness as calcium carbonate is above 180 mg/L in 80 percent of sampled wells, and above 225 mg/L in 65 percent of sampled wells. This indicates hard water, and softening is often required for many domestic uses. The median dissolved solids content is approximately between 260 and 350 mg/L in groundwater in the drainage basin (Hindall, 1974).

4.5.2 Surface Water

The chemical quality of surface water in the Lower Wisconsin River basin is generally good and relatively unpolluted, although the water is generally hard (181 mg/L or greater) outside of the Wisconsin River itself. Specific conductance generally ranges from approximately 300 to 500 micromhos, except for in the Wisconsin River, where specific conductance ranges from 150 to 300 micromhos (Hindall, 1974). Since, groundwater in the region tends to feed surface water, the dominant chemical ions in surface water from the Lower Wisconsin River basin are also calcium, magnesium, and bicarbonate ions (Gaffield, et al, 1998).

5 Conclusion and Desired Action

It is Vernon County's opinion that the proposed expansion is in compliance with the locational criteria and will be designed in accordance with the performance standards outlined in s. NR 504.04(3) & (4) Wis. Adm. Code. Accordingly, Vernon County requests the WDNR provide an opinion of this ISR regarding the suitability of the proposed expansion, prior to exhausting additional resources relating to the feasibility study and report.

dmk

6 References

Gaffield, S.J., Bradbury, K.R., Potter, K.W., 1998, “Hydrologic Assessment of the Kickapoo Watershed, southwestern Wisconsin”, UW Extension Geological and Natural History Survey.

Hindall, S.M., and Borman, R.G. 1974, “Water Resources of Wisconsin – Lower Wisconsin River Basin.” U.S. Geological Survey Hydrologic Investigations, Atlas HA-479.

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U.S. Department of Agriculture (USDA), 2021, Web Soil Survey (WSS), National Cooperative Soil Survey, USDA Natural Resources Conservation Service (NRCS), accessed November 4, 2021 (https://websoilsurvey.nrcs.usda.gov/app/).

USGS 2018, “Avalanche Quadrangle 7.5 Minute Series Topographic Map.”

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Figures

Figure 1 – Preliminary Waste Footprint
Figure 2 – Preliminary Subbase Grades
Figure 3 – Preliminary Base Grades
Figure 4 – Preliminary Final Closure Grades

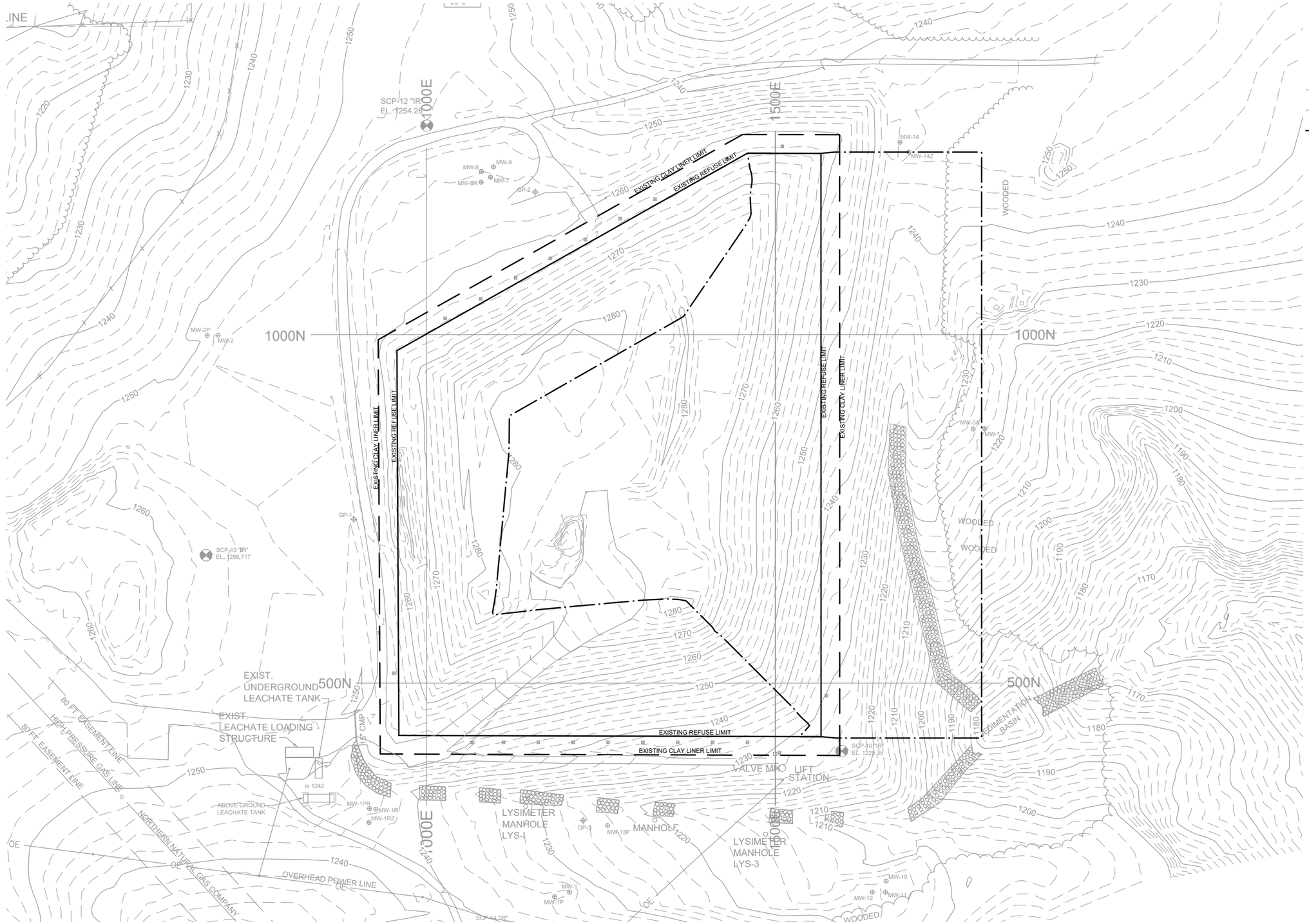
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GENERAL NOTES:

1. CONTOUR INTERVAL IS 2-FOOT.

LEGEND:

- 1240 — EXISTING GRADE MAJOR CONTOUR
- EXISTING GRADE MINOR CONTOUR
- PROPOSED WASTE LIMITS



NO	DATE	BY	REMARKS
	08/27/2021	DRH	ISSUED FOR REVIEW

REVISIONS

DESIGNED: TTR	CHECKED: DRH
DRAWN: TTR	CHECKED: BLK
DATE: 08/27/2021	APPROVED: DRH

PLANS PREPARED BY:
SEH
329 JAY STREET
SUITE 301
LA CROSSE, WI 54601-4034
PHONE: 1.608.782.3161
www.sehinc.com

PLANS PREPARED FOR:
VERNON COUNTY SOLID WASTE DEPT
53705 CTH LF
VIROQUA, WISCONSIN

PROJECT/CONTRACT NO: VERNON COUNTY
SEH PROJECT NO: VERSW 157634
FILE NAME: VC157634FIG1

VERNON COUNTY LANDFILL
INITIAL SITE REPORT
VIROQUA, WISCONSIN

PRELIMINARY WASTE FOOTPRINT

FIG 1

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GENERAL NOTES:

1. CONTOUR INTERVAL IS 2-FOOT.
2. PROPOSED CONTOURS REPRESENT TOP OF CLAY SUBBASE ELEVATIONS.

LEGEND:

- 1240 EXISTING GRADE MAJOR CONTOUR
- EXISTING GRADE MINOR CONTOUR
- 1240 PROPOSED SUBBASE MAJOR CONTOUR
- PROPOSED SUBBASE MINOR CONTOUR
- PROPOSED WASTE LIMITS

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SCALE IN FEET

NO	DATE	BY	REMARKS
	08/27/2021	DRH	ISSUED FOR REVIEW

REVISIONS

DESIGNED	CHECKED
TTR	DRH
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DATE	APPROVED
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VIROQUA, WISCONSIN

PROJECT/CONTRACT NO	VERNON COUNTY
SEH PROJECT NO	VERSW 157634
FILE NAME	VC157634FIG2

VERNON COUNTY LANDFILL
INITIAL SITE REPORT
VIROQUA, WISCONSIN

PRELIMINARY SUBBASE GRADES

FIG 2

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GENERAL NOTES:

1. CONTOUR INTERVAL IS 2-FOOT.
2. PROPOSED CONTOURS REPRESENT TOP OF CLAY BASE ELEVATIONS.

LEGEND:

- 1240 — EXISTING GRADE MAJOR CONTOUR
- EXISTING GRADE MINOR CONTOUR
- 1240 — PROPOSED BASE MAJOR CONTOUR
- PROPOSED BASE MINOR CONTOUR
- PROPOSED WASTE LIMITS

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SCALE IN FEET

NO	DATE	BY	REMARKS
	08/27/2021	DRH	ISSUED FOR REVIEW

REVISIONS

NO	DATE	BY	REMARKS

REVISIONS

DESIGNED TTR	CHECKED DRH
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DATE 08/27/2021	APPROVED DRH

PLANS PREPARED BY:

SEH
329 JAY STREET
SUITE 301
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VERNON COUNTY SOLID WASTE DEPT
53705 CTH LF
VIROQUA, WISCONSIN

PROJECT/CONTRACT NO: VERNON COUNTY
SEH PROJECT NO: VERSW 157634
FILE NAME: VC157634FIG3

VERNON COUNTY LANDFILL
INITIAL SITE REPORT
VIROQUA, WISCONSIN

PRELIMINARY BASE GRADES

FIG 3

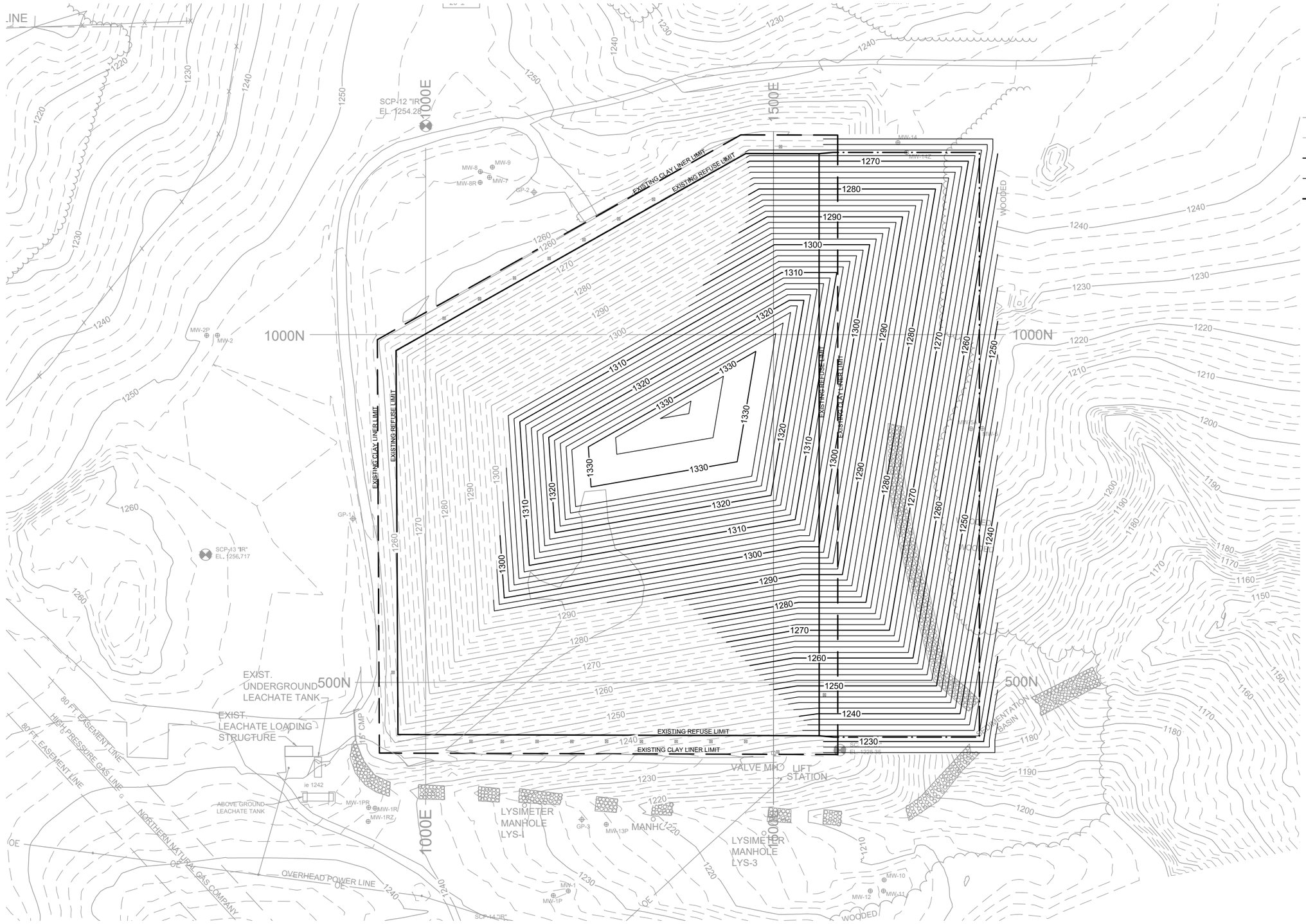
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GENERAL NOTES:

1. CONTOUR INTERVAL IS 2-FOOT.
2. PROPOSED CONTOURS REPRESENT FINAL CLOSURE ELEVATIONS.

LEGEND:

- 1240 EXISTING GRADE MAJOR CONTOUR
- EXISTING GRADE MINOR CONTOUR
- 1240 PROPOSED CLOSURE MAJOR CONTOUR
- PROPOSED CLOSURE MINOR CONTOUR
- PROPOSED WASTE LIMITS



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								DRAWN TTR	CHECKED BLK
	08/27/2021	DRH	ISSUED FOR REVIEW					DATE 08/27/2021	APPROVED DRH
NO	DATE	BY	REMARKS	NO	DATE	BY	REMARKS		
REVISIONS				REVISIONS					

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VERNON COUNTY SOLID WASTE DEPT
53705 CTH LF
VIROQUA, WISCONSIN

PROJECT/CONTRACT NO: VERNON COUNTY
SEH PROJECT NO: VERSW 157634
FILE NAME: VC157634FIG4

VERNON COUNTY LANDFILL
INITIAL SITE REPORT
VIROQUA, WISCONSIN

PRELIMINARY FINAL CLOSURE GRADES

FIG 4
4 OF 4

X:\UZ\VV\VERSW\157634\5-FINAL-DSGN\51-DRAWINGS\85-HEAVYCIV\INITIAL SITE REPORT\SHEETS\VC157634FIG4.DWG

Appendix A

ISI Request and WDNR Response

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg WI 53711-5397

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

November 1, 2021

File Ref: FID 663038310
Vernon County
SW/CORR

Ms. Stacie Sanborn
Vernon County Solid Waste and Recycling Center
S3705 County Hwy LF
Viroqua, WI 54665

Subject: Supplemental Initial Site Inspection Opinion Letter - Proposed Expansion to Vernon County Landfill, License #3268

Dear Ms. Sanborn:

This letter documents a second initial site inspection (ISI) performed by the Department of Natural Resources (department) on September 30, 2021, for additional areas of the proposed expansion of the Vernon County Landfill. Waste Management Engineer Martin Herrick and Hydrogeologist Carolyn Cooper conducted the inspection. The purpose of the inspection was to identify any potential conflicts the additional areas of the proposed expansion might have with the location and performance standards in s. NR 504.04, Wis. Adm. Code. This letter supplements the department's December 15, 2020 ISI opinion letter for the proposed expansion. All comments and recommendations contained in the previous response letter remain valid.

As part of the inspection, the department evaluated the information in SEH's September 3, 2021 revised ISI request submitted on behalf of Vernon County. The revised ISI request proposes an area to the north and east of the existing landfill for a potential landfill expansion, in addition to the areas to the north and west of the landfill that were considered in the original ISI. The revised request notes that soil borings advanced in May 2021 encountered shallow bedrock to the west of the active landfill cell. This finding, along with topographic and property boundary limitations to the west and northwest of the landfill, prompted Vernon County to consider the area north and east of the existing landfill for possible landfill development. The revised ISI states that the proposed expansion is in the South ½ of Section 15, T13N, R4W. Please review this description for accuracy and provide future site location descriptions to the ¼-¼ Section level.

According to the ISI request, the proposed expansion would consist of a contiguous 10-acre horizontal expansion to the west, north or east (or a combination thereof) of the currently permitted active MSW landfill (License #3268) and a vertical expansion over a portion of the active landfill. As observed during the inspection, the horizontal expansion area consists of open, grassy areas adjacent to the existing active landfill with wooded areas farther to the north, northeast and east. The landfill's sedimentation basin is located within the proposed expansion area east of the landfill. Features within the proposed expansion area north and west of the landfill include the leachate loadout area, access roads to the active landfill and the closed construction and demolition (C&D) landfill, a wooden shed, and a soil stockpile area. Any impacts or changes to the existing features would be described in the Initial Site Report (ISR) and feasibility report.

Based on the review of the documents included with the September 3, 2021 ISI request and observations from the site inspection, the department's preliminary opinion regarding the suitability of site location is that the site location has potential. The only conflict with the locational criteria contained in s. NR 504.04(3), Wis. Adm. Code, that was identified is a water supply well located within 1,200 feet of the proposed expansion boundary or the currently approved waste limits.

Regarding the performance standards contained in s. NR 504.04(4), Wis. Adm. Code, the department's review of the Surface Water Data Viewer (SWDV) shows a location within the proposed project area west of the existing landfill with wetland indicators that should be checked by an assured wetland delineator. If there are conflicts that cannot be satisfactorily addressed in accordance with applicable requirements, then they would be constraints to site development.

Summary of Locational Criteria: As described in s. NR 504.04(3)(a) to (i), Wis. Adm. Code, there are several locational criteria that apply to the proposed landfill expansion. The proposed limits of filling may not be located within:

(a) *1,000 feet of any navigable lake, pond or flowage.* The ISI request states that there is not a navigable lake, pond, or flowage within 1,000 feet of the proposed expansion; however, the landfill's existing sedimentation basin, a manmade stormwater detention pond east of the landfill, is located within 1,000 feet of the proposed expansion. As a sediment control feature, this pond would be excluded from the setback requirement. The pond may need to be moved and/or enlarged to accommodate a proposed expansion of the landfill. Details of the stormwater management system would be provided in the feasibility report.

(b) *300 feet of any navigable river or stream*. According to the ISI request, the proposed expansion is not within 300 feet of a navigable river or stream. The department's SWDV map also indicates the proposed expansion is not within 300 feet of a navigable river or stream.

(c) *A floodplain*. According to the ISI request, the proposed expansion is not within a floodplain. The department's SWDV map also indicates this area is not in a floodplain.

(d) *1,000 feet of the nearest edge of the right-of-way of any state trunk highway, interstate or federal aid primary highway or the boundary of any public park or state natural area, unless the landfill is screened.* According to the ISI request, there are no state trunk highways, interstate or federal aid primary highways within 1,000 feet of the proposed site. US Highway 14/61 and State Highway 27 are the closest features and would be over 12,500 feet from the proposed site. The ISI request states that there are no public parks or state natural areas within 1,000 feet of the limits of the current landfill or expansion footprint.

(e) *An area where the design or operation of the landfill would pose a significant bird hazard to aircraft.* According to the ISI request, there are no airport runways within 10,000 feet of the proposed landfill expansion. The closest runway at the Viroqua Airport is located approximately 15,840 feet (2.7 miles) southwest of the proposed landfill expansion, and the landfill is not located in the approach or departure path for the airport. Because the proposed expansion is within 5 miles of this runway, notification to the Federal Aviation Administration (FAA) is required. The revised ISI request included a copy of the October 23, 2020 notification made by SEH to the FAA on behalf of Vernon County and the FAA's March 19, 2021 response indicating that the FAA did not object to the proposed expansion. SEH contacted the FAA again on August 31, 2021 to confirm that the agency does not object to the revised expansion proposal. As of the date of this letter, a response from the FAA has not been received. Section NR 509.06(3), Wis. Adm. Code, requires inclusion of the response letters from the FAA in the ISR.

(f) *1,200 feet of any public or private water supply well*. The ISI request states that no public or private wells are located within 1,200 feet of the proposed expansion boundary, except for the well serving the landfill office and recycling facility (Wisconsin Unique Well Number [WUWN] FU046). The ISI request states that a variance for the setback requirement for this well was granted prior to constructing the initial landfill cell. If Vernon County pursues expansion of the landfill within the 1,200-foot setback zone, please request and justify an exemption to this locational criterion or provide an alternative water supply

for this property. If the proposed limits of waste would extend closer to the well than currently approved or be located in a different gradient position with respect to groundwater flow from the water supply well, then a new NR 812 well variance application may be required.

The Chad B. Williams well, located at E8263 North Asbury Road, is sampled semiannually as part of the landfill's environmental monitoring program. Please confirm the WUWN for this well and note whether the well is located within 1,200 feet of the proposed expansion boundary. An NR 812 well variance application may be required. Further discussion regarding public and private wells in the area would be addressed in the feasibility report.

(g) *200 feet of a fault that has had displacement in Holocene time*. The ISI request states that the proposed expansion is not within 200 feet of a fault that has had displacement since Holocene time. Further discussion regarding the geologic stability of the area would be addressed in the feasibility report.

(h) *Seismic impact zone*. The ISI request concludes that the site is in an area of very low seismic hazard based on United States Geological Survey (USGS) information.

(i) *Unstable areas*. The ISI request states there is no evidence of unstable conditions at the site based on known current or historical data. Further discussion regarding the geologic stability of the area would be addressed in the feasibility report.

It appears that the site meets or could be constructed and operated to meet the performance standards in s. NR 504.04(4), Wis. Adm. Code.

(a) Wetland Areas - Based on information provided in the ISI request, review of the SWDV and the site inspection, no regulated wetlands were identified within the proposed project area at this time. However, as noted in the department's previous ISI opinion letter, the SWDV identified a location within the proposed expansion area west of the landfill as a potential wetland indicator based on soil type and/or wet area. Vernon County should have this area checked by an assured wetland delineator during the growing season and provide the findings in the ISR.

(b) Critical Habitat Areas - Based on a review of the Natural Heritage Inventory, no element occurrences were identified as existing in the area. Therefore, it appears unlikely that there would be any significant adverse impact on critical habitat areas or endangered or threatened species due to the proposed expansion. As the proposed project progresses through the siting process, additional reviews by department staff may be done at different stages to update the NHI review.

Archaeological issues and historical structures for the proposed expansion area were cleared by Richard Kubicek, Departmental Archaeologist/Departmental Historic Preservation Officer, on November 10, 2020. An August 31, 2021 letter from Laura Spears, Wastewater Specialist – Stormwater, provided in revised ISI request, documents that another review for archaeological sites was performed for the S ½ of Section 15, Township 13 North, Range 4 West in the Town of Viroqua, which did not show archaeological sites. Additional reviews may be done at the ISR and feasibility report stages as the landfill footprint and locations of other supporting structures become known.

The performance criteria outlined in s. NR 504.04 (4) (c) through (f), Wis. Adm. Code, include evaluation of surface water, groundwater, gas migration and air contaminant impacts. These performance criteria would be evaluated during the department's review of a feasibility report for the proposed expansion.

Please remember that s. NR 504.06(2)(c), Wis. Adm. Code, requires the separation from the top of the bedrock surface and the bottom of the clay liner to be at least 10 feet.

Section NR 504.04(4)(d), Wis. Adm. Code, requires submittal of a 7.5 Minute USGS map or equivalent with a scale of 1 inch=500 feet. The ISI request included topographic map with a scale of a 1 inch=750 feet; however, a 1 inch=500 feet scale map will be required in the ISR submittal. Several maps at this scale may be needed to show all of the items listed in this code section, which include the depiction of contour intervals to sufficiently show relief, surface waters, floodplains, existing land use conditions, public parks, and all water supply wells and residences located within one mile of the property boundaries of the proposed landfill.

Section NR 504.09(2)(f), Wis. Adm. Code, requires a minimum separation distance of 100 feet be maintained between the limits of filling and the adjacent property line. A minimum distance of 50 feet must be maintained between any permanent berms or excavations associated with the landfill, excluding stormwater diversion structures, and the adjacent property line.

The locational and performance criteria will be evaluated again as the department reviews the ISR and feasibility report. Please keep in mind that as the department continues its review of the proposed expansion and as new information is presented, additional questions or concerns may arise, or requests for further information may be made before a feasibility determination is made.

Please do not hesitate to contact me at 608-931-9387 or carolyn.cooper@wisconsin.gov if you have any questions about this letter.

Sincerely,



Carolyn Cooper, P.G.
Hydrogeologist
South Central Region

cc: Brian Kent, SEH
Darryl Heaps, SEH
Martin Herrick, DNR-WA
John Morris, DNR-WA
Natasha Gwidt, DNR-WA
Joe Lourigan, DNR-WA
Valerie Joosten, DNR-WA

Initial Site Inspection Request

Vernon County Landfill

Viroqua, Wisconsin

WDNR License No. 3268

VERSW 157634 | November 4, 2020, Revised September 3, 2021

SEH

Building a Better World for All of Us®

Engineers | Architects | Planners | Scientists

Building a Better World for All of Us®

September 3, 2021

RE: Vernon County Landfill
Initial Site Inspection Request
Viroqua, Wisconsin
WDNR License No. 3268
SEH No. VERSW 157634

Ms. Carolyn Cooper, Hydrogeologist
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711-5367

Dear Ms. Cooper:

Short Elliott Hendrickson Inc. (SEH®), on behalf of the Vernon County Solid Waste Department, is submitting this revised Initial Site Inspection (ISI) report to request the Wisconsin Department of Natural Resources (WDNR) provide a preliminary opinion regarding the suitability of additional area to the north and east of the existing landfill for municipal solid waste landfill expansion development. This ISI Request includes a report narrative supplemented by figures and appendices that provide preliminary expansion information as it relates to compliance with the applicable locational criteria and performance standards of s. NR 504.04 Wisconsin Administrative Code.

This report was prepared in accordance with s. NR 509.04 Wisconsin Administrative Code. We believe the ISI is complete and request your timely review. Should you have any questions or would like to discuss the proposed expansion further, please contact me at 608.498.4844.

Sincerely,

Brian L. Kent, CHMM
Project Manager

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Initial Site Inspection Request

Vernon County Landfill
Viroqua, Wisconsin

Prepared for:
Vernon County Solid Waste
Viroqua, Wisconsin

Prepared by:
Short Elliott Hendrickson Inc.
329 Jay Street, Suite 301
La Crosse, WI 54601-4034
608.782.3161

I, Darryl R. Heaps, hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.

E-25799		9/3/2021
Darryl R. Heaps, PE, CHMM	PE Number	Date
Senior Engineer		

WISCONSIN
DARRYL R. HEAPS
E-25799-6
ST. PAUL, MN
PROFESSIONAL ENGINEER

9/3/2021	
Brian L. Kent CHMM	Date
Project Manager	

SEH

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Distribution

No. of Copies	Sent to
1	Marty Herrick, PE Waste Management Engineer Wisconsin Department of Natural Resources 3050 Mormon Coulee Road La Crosse, WI 54601
1	Stacie Sanborn Director of Solid Waste Vernon County Solid Waste Department S3705 County Road LF Viroqua, WI 54665
1	WDNR - Bureau of Waste Management 101 S. Webster Street PO Box 7921 Madison, WI 53707
1	Carolyn Cooper, PG Hydrogeologist Wisconsin Department of Natural Resources 3911 Fish Hatchery Road Fitchburg, WI 53711
1	Darryl Heaps, PE SEH 3535 Vadnais Center Drive St. Paul, MN 55110

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Initial Site Inspection Request

Vernon County Landfill

Prepared for Vernon County Solid Waste

1 Introduction

1.1 Purpose

The Vernon County Landfill (WDNR License No. 3268) proposes to expand the existing landfill for disposal of municipal solid waste, commercial and industrial waste. Short Elliott Hendrickson Inc. (SEH®), on behalf of Vernon County (County), is issuing this revised Initial Site Inspection (ISI) report to request additional area to the north and east of the existing landfill be evaluated by the WDNR for the purpose of evaluating compliance with the applicable locational criteria and performance standards specified under s. NR 504.04 Wisconsin Administrative Code. Preliminary soil borings performed in May 2021 encountered shallow bedrock to the west of the active landfill cell. This consideration, along with topographic and property boundary limitations to the west and northwest prompted the area north and east of the existing landfill to be evaluated for landfill development and, therefore, this revised ISI.

An ISI request was submitted to the WDNR on November 4, 2020. The WDNR completed a site inspection on November 18, 2020, and issued a response on December 15, 2020. The WDNR's preliminary opinion regarding the suitability of site location of the original ISI request was the site has potential for landfill development. This ISI is being re-submitted in its entirety and includes additional area to the north and east as well as the original area presented in the November 4, 2020, ISI request.

1.2 Landfill Initial Site Inspection Checklist

Appendix A, "ISI Request Checklist" includes a completed Landfill Initial Site Inspection Request Completeness Checklist (WA1184). The checklist was utilized by SEH to confirm correct and sufficient data is provided to the WDNR in accordance with s. NR 509.04 Wisconsin Administrative Code, and as a quick reference guide to the WDNR reviewer for location of applicable information contained in this report.

2 General Information

The Vernon County Solid Waste Department owns and operates an integrated waste management system on approximately 250-acres located in the Town of Viroqua, Wisconsin. The integrated waste management system includes:

- An approximate 10-acre municipal solid waste landfill, with an approximate design capacity of 590,000 cubic yards (WDNR License No. 3268)
- A closed small sized (50,000 cubic yard) C&D Landfill (WDNR License No. 3712)
- A recyclable material processing and baling facility

2.1 Proposed Operation

The County is proposing to permit a horizontal and vertical expansion for the municipal waste landfill (WDNR License No. 3268). The approximate waste footprint for the proposed expansion is shown on the attached Figure 1 through Figure 5. Please note that the approximate footprint presented is not anticipated to cover the entire area shown, but bounds the areas currently being considered for the expansion. It is anticipated that the proposed expansion footprint will be less than 10-acres. The landfill will continue to accept waste from regional haulers and municipalities located in Vernon County. The proposed expansion is described as following:

- Contiguous horizontal expansion of approximately 10-acres to the west, north, or east (or combination thereof).
- Vertical expansion with a vertical overlay onto the existing landfill.

2.2 Location

The current landfill and proposed expansion are located in the South half of Section 15, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin. The physical address for the Solid Waste Department is S3705 County Road LF, Viroqua, Wisconsin 54665.

2.3 Owner/Applicant

The Owner and Applicant are as follows:

Vernon County Solid Waste Department
C/O Stacie Sanborn, Solid Waste Director
S3705 County Road LF
Viroqua, WI 54665

2.4 Authorized Contacts

Authorized contacts are as follows:

OWNER
Stacie Sanborn, Solid Waste Director
Vernon County Solid Waste Department
S3705 County Road LF
Viroqua, WI 54665
608.634.2900

CONSULTANT
Brian L. Kent, CHMM
SEH
329 Jay Street, Suite 301
La Crosse, WI 54601
608.498.4844

2.5 Present Land Use

Presently the property is utilized for active solid waste disposal relating to the active landfill cell. The property also includes a closed small sized C&D landfill located northeast of the active MSW

landfill. Several buildings are located near the entrance to the property which serve as the scale house, landfill office space, and accommodate the recycling processing operations.

The approximate 22-acres under consideration for the proposed horizontal expansion consist of vacant open grassland, forest, and the existing landfill's sedimentation basin. Portions of the area currently contain soil stockpiles for use in day to day landfill operations.

3 Endangered and Archeological Resources {NR509.04(4)(b)}

3.1 Endangered Resources

The Wisconsin Department of Natural Resources (WDNR) has conducted a review of the area for occurrences of Endangered, Threatened, or Special Concern Species, natural communities, or State Natural Areas in accordance with Wis. Stat. §26.604(4). Per WDNR review and subsequent letter, there are no record of the above occurrences that would be impacted by the proposed project.

A copy of the recent endangered resource report from the WDNR is provide in Appendix B, "ER/NHI Report" for your review.

3.2 Archeologic Resources

As required by Wis. Stat. §44.40, the WDNR performed a review of the area to determine if any known historic, scientific, or archeological areas exist within the vicinity of the proposed facility. As indicated in the attached letter from the WDNR, the review indicates no archeological or historical findings within the proposed landfill property and proposed development site.

A copy of the letter from the WDNR is provided in Appendix B for your review.

4 Base Maps {NR509.04(4)(d)}

Attached Figure 1 through Figure 5 are base maps generated from data provided by the Vernon County Land Information Department and the USGS Avalanche quadrangle maps. Following is a summary of the attached figures relating to the required information.

- Figure 1 - Site Location: Provides location, topography/relief, and surface waters other than man-made storm water basins on the landfill property.
- Figure 2 - Residential and Private Wells Within 1-Mile of Horizontal Expansion: Includes an aerial photograph depicting residences, private wells and landowners within 1-mile of the existing and proposed landfill expansion limits. The attached Table 1, "Adjacent Property Owners" provides a listing of each of the landowners and/or residences located within 1,200 feet of the landfill footprint or contiguous to the landfill property.
- Figure 3 - Floodplains and Water Features Within 1-Mile of Horizontal Expansion: Identifies flood hazard areas and surface water bodies within 1-mile of the existing and proposed landfill expansion limits.
- Figure 4 - Topography Within 1-Mile of Horizontal Expansion: Provides topography for vicinity within 1-mile of the existing and proposed landfill expansion limits. The topography data was provided by the Vernon County Land Information Department and

is more current than the USGS map provided on Figure 1. Note the Figure 4 paper copy submitted with this ISI request is presented at a 1 inch = 500 feet scale per NR 504.04(4)(d).

- Figure 5 - Existing Land Use Within 1-Mile of Horizontal Expansion: Identifies the current land use and category for areas within 1-mile of the existing and proposed landfill expansion limits.

5 Potential Conflicts

Following is a summary of the locational and performance standards specified in s. NR 504.04 Wisconsin Administrative Code, and the compliance status of the proposed expansion relative to the requirements. The attached Table 2, "Locational Criteria and Performance Standard Summary" provides a summary of status of compliance with the locational and performance standards.

5.1 Locational Criteria

As discussed in the following sections, the preliminary review of the locational standard requirements for the proposed horizontal and vertical expansion do not indicate any potential conflicts.

5.1.1 Navigable Lake, Pond or Flowage {s. NR504.04(3)(a)}

The proposed expansion will not be located within 1,000 feet of a navigable lake, pond or flowage. One sedimentation basin is located within the proposed expansion area; however, the rule excludes landfill drainage or sedimentation control structures from the setback requirement. The closest water body to the existing landfill and proposed expansion is the Seas Branch Pond located greater than 4,000 feet to the northeast. According to the WDNR's Surface Water Data Viewer database, the Seas Branch pond is an approximate 11-acre flood control impoundment with poor water quality.

5.1.2 Navigable River or Stream {s. NR504.04(3)(b)}

The proposed expansion will not be located within 300 feet of a navigable river or stream. The closest navigable river or stream is the Seas Branch Stream located greater than 1,000 feet north of the proposed expansion. Additionally, an unnamed intermittent stream is located approximately 700 feet to the east of the proposed expansion. The intermittent stream appears to originate on the landfill property and heads northeast towards the Seas Branch Pond.

5.1.3 Floodplain {s. NR504.04(3)(c)}

As shown on Figure 3, the current landfill and proposed expansion footprint are not located in a flood hazard area or floodplain. The closest floodplain to the landfill footprint is located greater than 1,200 feet to the north in the Seas Branch Valley, which is significantly lower in elevation than the proposed expansion footprint.

5.1.4 State/Federal Highways, Public Park and Natural Areas {s. NR504.04(3)(d}

The existing landfill and proposed horizontal expansion are located greater than 1,000 feet from any State/Federal Highway, public park or natural area. The existing landfill and proposed horizontal expansion are located greater than 12,500 feet east of the right-of-way for US Highway 14/61 and State Highway 27. As indicated on Figure 5, there are no public parks or State natural areas within 1,000 feet of the limits of current landfill or expansion footprint.

5.1.5 Airport Safety {s. NR504.04(3)(e)}

The proposed landfill expansion is located approximately 2.7 miles (>15,840 feet) northeast of the closest runway at the Viroqua Airport and is not located in the approach or departure path for the airport. Since the expansion is located less than 5 miles from the airport, the County has issued a letter dated October 23, 2020 to the Federal Aviation Administration (FAA) notifying them of their intent to expand. A copy of the notification letter is attached in Appendix C, "FAA Correspondence."

Review of applicable regulations regarding landfill siting and expansions near airports indicate that the requirements of 49 USC Section 44718(d) apply only to new municipal solid waste landfills (MSWLF's), which are defined as a municipal waste landfill that was established or constructed after April 5, 2000. Furthermore, FAA Advisory Circular AC No. 150/5200-34A states that 49 USC Section 44718(d) does not apply to the expansion or modification of an existing MSWLF. The current active Vernon County Landfill was first constructed in 1993, therefore exempt from the limitations of 49 USC Section 44718(d).

As part of the last expansion process, Vernon County issued a letter to the FAA on May 29, 2002 notifying interested parties of their intention to expand. In a letter dated June 16, 2002 the FAA responded with a letter concurring with the proposal relative to compatibility standards contained in FAA Advisory Circular AC No. 150/5200-33, with the following conditions:

1. The landfill facility must be properly supervised to assure that the bird populations are not increasing and that appropriate control procedures are being followed.
2. Any increases in bird activity that might be hazardous to safe aircraft operations will result in prompt mitigation actions and/or closure of the landfill
3. The above conditions must be clearly defined via State/Local licensing procedures associated with establishment of the landfill.
4. The landfill owner/operator should develop and implement a Wildlife Hazard Management Plan for operation of the landfill.

A Wildlife Hazard Management Plan (Plan) was included in their Plan of Operation, which has been approved by the WDNR and part of the facility operating record. The Plan utilizes the following strategies:

- Minimization of standing water areas
- Minimization of uncovered waste areas
- Prompt revegetation of disturbed areas outside of the waste footprint
- Utilization of bird harassment techniques, perch deterrents, and avoidance structures, as needed

The FAA does not approve or disapprove of solid waste landfill locations but is primarily concerned about location relative to safety. A response from Mr. Bobb Beauchamp of the FAA was received on March 19, 2021, indicating the FAA concurs with the conclusions presented in the October 23, 2020 letter and has no objection to the proposed expansion. The written response from the FAA is provided in Appendix C. The FAA was contacted again via email on August 31, 2021, to confirm their response remains unchanged with the addition of area to the north and east being considered for landfill expansion. Confirmation has not yet been received as of the date of this report. Written confirmation from the FAA will be provided in the ISR.

5.1.6 Public & Private Wells {s. NR504.04(3)(f)}

As shown on Figure 2, there are no public or private wells located within 1,200 feet of the existing or proposed expansion landfill footprint except for the well serving the landfill office and recycling facility. A variance for the setback requirement for the recycling facility private well was issued to the County prior to constructing the initial landfill cell.

5.1.7 Halocene Era Faults {s. NR504.04(3)(g)}

According to the U.S Geological Survey (USGS) Earthquake Hazards Program Interactive Fault Map, there are no faults within the vicinity of the active or proposed expansion footprint. Appendix D, “USGS Maps” includes a map from the interactive mapping system showing known faults in the Midwest Region of the United States.

5.1.8 Seismic Impact Zones {s. NR504.04(3)(h)}

According to the USGS Earthquake Hazards Program U.S Seismic Hazards Map, the active or proposed expansion footprint, and most of Wisconsin in general, is located in an area of very low seismic hazard. Appendix D includes a copy of the USGS Seismic-Hazard Maps for the Conterminous United States, 2014.

5.1.9 Unstable Areas {s. NR504.04(3)(i)}

There is no known current or historic data for the site that would suggest that the current landfill or proposed expansion footprint is located in an unstable area. Further discussion relating to stability will be addressed in the Feasibility Report.

5.2 Performance Standards

As discussed in the following sections, the preliminary review of the performance standard requirements for the proposed horizontal and vertical expansion do not indicate any potential conflicts.

5.2.1 Impacts to Wetlands {s. NR504.04(4)(a)}

The proposed expansion will not have a significant adverse impact on wetlands. There are no wetlands present in the expansion area and storm water run-off from the area during construction and operation will be managed in accordance with applicable storm water regulations.

5.2.2 Endangered and Threatened Species {s. NR504.04(4)(b)}

The proposed expansion will not include a “take” of an endangered or threatened species. Please refer to Section 3 and Appendix B for more detail.

5.2.3 Detrimental Effects to Surface Water {s. NR504.04(4)(c)}

The proposed expansion will not have a detrimental effect on surface water quality assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. Surface water will be managed in accordance with applicable regulations and surface water management systems will be designed and maintained in accordance with industry best management practices. Details of the storm water management system design including any modifications to existing storm water structures will be provided in the Feasibility Report.

5.2.4 Detrimental Effects to Groundwater {s. NR504.04(4)(d)}

The proposed expansion will not cause or exacerbate an attainment or exceedance of a groundwater quality standard assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. The expansion will include a “state of the art” landfill liner and leachate collection system to prevent the release of contamination to the subsurface and groundwater. Details of the landfill design will be provided in the Feasibility Report.

5.2.5 Migration of Explosive Gas {s. NR504.04(4)(e)}

The proposed expansion will not cause the migration of explosive gases in excess of 25 percent of the lower explosive limit (LEL) assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. The expansion will include a “state of the art” landfill liner and expansion of the landfill gas collection system to minimize the migration and fugitive emission of methane to the atmosphere and subsurface. Details of the landfill design will be provided in the Feasibility Report.

5.2.6 Hazardous Air Emissions {s. NR504.04(4)(f)}

The proposed expansion will not cause the emission of any hazardous air pollutant (HAP) exceeding the limitations contained in s. NR445.07 Wisconsin Administrative Code assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. Details of the landfill gas collection and monitoring system design will be provided in the Feasibility Report.

DRH/hbh

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Tables

Table 1 – Adjacent Property Owners
Table 2 – Locational Criteria and Performance Standards Summary

Table 1

Adjacent Land Owners

MAP ID	PARCEL ID	OWNER	OWNER 2	POSTAL ADDRESS	SITE ADDRESS
1	036-00411-0000	RANDY D & KAREN M CRUME		E8284 SEAS BRANCH RD, VIROQUA, WI, 54665	
2	036-00393-0000	RANDY D & KAREN M CRUME		E8284 SEAS BRANCH RD, VIROQUA, WI, 54665	E8284 SEAS BRANCH RD
3	036-00410-0000	ALVIN L WOODMANSEE	C/O SUSAN WOODMANSEE	201 N WALBRIDGE AVE 111, MADISON, WI, 53714	
4	036-00408-0000	PAULINE A BUCKLAND		PO BOX 174, VIROQUA, WI, 54665	
5	036-00379-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
6	036-00381-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
7	036-00674-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
8	036-00638-0000	MADELINE CLEMENTS	STEVEN & DEBRA CLARK	210 N WASHINGTON, VIROQUA, WI, 54665	E8454 N ASBURY RD
9	036-00637-0000	WISCONSIN RSA #8	LIMITED PARTNERSHIP	8410 W BRYN MAWR AVE, CHICAGO, IL, 60631	
10	036-00635-0000	ZION CHURCH			
11	036-00645-0000	JEROME J & SHARON M BUTERA		E8449 N ASBURY RD, VIROQUA, WI, 54665	E8449 N ASBURY RD
12	036-00644-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
13	036-00642-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
14	036-00643-0000	JOHN & LINDA KIELER REVOCABLE TRUST		748 COUNTY RD Z, HAZEL GREEN, WI, 53811	
15	036-00641-0000	ROBERT J & TAMMY L MENNE		E8327 N ASBURY RD, VIROQUA, WI, 54665	E8327 N ASBURY RD
16	036-00652-0000	JOHN & LINDA KIELER REVOCABLE TRUST		748 COUNTY RD Z, HAZEL GREEN, WI, 53811	
17	036-00647-0000	CHAD B WILLIAMS		E7541 COUNTY RD SS, VIROQUA, WI, 54665	E8263 N ASBURY RD
18	036-00650-0000	JOHN & LINDA KIELER REVOCABLE TRUST		748 COUNTY RD Z, HAZEL GREEN, WI, 53811	
19	036-00649-0001	WAYNE K KRUIZENGA	JULIE KRUIZENGA	E8107 COUNTY RD LF, VIROQUA, WI, 54665	
20	036-00406-0000	ALICE MAE NELSON		E8137 COUNTY RD Y, VIROQUA, WI, 54665	
21	036-00405-0000	ALICE MAE NELSON		E8137 COUNTY RD Y, VIROQUA, WI, 54665	E8137 COUNTY ROAD Y
22	036-00404-0000	GRACE ACRES LLC		E8219 COUNTY RD Y, VIROQUA, WI, 54665	
23	036-00402-0000	GRACE ACRES LLC		E8219 COUNTY RD Y, VIROQUA, WI, 54665	E8219 COUNTY ROAD Y

Table 2
Locational Criteria and Performance Standard Summary

Locational/Performance Criteria	Wisconsin Administrative Code	Compliance (Y or N)	Remarks
Locational Criteria			
1,000 ft from any navigable lake, pond or flowage	NR 504.04(3)(a)	Y	Refer to Section 5.1.1
300 ft from any navigable river or stream	NR 504.04(3)(b)	Y	Refer to Section 5.1.2
Floodplain	NR 504.04(3)(c)	Y	Refer to Section 5.1.3
1,000 ft of the nearest R/O/W of any state trunk, interstate or federal aid highway or boundry of a public park unless the landfill is screened	NR 504.04(3)(d)	Y	Refer to Section 5.1.4
Airport Safety	NR 504.04(3)(e)	Y	Expansion of an existing landfill is exempt from the minumum setback requirements. (Refer to Section 5.1.5)
Within 1,200 ft of a private water supply well	NR 504.04(3)(f)	Y	Refer to Section 5.1.6
Within 200 ft. of a fault that has had displacement in Holocene time	NR 504.04(3)(g)	Y	Refer to Section 5.1.7
Within Seismic Impact Zones	NR 504.04(3)(h)	Y	Refer to Section 5.1.8
Within Unstable Areas	NR 504.04(3)(i)	Y	Refer to Section 5.1.9
Location Criteria Base Map	NR 504.04	Y	Refer to Figure 1 through Figure 5 and Section 4
Performance Standards			
A significant adverse impact on wetlands as provided for in NR 103	NR 504.04(4)(a)	Y	Refer to Section 5.2.1
A take of an endangered or threatened species	NR 504.04(4)(b)	Y	Refer to Sections 3 and 5.2.2
A detrimental effect on surface water	NR 504.04(4)(c)	ND	Pending design and maintenance of storm water management systems. (Refer to Section 5.2.3)
A detrimental effect on groundwater quality…	NR 504.04(4)(d)	ND	Pending landfill design and analysis of groundwater data in the feasibility report. (Refer to Section 5.2.4)
Migration and concentration of explosive gas…in excess of 25% of the LEL…	NR 504.04(4)(e)	ND	Pending landfill and landfill gas collection system design in the feasibility report. (Refer to Section 5.2.5)
Emissions of any hazardous air contaminants excess of 25% LEL.	NR 504.04(4)(f)	ND	Pending landfill and landfill gas collection system design in the feasibility report. (Refer to Section 5.2.6)

Notes:
Y= Yes
ND= Not Determined- Determination to be proviced in future submittals

Note: Figures 1 through 5 not included. Please refer to Appendix E of the ISR.

Figures

Figure 1 – Site Location
Figure 2 – Residential and Private Wells Within 1-Mile of Horizontal Expansion
Figure 3 – Floodplains and Water Features Within 1-Mile of Horizontal Expansion
Figure 4 – Topography Within 1-Mile of Horizontal Expansion
Figure 5 – Existing Land Use Within 1-Mile of Horizontal Expansion

Appendix A

ISI Request Checklist

LANDFILL INITIAL SITE INSPECTION REQUEST
COMPLETENESS CHECKLIST

SECTION NR 503.07, WISCONSIN ADMINISTRATIVE CODE – C&D AND ONE-TIME DISPOSAL LANDFILLS
SECTION NR 509.04, WISCONSIN ADMINISTRATIVE CODE – ALL OTHER LANDFILLS

Refer to Applicable Codes for Exact Requirements

General Information

Applicant:

Applicant Name: Vernon County Landfill

Contact/Title: Stacie Sanborn

Address: S3705 County Road LF, Viroqua, WI

Phone #: 608-634-2900

FID #: 6630308310

Site Location: South ½ of Section 15, T13N, R4W
Town of Viroqua, Vernon County, WI

Date of Initial Site Inspection Request: 09/03/2021

Consultant:

Consultant Name: SEH

Contact/Title: Brian Kent

Address: 329 Jay Street Suite 301, La Crosse, WI

Phone #: 608-498.4844

Date Project Entered into FIST System: _____

Date ISI is Due (Max. 22 bus. Days after receipt of request):

_____

Legal Note:
This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

GENERAL SUBMITTAL REQUIREMENTS - NR 503.07(2) or 509.04(2)	Y	N	NA	LOCATION	COMMENTS
1. Report sent to region and central office	x				see distribution list
2. Current standard technical procedures used and test methods specified – NR 500.05(5)			x		Not applicable
3. Visuals - NR 500.05(6)					
a. 8.5x11 to 32x44 inches in size	x				
b. Appropriate scale to show all required details with sufficient clarity	x				
c. Be numbered; referenced in the narrative; have a title, legend, horizontal and vertical scales; and drafting or origination dates	x				
d. Uniform scales	x				
e. North arrow	x				
f. Mean sea level as basis for all elevations	x				
g. Survey grid based on field monuments and utilizing a coordinate system acceptable to the department	x				
h. Original topography and grid system on plan sheets showing construction, operation or closure topography				x	
i. Cross-sections include survey grid location, reference to major plan sheets and reduced diagram of cross-section location plan view map				x	
3. Table of contents – NR 500.05(7)	x				
4. Appendix listing all references, raw data, testing and sampling procedures and calculations – NR 500.05(8)	x				

LANDFILL REQUEST MINIMUM REQUIREMENTS - NR 503.07(4) or 509.04(4)	Y	N	NA	LOCATION	COMMENTS
1. Cover Letter					
a. Applicant identified	x				Section 2.3
b. Authorized contact identified	x				Section 2.4
c. Current property owner identified	x				Section 2.3
d. Type of landfill being proposed	x				Section 2.1
e. Project location by ¼, ¼ section	x				Section 2.2
f. Present land use	x				Section 2.5
2. Known potential impacts to endangered and threatened species - NR 29	x				Section 3.1
3. Known potential impacts to historic, scientific or archeological areas, including prior studies or surveys, identified - s. 44.40, Wis. Stats.	x				Section 3.2
4. Enlarged 7.5 minute USGS map or equivalent (minimum 1"=500')					
a. Ground surface relief within one mile of project	x				Figure 1 and Figure 4
b. Surface water bodies within one mile of project	x				Figure 3
c. Floodplains within one mile of project	x				Figure 3
d. Existing land use within one mile of project	x				Figure 5
e. All water supply wells and residences within one mile of project	x				Figure 2
5. Preliminary identification of all potential conflicts with locational criteria and performance standards in: ● for C&D and one-time disposal landfills, NR 503.04 ● for all other landfills, NR 504.04 excluding NR 504.04(4)(d) to (f)	x				Sections 5.1 and 5.2

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Appendix B

ER/NHI Report

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg WI 53711-5397

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

August 31, 2021

Brian Kent
SEH
bkent@sehinc.com
608-498-4844

SUBJECT: RE: ER/NHI Review – Vernon County, Wisconsin
Vernon County Landfill v3

Dear Brian Kent:

Per your request, I have reviewed a parcel for potential ecological resources of concern and archaeological sites in Vernon County located in the S ½ of Section 15, Township 13 North, Range 4 West in the Town of Viroqua.

There are no concerns for ecological resources of concern within this reviewed parcel area. There were no elemental occurrences within the 2-mile buffer.

There are no concerns for archaeological or historical sites within this reviewed parcel.

Please include this letter and attachments with future permit submittals to the WDNR.

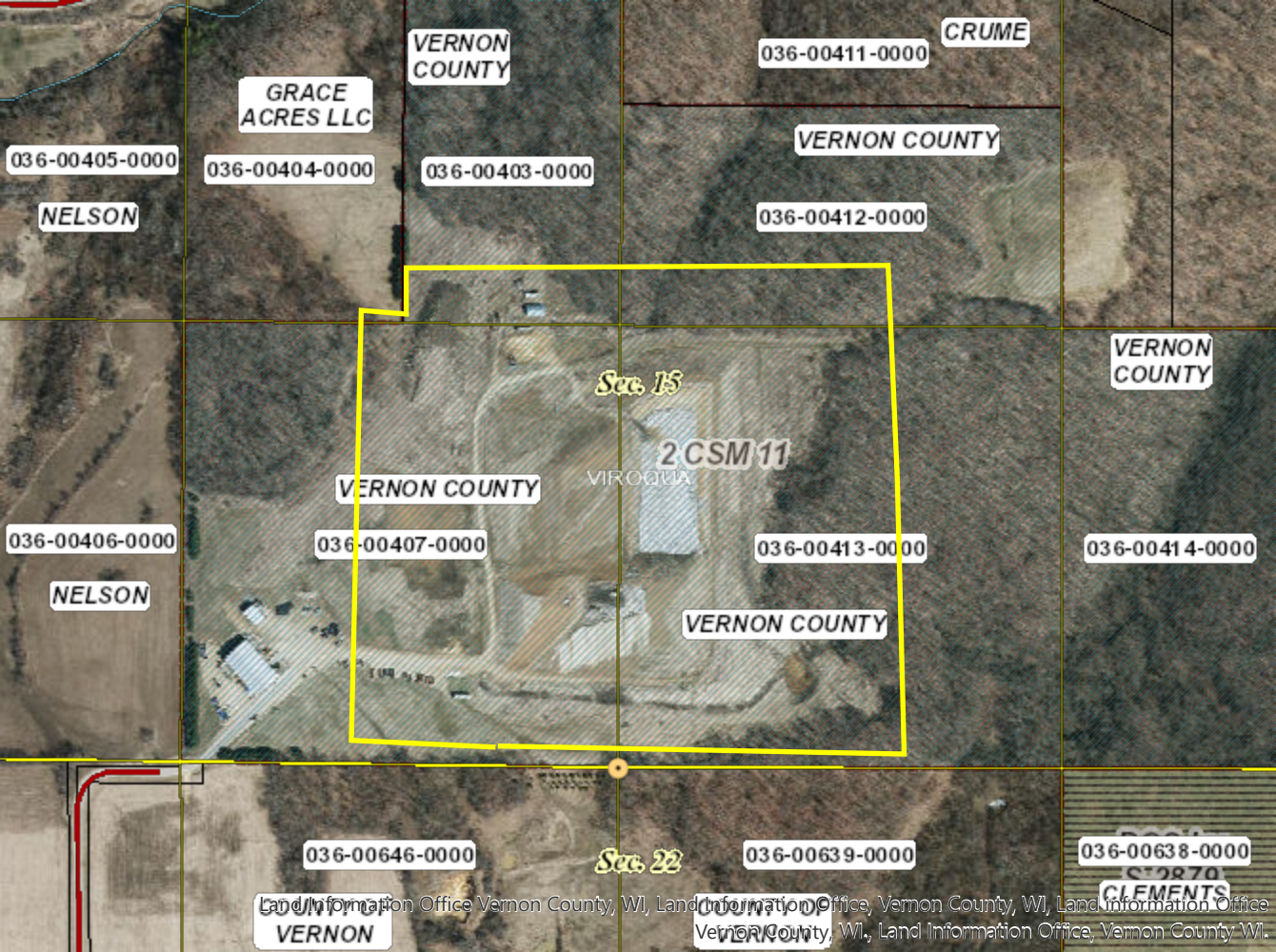
Sincerely,

Laura Spears

Laura Spears
Wastewater Specialist – Stormwater
South Central Region – Dodgeville Office

Attached: parcel location map, 2020 aerial image, NHI review

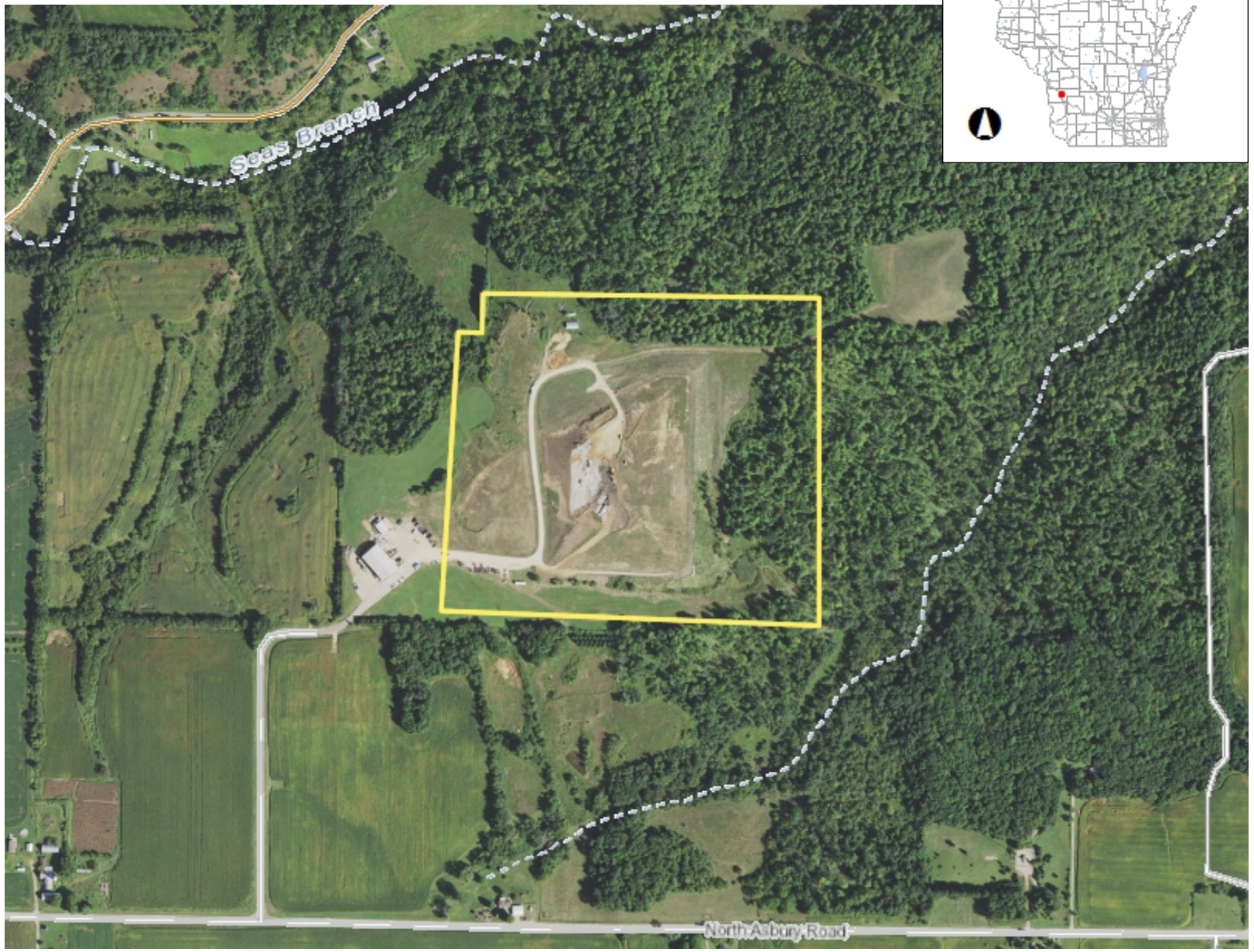
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Land Information Office Vernon County, WI, Land Information Office, Vernon County, WI, Land Information Office
Vernon County, WI., Land Information Office, Vernon County WI.

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Vernon County Landfill v3





Legend

- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

Notes

2020 Aerial

0.3 0 0.13 0.3 Miles

NAD_1983_HARN_Wisconsin_TM

1: 7,920

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/

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Endangered Resources Review for the Proposed Vernon County Landfill v3, Vernon County

Vernon County Landfill v3

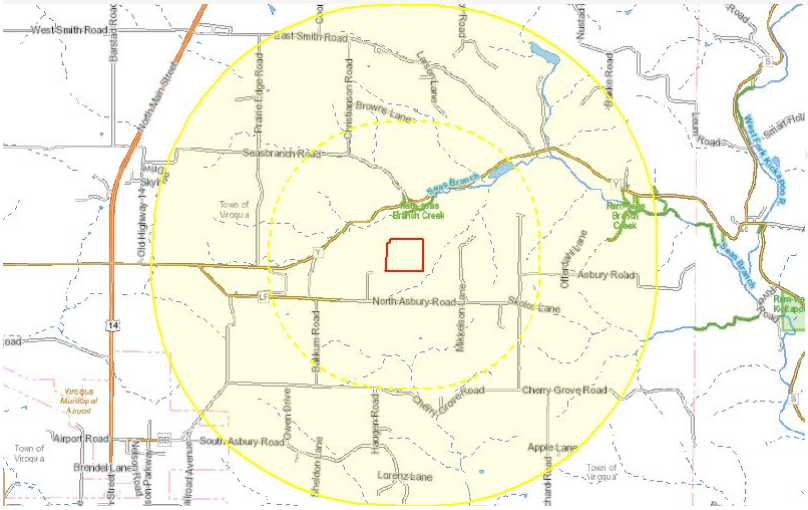
Reviewer Information

Reviewer Name	Laura Spears
Review Date	8/31/2021
Bureau / Org Name	Watershed Management
Work Station	Iowa

General Information

Project Title	Vernon County Landfill v3
Project No	
Federal Nexus	
Project Timing	
Property Type	

Map



Project Location

County	Vernon
PLSS Description	T13N R04W S15
Township Name	Viroqua
Ownership Type	
Landowner Name	

Project Information

Description	expanded area of the Vernon County Landfill
Habitat Description	expansion/improvements to existing landfill
Impacts to Wetlands and Waterbodies	
Additional DNR and Other Permits	

Element Occurrences

No element occurences exist in this area

Actions that need to be taken to comply with state and/or federal endangered species laws: **None**

Actions recommended to help conserve Wisconsin's Endangered Resources: **None**

Additional Recommendations: **None**

No actions are required or recommended for the following endangered resources: **None**

Disclaimer

This ER Review may contain Natural Heritage Inventory data (http://dnr.wi.gov/topic/NHI), including specific locations of endangered resources, which are considered sensitive and are not subject to Wisconsin's Open Records Law. As a result, information contained in this ER Review may be shared only with individuals or agencies that require this information in order to carry out specific roles in the permitting, planning and implementation of the proposed project. Specific locations of endangered resources may not be released or reproduced in any publicly disseminated documents.

Details related to project location, design, and timing of disturbance are important for determining both the endangered resources that may be impacted by the project and any necessary follow-up actions. If the project plans change, new details become available, or more than a year passed, please renew this review.

Confidential

Appendix C

FAA Correspondence

From: Beauchamp, Bobb (FAA)
To: Brian Kent
Subject: RE: Vernon County Landfill
Date: Friday, March 19, 2021 2:20:11 PM

Mr. Kent,

This email is responding to your October 23, 2020 notification of a proposed horizontal expansion at the Vernon County Landfill. Your notification was to meet provisions and requirements of:

- s. NR504.04(3)(e) Wisconsin Administrative Code
- 40 CFR 258.10 –Airport Safety
- 49 USC Section 44718(d), as amended by Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L No. 106-181 (April 5, 2000)
- FAA Advisory Circular AC No. 150/5200-34A (January 26, 2006) : Construction or Establishment of Landfills Near Public Airports
- FAA Advisory Circular AC No. 150/5200-33B (August 28, 2007) : Hazardous Wildlife Attractants On Or Near Airports

This e-mail of course only responds on behalf of the FAA and the Federal provisions shown above.

We concur with your conclusion that the provisions of 49 USC 44718(d) do not apply to this proposed expansion of the Vernon County Landfill. These provisions specifically do not apply to landfills that were constructed or in operation prior to April 5, 2000. The Vernon County Landfill was first constructed in 1993. In addition, the Viroqua Airport does not have regularly scheduled service in addition to general aviation operations, so the provisions of FAA AC 150/5200-34A, Construction or Establishment of Landfills Near Public Airports do also not apply.

Regarding the provisions of FAA Advisory Circular No 150/5200-33B, Hazardous Wildlife Attractants On Or Near Airports: The Landfill is outside the 10,000' area of primary concern identified in the AC. While FAA encourages the Landfill to continue its efforts under their Wildlife Hazard Management Plan, we recognize that FAA does not have regulatory or approval authority over the Landfill in this regard.

Based on the above, FAA has no objection to the proposed expansion at the Vernon County Landfill. Please feel free to contact me if you have any questions or additional concerns.

From: Brian Kent <bkent@sehinc.com>
Sent: Thursday, March 18, 2021 4:02 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: RE: Vernon County Landfill

Thank you

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
Building a Better World for All of Us®
Follow SEH on Twitter | Facebook | LinkedIn | Instagram

From: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Sent: Thursday, March 18, 2021 1:46 PM
To: Brian Kent <bkent@sehinc.com>
Subject: RE: Vernon County Landfill

Brian, I apologize for not getting back to you. I'll do my best to get you a more formal response by end of day tomorrow.

From: Brian Kent <bkent@sehinc.com>
Sent: Thursday, March 18, 2021 1:38 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: FW: Vernon County Landfill

Hi Bobb-
I apologize for my persistence but I am following up to check on the status of your response. Your response is needed as part of our permitting process and we are needing to get this to the WDNR in the very near future. Please reply at your earliest convenience. Thank you.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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From: Brian Kent
Sent: Tuesday, March 2, 2021 9:55 AM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: RE: Vernon County Landfill

Hi Bobb-
I hope all is well. Just following up with the below email correspondence. I have not received a formal response and wondering if it perhaps was misplaced? Thanks much.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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From: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Sent: Tuesday, December 29, 2020 3:08 PM
To: Brian Kent <bkent@sehinc.com>
Subject: RE: Vernon County Landfill

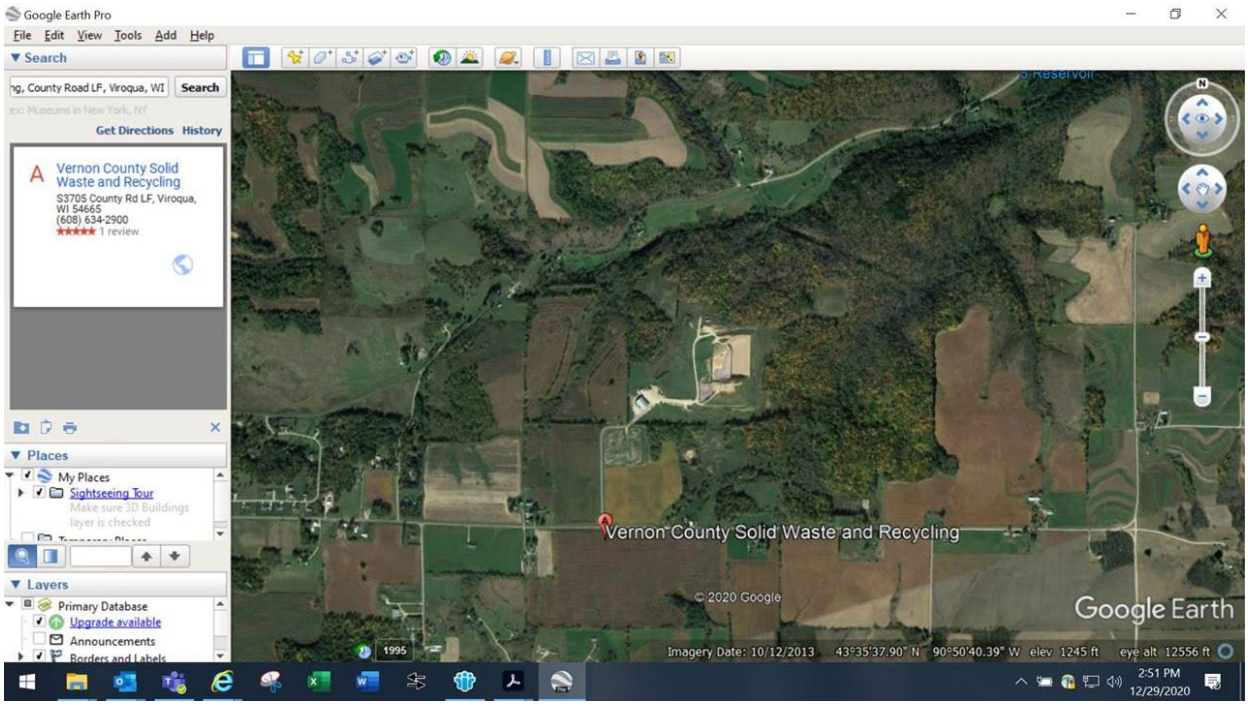
Great, that's the same facility I'm looking at.

Informally the expansion is exempt from 49 USC Section 44718(d) for 2 reasons: the expansion is of an existing landfill, and the Viroqua airport does not have regularly scheduled service in addition to general aviation. It's also outside the 10,000' area of primary concern put forth in FAA's Advisory Circular 150/5200-33B.

I'll work on a formal response email later this week.

From: Brian Kent <bkent@sehinc.com>
Sent: Tuesday, December 29, 2020 2:53 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: RE: Vernon County Landfill

Yes- below is a screen shot of what shows up for me.



Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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From: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Sent: Tuesday, December 29, 2020 2:14 PM
To: Brian Kent <bkent@sehinc.com>
Subject: RE: Vernon County Landfill

Hi Brian,

I'm also working remotely, and it's been impacting my normal ability to evaluate landfill requests such as this. Can you confirm that the facility identifies as Vernon County Solid Waste and Recycling on Google Earth?

From: Brian Kent <bkent@sehinc.com>
Sent: Tuesday, December 29, 2020 1:52 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: Vernon County Landfill

Bobb-
Attached is the letter SEH issued on October 23, 2020 providing notification of Vernon County's plan to expand their existing municipal waste landfill. I had not heard anything yet so I figured I better check on the status. Please feel free to contact me to discuss should you have any questions or issues. Please note I am working remotely due to COVID. If you prefer to call, please call my cell number at 715.456.4621. Also, if you already responded by mail it is possible that I have not received it yet since it takes a while to get my mail with our office being closed. Thanks in advance for your response.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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October 23, 2020

RE: Vernon County Landfill
Proposed Landfill Expansion (WDNR License No. 3268)
SEH No. VERSW 157634 14.00

FAA Airport Division
AGL - 600
2300 East Devon Avenue
Des Plaines, IL 60018

Dear Sir or Madam:

Short Elliott Hendrickson Inc. (SEH) is submitting this letter on behalf of Vernon County to notify the Federal Aviation Administration (FAA), and other concerned parties, of the County's proposed expansion of the Vernon County Landfill (WDNR License No. 3268). This notification is being provided to meet the provisions and requirements outlined in the following State and Federal Rules and guidance:

- s. NR504.04(3)(e) Wisconsin Administrative Code
- 40 CFR 258.10 –Airport Safety
- 49 USC Section 44718(d), as amended by Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L No. 106-181 (April 5, 2000)
- FAA Advisory Circular AC No. 150/5200-34A (January 26, 2006) : Construction or Establishment of Landfills Near Public Airports
- FAA Advisory Circular AC No. 150/5200-33B (August 28, 2007) : Hazardous Wildlife Attractants On Or Near Airports

The proposed Vernon County Landfill Expansion (Landfill Expansion) is located in the Southern Half of Section 12, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin. The proposed horizontal landfill expansion encompasses approximately 10-acres due west and north and contiguous to the current permitted landfill. As shown the Attached Figure 1, "Site Location" the landfill expansion is located approximately 2.8 miles northeast of the closest runway at the Viroqua Municipal Airport and the existing landfill and expansion are not located in the approach or departure path for the airport.

The limitations of 49 USC Section 44718(d) apply to new municipal solid waste landfills (MSWLF's), which are defined as a municipal waste landfill that was established or constructed after April 5, 2000. Additionally, FAA Advisory Circular AC No. 150/5200-34A states that 49 USC Section 44718(d) does not apply to the expansion or modification of an existing MSWLF. The current active Vernon County Landfill was first constructed in 1993, therefore exempt from the limitations of 49 USC Section 44718(d).

As part of the last expansion process, Vernon County issued a letter to the FAA on May 29, 2002 notifying interested parties of their intention to expand. In a letter dated June 16, 2002 the FAA responded with a letter concurring with the proposal relative to compatibility standards contained in FAA Advisory Circular AC No. 150/5200-33, with the following conditions:

1. The landfill facility must be properly supervised to assure that the bird populations are not increasing and that appropriate control procedures are being followed.
2. Any increases in bird activity that might be hazardous to safe aircraft operations will result in prompt mitigation actions and/or closure of the landfill
3. The above conditions must be clearly defined via State/Local licensing procedures associated with establishment of the landfill.
4. The landfill owner/operator should develop and implement a Wildlife Hazard Management Plan for operation of the landfill.

A Wildlife Hazard Management Plan (Plan) was included in their Plan of Operation, which has been approved by the WDNR and part of the facility operating record. The Plan utilizes the following strategies:

- Minimization of standing water areas
- Minimization of uncovered waste areas
- Prompt revegetation of disturbed areas outside of the waste footprint
- Utilization of bird harassment techniques, perch deterrents, and avoidance structures, as needed

We understand that the FAA does not approve or disapprove of solid waste landfill locations but is primarily concerned about location relative to safety. We request that you review this letter and attachments and reply with your assessment of the proposed landfill expansion. Please contact me at 608.498.4844 with any questions or concerns.

Sincerely,

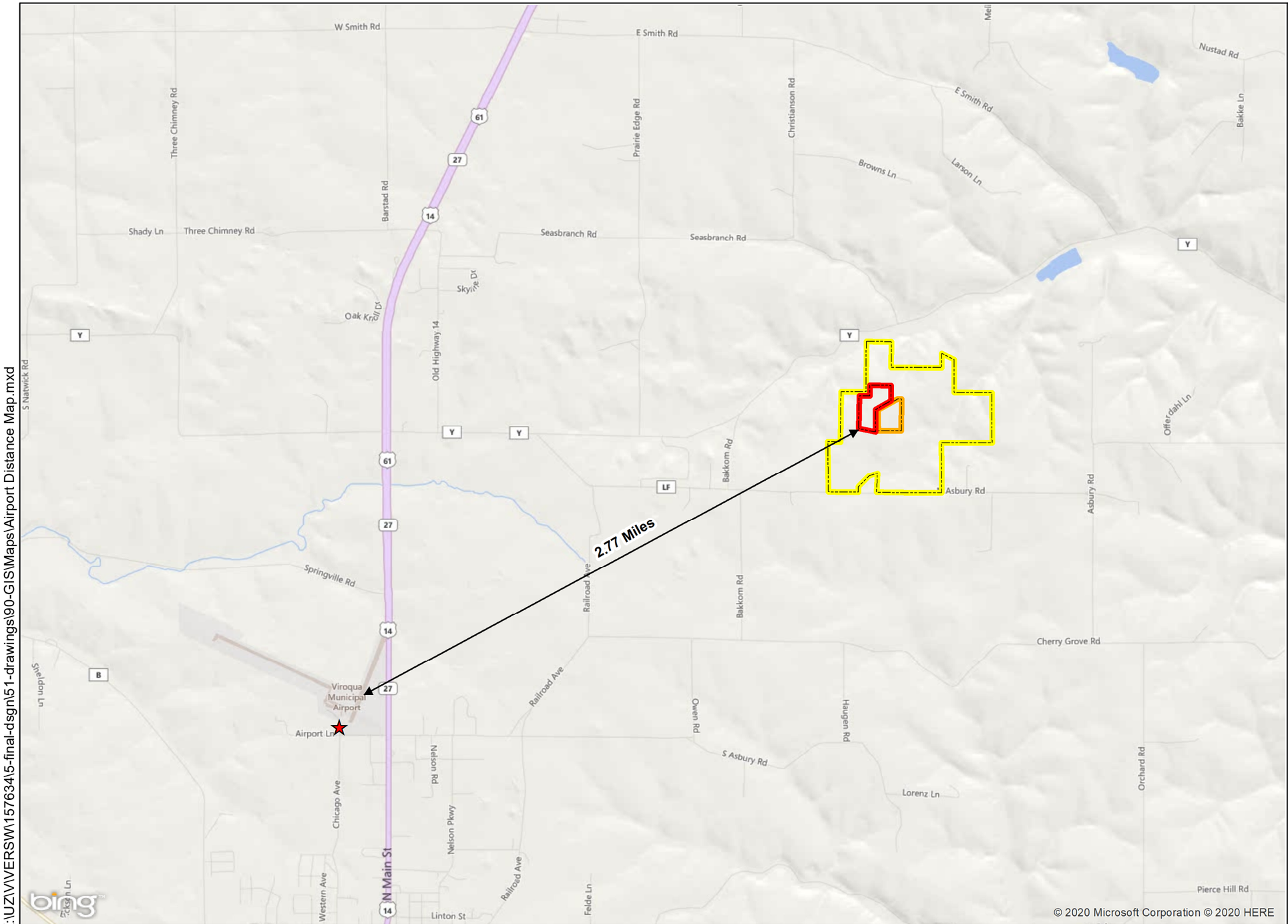
SHORT ELLIOTT HENDRICKSON INC.



Brian L. Kent, CHMM
Project Manager

BLK
Attachment
c: Stacie Sanborn, Vernon County Solid Waste (electronic)
Stacey Miller, Wisconsin DOT, Bureau of Aeronautics
Michael Skildum, Viroqua Municipal Airport Manager
Darryl R. Heaps, SEH (electronic)

x:\uz\v\versw\157634\3-env-stdy-regs\isi_isr\faa_airport\versw_faa notification letter 10.23.2020.docx



Legend

- Landfill Property Boundary
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Landfill Expansion

N
W E
S

0 0.25 0.5 1 Miles

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
rjh

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. If errors or discrepancies are found please contact SEH GIS Services. This user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.

Document Path: X:\UZ\V\VERSW\157634\5-final-dsgn\51-drawings\90-GIS\Maps\Airport Distance Map.mxd

SEH
10 North Bridge Street
Chippewa Falls, WI 54729
PHONE: (715) 720-6200
FAX: (715) 720-6300
WATTS: 800-472-5881
www.sehinc.com

PROJECT: VERSW157634

DATE: 10/20/2020

ISI REQUEST
VERNON COUNTY LANDFILL
(WIDNR LICENSE NO.3268)

Distance to Viroqua Municipal Airport

Figure 1

Appendix D

USGS Maps

U.S. Geological Survey Quaternary Faults



5/6/2019 2:30:33 PM

Quaternary faults

- unspecified age, well constrained location
- unspecified age, moderately constrained location
- unspecified age, inferred location
- undifferentiated Quaternary (< 130,000 years), well constrained location
- undifferentiated Quaternary (< 130,000 years), moderately constrained location
- undifferentiated Quaternary (< 130,000 years), inferred location
- middle and late Quaternary (< 1.6 million years), well constrained location
- middle and late Quaternary (< 1.6 million years), moderately constrained location
- middle and late Quaternary (< 1.6 million years), inferred location
- latest Quaternary (<15,000 years), well constrained location

1:18,489,298

0 175 350 700 mi

0 270 540 1,080 km

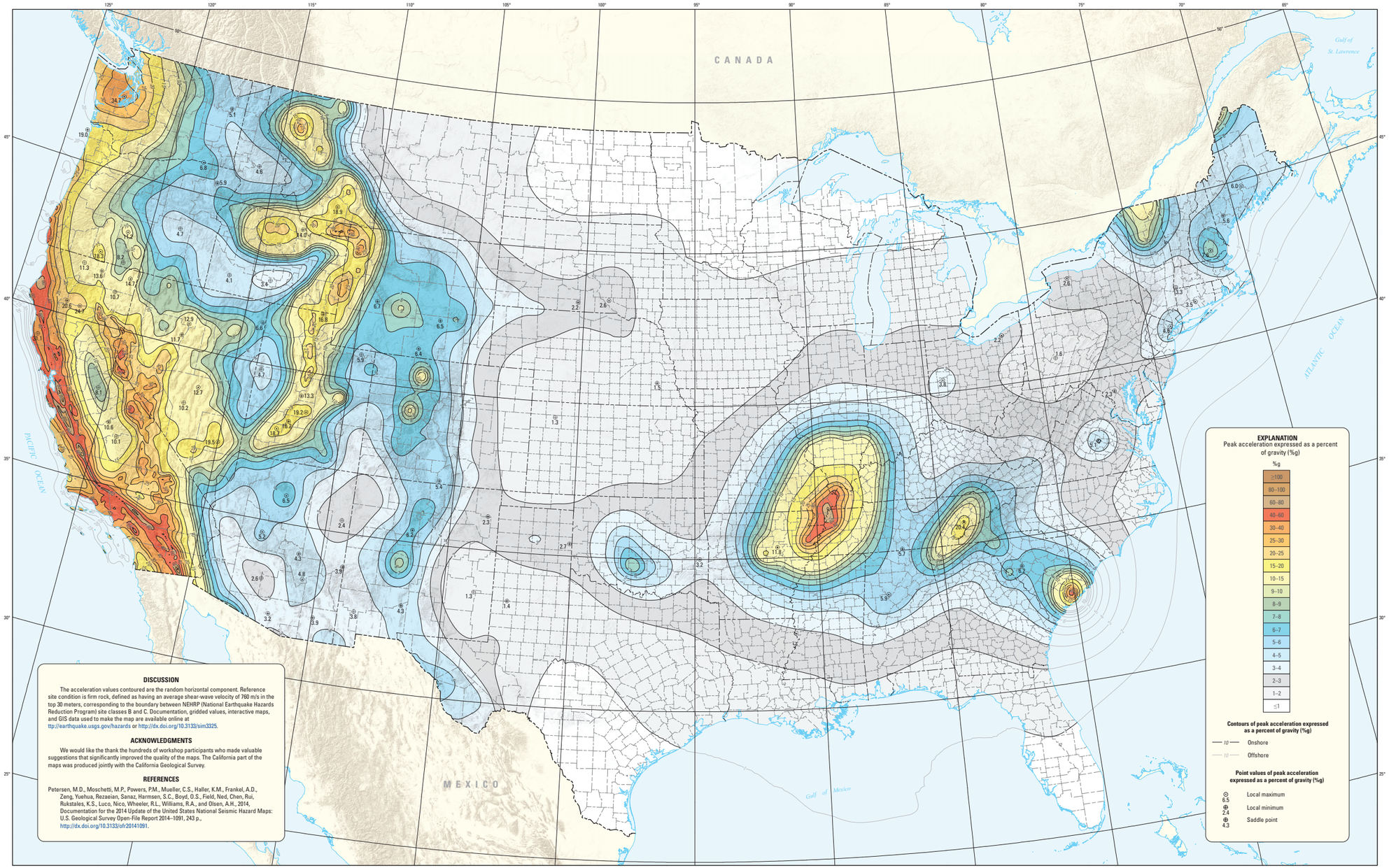
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U.S. Geological Survey

Scientific Investigations Map 3325
Sheet 1 of 6



DISCUSSION

The acceleration values contoured are the random horizontal component. Reference site condition is firm rock, defined as having an average shear-wave velocity of 760 m/s in the top 30 meters, corresponding to the boundary between NEHRP (National Earthquake Hazards Reduction Program) site classes B and C. Documentation, gridded values, interactive maps, and GIS data used to make the map are available online at ftp://earthquake.usgs.gov/hazards or http://dx.doi.org/10.3133/sim3325.

ACKNOWLEDGMENTS

We would like the thank the hundreds of workshop participants who made valuable suggestions that significantly improved the quality of the maps. The California part of the maps was produced jointly with the California Geological Survey.

REFERENCES

Petersen, M.D., Moschetti, M.P., Powers, P.M., Mueller, C.S., Haller, K.M., Frankel, A.D., Zeng, Yuehua, Rezaeian, Sanaz, Harmsen, S.C., Boyd, O.S., Field, Ned, Chen, Rui, Rukstales, K.S., Luco, Nico, Wheeler, R.L., Williams, R.A., and Olsen, A.H., 2014, Documentation for the 2014 Update of the United States National Seismic Hazard Maps: U.S. Geological Survey Open-File Report 2014–1091, 243 p., http://dx.doi.org/10.3133/ofr20141091.

SCALE 1:7 000 000

100 0 100 200 300 400 500 600 700 800 900 1000 MILES

100 0 100 200 300 400 500 600 700 800 900 1000 KILOMETERS

Digital data prepared with ArcGIS 10.1 running under Windows 7

Shaded relief base from Esri Inc., 2008, Data and Maps
All other base map data from Esri Inc., 1993, Digital Chart of the World
United States County base map from the U.S. Geological Survey National Atlas, available at http://nationalatlas.gov/

Projection: Albers equal-area conic
Standard parallels 29.5°N. and 45.5°N., central meridian 95°W

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Box 25046, Mail Stop 966
Denver, CO 80225
(303) 273-8579
Or visit the Geologic Hazards Science Center Web site at:
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Seismic-Hazard Maps for the Conterminous United States, 2014

Peak Horizontal Acceleration with 10 Percent Probability of Exceedance in 50 Years

By

Mark D. Petersen,[1] Morgan P. Moschetti,[1] Peter M. Powers,[1] Charles S. Mueller,[1] Kathleen M. Haller,[1]Arthur D. Frankel,[1] Yuehua Zeng,[1] Sanaz Rezaeian,[1] Stephen C. Harmsen,[1] Oliver S. Boyd,[1] Edward H. Field,[1] Rui Chen,[2] Nicolas Luco,[1]Russell L. Wheeler,[1] Robert A. Williams,[1] Anna H. Olsen,[1] and Kenneth S. Rukstales[1]

2015

[1]U.S. Geological Survey
[2]California Geological Survey, Sacramento, Calif.

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Toll Free 1-888-936-7463
TTY Access via relay - 711

December 15, 2020

File Ref: FID 663038310
Vernon County
SW/CORR

Ms. Stacie Sanborn
Vernon County Landfill
Route 3, Box 247 B
Viroqua, WI 54665

Subject: Initial Site Inspection Response - Proposed Expansion to Vernon County Landfill, License #3268

Dear Ms. Sanborn:

This letter documents the initial site inspection (ISI) performed by the Department of Natural Resources (department) on November 18, 2020, for the proposed expansion of the Vernon County Landfill. Waste Management Engineer Martin Herrick and Hydrogeologist Carolyn Cooper conducted the inspection. The purpose of the inspection was to identify any potential conflicts the proposed expansion might have with the location and performance standards in s. NR 504.04, Wis. Adm. Code.

As part of the inspection, the department evaluated the information in Short Elliot Hendrickson (SEH)'s November 4, 2020 ISI request letter submitted on behalf of Vernon County. The ISI request letter states that the proposed expansion is in the South ½ of Section 15, T13N, R4W. Please review this description for accuracy and provide future site location descriptions to the ¼-¼ Section level.

According to the ISI letter, the proposed expansion consists of a contiguous 10-acre horizontal expansion to the west and north of Phase 1 of the currently permitted active MSW landfill (License #3268) and a vertical expansion over the western portions of the active landfill. As observed during the ISI, the horizontal expansion area consists of open, grassy areas adjacent to the existing active landfill with wooded areas farther to the north and northeast. The area of the proposed horizontal expansion includes the current leachate loadout area, access roads to the active landfill and the closed construction and demolition waste (C&D) landfill, a wooden shed, and a soil stockpile area. Any impacts or changes to these existing features would be described in the Initial Site Report (ISR) and feasibility report.

Based on the review of the documents included with the November 4, 2020 ISI request and observations from the site inspection, the department's preliminary opinion regarding the suitability of site location is that the site location has potential. The only conflict with the locational criteria contained in s. NR 504.04 (3), Wis. Adm. Code, that was identified is a water supply well located within 1,200 feet of the proposed expansion boundary or the currently approved waste limits. Regarding the performance standards contained in s. NR 504.04 (4), Wis. Adm. Code, the department's review of the Surface Water Data Viewer (SWDV) shows a location within the proposed project area that has wetland indicators that would need to be checked by an assured wetland delineator. If there are conflicts that cannot be satisfactorily addressed in accordance with applicable requirements, then they would be constraints to site development.

Summary of Locational Criteria: As described in s. NR 504.04(3)(a) to (i), Wis. Adm. Code, there are several locational criteria that apply to the proposed landfill expansion. The proposed limits of filling may not be located within:

(a) *1,000 feet of any navigable lake, pond or flowage.* The ISI request states that there is not a navigable lake, pond, or flowage within 1,000 feet of the proposed expansion; however, there is an existing manmade stormwater detention pond within 1,000 feet of the proposed expansion, southeast of the active landfill. As a sedimentation control structure, this pond would be excluded from this setback requirement.

(b) *300 feet of any navigable river or stream*. According to the ISI request, the proposed expansion is not within 300 feet of a navigable river or stream. The department's SWDV also indicates the proposed expansion is not within 300 feet of a navigable river or stream.

(c) *A floodplain*. According to the ISI request, the proposed expansion is not within a floodplain. The department's SWDV also indicates this area is not in a floodplain.

(d) *1,000 feet of the nearest edge of the right-of-way of any state trunk highway, interstate or federal aid primary highway or the boundary of any public park or state natural area, unless the landfill is screened.* According to the ISI request there are no state trunk highways, interstate or federal aid primary highways within 1,000 feet of the proposed site. US Highway 14/61 and State Highway 27 are the closest features and will be over 12,500 feet from the proposed site. The ISI request states that there are no public parks or state natural areas within 1,000 feet of the limits of the current landfill or expansion footprint.

(e) *An area where the design or operation of the landfill would pose a significant bird hazard to aircraft.* According to the ISI request, there are no airport runways within 10,000 feet of the proposed landfill expansion. The closest runway at the Viroqua Airport is located approximately 15,800 feet (2.7 miles) southwest of the proposed landfill expansion, and the landfill is not located in the approach or departure path for the airport. Because the proposed expansion is within 5 miles of this runway, notification to the Federal Aviation Administration (FAA) is required. The ISI request included a copy of the October 23, 2020 notification made by SEH to the FAA on behalf of Vernon County. Section NR 509.06 (3), Wis. Adm. Code requires inclusion of the initial response letter from the FAA in the ISR.

(f) *1,200 feet of any public or private water supply well*. The ISI request states that no public or private wells are located within 1,200 feet of the proposed expansion boundary, except for the well serving the landfill office and recycling facility (WUWN FU046). The ISI request states that a ch. NR 812, Wis. Adm. Code variance for the setback requirement for this well was granted prior to constructing the initial landfill cell. If Vernon County pursues expansion of the landfill within the 1,200-foot setback zone, please request and justify an exemption to this locational criterion or provide an alternative water supply for this property. If the proposed limits of waste would extend closer to the well than currently approved or be located in a different gradient position with respect to groundwater flow from the water supply well, then a new NR 812 well variance application may be required. Further discussion regarding public and private wells in the area would be addressed in the feasibility report.

(g) *200 feet of a fault that has had displacement in Holocene time*. The ISI request states that the proposed expansion is not within 200 feet of a fault that has had displacement since Holocene time. Further discussion regarding the geologic stability of the area would be addressed in the feasibility report.

(h) *Seismic impact zone*. The ISI request concludes that the site is in an area of very low seismic hazard based on United States Geological Survey (USGS) information.

(i) *Unstable areas*. The ISI request states there is no evidence of unstable conditions at the site based on known current or historical data. Further discussion regarding the geologic stability of the area would be addressed in the feasibility report.

It appears that the site meets or could be constructed and operated to meet the performance standards in s. NR 504.04 (4), Wis. Adm. Code.

(a) Wetland Areas - Based on information provided in the ISI request, review of the SWDV and the site inspection, no regulated wetlands were identified within the proposed project area at this time. However, the SWDV identified a location within the proposed expansion area as a potential wetland indicator based on soil type and/or wet area. Please see the attached map. Vernon County should have this area checked by an assured wetland delineator and provide the findings in the ISR.

(b) Critical Habitat Areas - Based on a review of the Natural Heritage Inventory (NHI), no element occurrences were identified as existing in the area. Therefore, it appears unlikely that there would be any significant adverse impact on critical habitat areas or endangered or threatened species due to the proposed expansion. As the proposed project progresses through the siting process, additional reviews by department staff may be done at different stages to update the NHI review.

Archaeological issues and historical structures for the proposed expansion area were cleared by Richard Kubicek, Departmental Archaeologist/Departmental Historic Preservation Officer, on November 10, 2020.

The performance criteria outlined in s. NR 504.04 (4) (c) through (f), Wis. Adm. Code include evaluation of surface water, groundwater, gas migration and air contaminant impacts. These performance criteria would be evaluated during the department's review of a feasibility report for the proposed expansion.

Please note that s. NR 504.04 (4) (d), Wis. Adm. Code, requires submittal of a 7.5 Minute USGS map or equivalent with a scale of 1 inch=500 feet. The ISI request included a 1 inch=2000 feet scale topographic map; however, a 1 inch=500 feet scale map will be required in the ISR submittal. Several maps at this scale may be needed to show all of the items listed in this code section, which include the depiction of contour intervals to sufficiently show relief, surface waters, floodplains, existing land use conditions including the location of public parks, and all water supply wells and residences located within one mile of the property boundaries of the proposed landfill.

Please remember that s. NR 504.09 (2) (f), Wis. Adm. Code, requires a minimum separation distance of 100 feet be maintained between the limits of filling and the adjacent property line. A minimum distance of 50 feet must be maintained between any permanent berms or excavations associated with the landfill, excluding stormwater diversion structures, and the adjacent property line.

The locational and performance criteria will be evaluated again as the department reviews the ISR and feasibility report. Please keep in mind that as the department continues its review of the proposed expansion and as new information is presented, additional questions or concerns may arise, or requests for further information may be made before a feasibility determination is made.

Please do not hesitate to contact me at 608-275-7779 or by email at carolyn.cooper@wisconsin.gov if you have any questions about this letter.

Sincerely,



Carolyn Cooper, P.G.
Hydrogeologist
South Central Region

cc: Martin Herrick - DNR - WCR
John Morris - DNR - WCR
Cynthia Moore - DNR - SCR
Joe Lourigan - DNR - Madison, WA/5
Valerie Joosten - DNR - WA
Brian Kent - SEH
Darryl Heaps - SEH

Initial Site Inspection Request

Vernon County Landfill

Viroqua, Wisconsin

WDNR License No. 3268

VERSW 157634 | November 4, 2020

SEH

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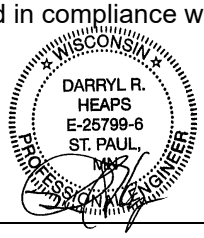
Initial Site Inspection Request

Vernon County Landfill
Viroqua, Wisconsin

Prepared for:
Vernon County Solid Waste
Viroqua, Wisconsin

Prepared by:
Short Elliott Hendrickson Inc.
329 Jay Street, Suite 301
La Crosse, WI 54601-4034
608.782.3161

I, Darryl R. Heaps, hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.



Darryl R. Heaps, PE, CHMM Environmental Scientist	E-25799 PE Number	11.4.2020 Date

Brian L. Kent CHMM Project Manager	11.4.2020 Date

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Distribution

No. of Copies	Sent to
1	Marty Herrick, PE Waste Management Engineer Wisconsin Department of Natural Resources 3050 Mormon Coulee Road La Crosse, WI 54601
1	Stacie Sanborn Director of Solid Waste Vernon County Solid Waste Department S3705 County Road LF Viroqua, WI 54665
1	WDNR - Bureau of Waste Management 101 S. Webster Street PO Box 7921 Madison, WI 53707
1	Carolyn Cooper, PG Hydrogeologist Wisconsin Department of Natural Resources 3911 Fish Hatchery Road Fitchburg, WI 53711
1	Darryl Heaps, PE SEH 3535 Vadnais Center Drive St. Paul, MN 55110

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Initial Site Inspection Request

Vernon County Landfill

Prepared for Vernon County Solid Waste

1 Introduction

1.1 Purpose

The Vernon County Landfill (WDNR License No. 3268) proposes to expand the existing landfill for disposal of municipal solid waste, commercial and industrial waste. Short Elliott Hendrickson Inc. (SEH®), on behalf of Vernon County (County), is issuing this report to request an initial site inspection (ISI) for the purpose of evaluating compliance with the applicable locational criteria and performance standards specified under s. NR504.04 Wisconsin Administrative Code.

1.2 Landfill Initial Site Inspection Checklist

Appendix A, "ISI Request Checklist" includes a completed Landfill Initial Site Inspection Request Completeness Checklist (WA1184). The checklist was utilized by SEH to confirm correct and sufficient data is provided to the WDNR in accordance with s. NR509.04 Wisconsin Administrative Code, and as a quick reference guide to the WDNR reviewer for location of applicable information contained in this report.

2 General Information

The Vernon County Solid Waste Department owns and operates an integrated waste management system on approximately 250-acres located in the Town of Viroqua, Wisconsin. The integrated waste management system includes:

- An approximate 10-acre municipal solid waste landfill, with an approximate design capacity of 590,000 cubic yards (WDNR License No. 3268)
- A closed small sized (50,000 cubic yard) C&D Landfill (WDNR License No. 3712)
- A recyclable material processing and baling facility

2.1 Proposed Operation

The County is proposing to permit a horizontal and vertical expansion for the municipal waste landfill (WDNR License No. 3268). The approximate waste footprint for the proposed expansion is shown on the attached Figure 1 through Figure 5. Please note that the approximate footprint presented is not anticipated to cover the entire area shown, but bounds the areas currently being considered for the expansion. It is anticipated that the proposed expansion footprint will be less than 10-acres. The landfill will continue to accept waste from regional haulers and municipalities located in Vernon County. The proposed expansion is described as following:

- Horizontal expansion of approximately 10-acres west and north of Phase 1 of the existing active landfill

- Vertical expansion over the western portions of the existing active landfill (License No. 3268)

2.2 Location

The current landfill, and proposed expansion is located in the South half of Section 15, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin. The physical address for the Solid Waste Department is S3705 County Road LF, Viroqua, Wisconsin.

2.3 Owner/Applicant

The Owner and Applicant are as follows:

Vernon County Solid Waste Department
C/O Stacie Sanborn, Solid Waste Director
S3705 County Road LF
Viroqua, WI 546665

2.4 Authorized Contacts

Authorized contacts are as follows:

OWNER
Stacie Sanborn, Solid Waste Director
Vernon County Solid Waste Department
S3705 County Road LF
Viroqua, WI 546665
608.634.2900

CONSULTANT
Brian L. Kent, CHMM
SEH
329 Jay Street, Suite 301
La Crosse, WI 54601
608.498.4844

2.5 Present Land Use

Presently the property is utilized for active solid waste disposal relating to the active landfill cell. The property also includes a closed small sized C&D landfill located northeast of the active MSW landfill. Several buildings are located near the entrance to the property which serve as the scale house, landfill office space, and accommodate the recycling processing operations.

The approximate 10-acres for the proposed horizontal expansion are currently vegetated, but vacant and undeveloped. Portions of the area currently contain soil stockpiles for use in day to day landfill operations.

3 Endangered and Archeological Resources {NR509.04(4)(b)}

3.1 Endangered Resources

The Wisconsin Department of Natural Resources (WDNR) has conducted a review of the area for occurrences of Endangered, Threatened, or Special Concern Species, natural communities, or State Natural Areas in accordance with Wis. Stat. §26.604(4). Per WDNR review and subsequent letter, there are no record of the above occurrences that would be impacted by the proposed project.

A copy of the recent endangered resource report from the WDNR is provide in Appendix B, "ER/NHI Report" for your review

3.2 Archeologic Resources

As required by Wis. Stat. §44.40, the WDNR performed a review of the area to determine if any known historic, scientific, or archeological areas exists within the vicinity of the proposed facility. As indicated in the attached letter from the WDNR, the review indicates no archeological or historical findings within the proposed landfill property and proposed development site.

A copy of the letter from the WDNR is provided in Appendix B for your review.

4 Base Maps {NR509.04(4)(d)}

Attached Figure 1 through Figure 5 are base maps generated from data provided by the Vernon County Land Information Department and the USGS Avalanche quadrangle maps. Following is a summary of the attached figures relating to the required information.

- Figure 1 - Site Location: Provides location, topography/relief, and surface waters other than man-made storm water basins on the landfill property.
- Figure 2 - Residential and Private Wells Within 1-Mile of Horizontal Expansion: Includes an aerial photograph depicting residences, private wells and landowners within 1-mile of the landfill property. The attached Table 1, "Adjacent Property Owners" provides a listing of each of the landowners and/or residences located within 1,200 feet of the landfill footprint or contiguous to the landfill property.
- Figure 3 - Floodplains and Water Features Within 1-Mile of Horizontal Expansion: Identifies flood hazard areas and surface water bodies within 1-mile of the landfill property.
- Figure 4 - Topography Within 1-Mile of Horizontal Expansion: Provides topography for vicinity within 1-mile of the landfill property. The topography data was provided by the Vernon County Land Information Department and is more current that the USGS map provided on Figure 1.
- Figure 5 - Existing Land Use Within 1-Mile of Horizontal Expansion: Identifies the current land use and category for areas within 1-mile of the landfill property.

5 Potential Conflicts

Following is a summary of the locational and performance standards specified in s. NR 504.04 Wisconsin Administrative Code, and the compliance status of the proposed expansion relative to the requirements. The attached Table 2, “Locational Criteria and Performance Standard Summary” provides a summary of status of compliance with the locational and performance standards.

5.1 Locational Criteria

As discussed, following, the preliminary review of the locational standard requirements for the proposed horizontal and vertical expansion do not indicate any potential conflicts.

5.1.1 Navigable Lake, Pond or Flowage {s. NR504.04(3)(a)}

The proposed expansion will not be located within 1,000 feet of a navigable lake, pond or flowage. One sedimentation basin is located within the 1000-foot setback requirement; however, the rule excludes landfill drainage or sedimentation control structures from the setback requirement. The closest water body to the existing landfill and proposed expansion is the Seas Branch Pond located greater than 4,000 feet to the northeast. According to the WDNR’s Surface Water Data Viewer database, the Seas Branch pond is an approximate 11-acre flood control impoundment with poor water quality.

5.1.2 Navigable River or Stream {s. NR504.04(3)(b)}

The proposed expansion will not be located within 300 feet of a navigable river or stream. The closed navigable river or stream is the Seas Branch Stream located approximately 1,500 feet north of the current landfill footprint. Additionally, an unnamed intermittent stream is located approximately 1,000 feet to the east of the existing landfill footprint. The intermittent stream appears to originate on the landfill property and heads northeast towards the Seas Branch Pond.

5.1.3 Floodplain {s. NR504.04(3)(c)}

As shown on Figure 3, the current landfill and proposed expansion footprint are not located in a flood hazard area or floodplain. The closest flood plain to the landfill footprint is located approximately 2,000 feet to the north in the Seas Brand Valley, which is significantly lower in elevation that the proposed landfill footprint

5.1.4 State/Federal Highways, Public Park and Natural Areas {s. NR504.04(3)(d}

The existing landfill and proposed horizontal expansion are located greater than 1,000 feet from any State/Federal Highway, public park or natural area. The existing landfill and proposed horizontal expansion are located greater than 12,500 feet east of the right-of-way for US Highway 14/61 and State Highway 27. As indicated on Figure 5, there are no public parks or State natural areas within 1,000 feet of the limits of current landfill or expansion footprint.

5.1.5 Airport Safety {s. NR504.04(3)(e)}

The proposed landfill expansion is located approximately 2.7 miles (>15,840 feet) northeast of the closest runway at the Viroqua Airport and is not located in the approach or departure path for

the airport. Since the expansion is located less than 5 miles from the airport, the County has issued a letter dated October 23, 2020 to the Federal Aviation Administration (FAA) notifying them of their intent to expand. A copy of the notification letter is attached in Appendix C, “FAA Correspondence.”

Review of applicable regulations regarding landfill siting and expansions near airports indicate that the requirements of 49 USC Section 44718(d) apply only to new municipal solid waste landfills (MSWLF’s), which are defined as a municipal waste landfill that was established or constructed after April 5, 2000. Furthermore, FAA Advisory Circular AC No. 150/5200-34A states that 49 USC Section 44718(d) does not apply to the expansion or modification of an existing MSWLF. The current active Vernon County Landfill was first constructed in 1993, therefore exempt from the limitations of 49 USC Section 44718(d).

As part of the last expansion process, Vernon County issued a letter to the FAA on May 29, 2002 notifying interested parties of their intention to expand. In a letter dated June 16, 2002 the FAA responded with a letter concurring with the proposal relative to compatibility standards contained in FAA Advisory Circular AC No. 150/5200-33, with the following conditions:

1. The landfill facility must be properly supervised to assure that the bird populations are not increasing and that appropriate control procedures are being followed.
2. Any increases in bird activity that might be hazardous to safe aircraft operations will result in prompt mitigation actions and/or closure of the landfill
3. The above conditions must be clearly defined via State/Local licensing procedures associated with establishment of the landfill.
4. The landfill owner/operator should develop and implement a Wildlife Hazard Management Plan for operation of the landfill.

A Wildlife Hazard Management Plan (Plan) was included in their Plan of Operation, which has been approved by the WDNR and part of the facility operating record. The Plan utilizes the following strategies:

- Minimization of standing water areas
- Minimization of uncovered waste areas
- Prompt revegetation of disturbed areas outside of the waste footprint
- Utilization of bird harassment techniques, perch deterrents, and avoidance structures, as needed

The FAA does not approve or disapprove of solid waste landfill locations but is primarily concerned about location relative to safety. With issuance of the attached notification letter, it is anticipated that the FAA may reply with additional conditional actions to address safety concerns.

5.1.6 Public & Private Wells {s. NR504.04(3)(f)}

As shown on Figure 2, there are no public or private wells located within 1,200 feet of the existing or proposed expansion landfill footprint except for the well serving the landfill office and recycling facility. A variance for the setback requirement for the recycling facility private well was issued to the County prior to constructing the initial landfill cell.

5.1.7 Halocene Era Faults {s. NR504.04(3)(g)}

According to the U.S Geographic Survey (USGS) Earthquake Hazards Program Interactive Fault Map, there are no faults within the vicinity of the active or proposed expansion footprint.

Appendix D, “USGS Maps” includes a map from the interactive mapping system showing known faults in the Midwest Region of the United States.

5.1.8 Seismic Impact Zones {s. NR504.04(3)(h)}

According to the USGS Earthquake Hazards Program U.S Seismic Hazards Map, the active or proposed expansion footprint, and most of Wisconsin in general, is located in an area of very low seismic hazard. Appendix D includes a copy of the USGS Seismic-Hazard Maps for the Conterminous United States, 2014.

5.1.9 Unstable Areas {s. NR504.04(3)(i)}

There is no known current or historic data for the site that would suggest that the current landfill or proposed expansion footprint is located in an unstable area. Further discussion relating to stability will be addressed in the Feasibility Report.

5.2 Performance Standards

As discussed, following, the preliminary review of the performance standard requirements for the proposed horizontal and vertical expansion do not indicate any potential conflicts.

5.2.1 Impacts to Wetlands {s. NR504.04(4)(a)}

The proposed expansion will not have a significant adverse impact on wetlands. There are no wetlands present in the expansion area and storm water run-off from the area during construction and operation will be managed in accordance with applicable storm water regulations.

5.2.2 Endangered and Threatened Species {s. NR504.04(4)(b)}

The proposed expansion will not include a “take” of an endangered or threatened species. Please refer to Section 3 and Appendix B for more detail

5.2.3 Detrimental Effects to Surface Water {s. NR504.04(4)(c)}

The proposed expansion will not have a detrimental effect on surface water quality assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. Surface water will be managed in accordance with applicable regulations and surface water management systems will be designed and maintained in accordance with industry best management practices. Details of the storm water management system design will be provided in the Feasibility Report.

5.2.4 Detrimental Effects to Groundwater Water {s. NR504.04(4)(d)}

The proposed expansion will not cause or exacerbate an attainment or exceedance of a groundwater quality standard assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. The expansion will include a “state of the art” landfill liner and leachate collection system to prevent the release of contamination to the subsurface and groundwater. Details of the landfill design will be provided in the Feasibility Report.

5.2.5 Migration of Explosive Gas {s. NR504.04(4)(e)}

The proposed expansion will not cause the migration of explosive gases in excess of 25 percent of the lower explosive limit (LEL) assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. The expansion will include a “state of the art” landfill liner and expansion of the landfill gas collection system to minimize the migration and fugitive emission of methane to the atmosphere and subsurface. Details of the landfill design will be provided in the Feasibility Report.

5.2.6 Hazardous Air Emissions {s. NR504.04(4)(f)}

The proposed expansion will not cause the emission of any hazardous air contaminant (HAP) exceeding the limitations contained in s. NR445.07 Wisconsin Administrative Code assuming the landfill is designed, constructed and operated in accordance with State regulations and approvals. Details of the landfill gas collection and monitoring system design will be provided in the Feasibility Report.

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Tables

Table 1 – Adjacent Property Owners
Table 2 – Locational Criteria and Performance Standards Summary

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Table 1

Adjacent Land Owners

MAP ID	PARCEL ID	OWNER	OWNER 2	POSTAL ADDRESS	SITE ADDRESS
1	036-00411-00	RANDY D & KAREN M CRUME		E8284 SEAS BRANCH RD, VIROQUA, WI, 546	
2	036-00393-00	RANDY D & KAREN M CRUME		E8284 SEAS BRANCH RD, VIROQUA, WI, 546	E8284 SEAS BRANCH RD
3	036-00410-00	ALVIN L WOODMANSEE	C/O SUSAN WOODMAN	201 N WALBRIDGE AVE 111, MADISON, WI, !	
4	036-00408-00	PAULINE A BUCKLAND		PO BOX 174, VIROQUA, WI, 54665	
5	036-00379-00	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, W	
6	036-00381-00	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, W	
7	036-00674-00	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, W	
8	036-00638-00	MADELINE CLEMENTS	STEVEN & DEBRA CLARI	210 N WASHINGTON, VIROQUA, WI, 54665	E8454 N ASBURY RD
9	036-00637-00	WISCONSIN RSA #8	LIMITED PARTNERSHIP	8410 W BRYN MAWR AVE, CHICAGO, IL, 606	
10	036-00635-00	ZION CHURCH			
11	036-00645-00	JEROME J & SHARON M BUTERA		E8449 N ASBURY RD, VIROQUA, WI, 54665	E8449 N ASBURY RD
12	036-00644-00	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, W	
13	036-00642-00	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, W	
14	036-00643-00	JOHN & LINDA KIELER REVOCABLE T		748 COUNTY RD Z, HAZEL GREEN, WI, 53811	
15	036-00641-00	ROBERT J & TAMMY L MENNE		E8327 N ASBURY RD, VIROQUA, WI, 54665	E8327 N ASBURY RD
16	036-00652-00	JOHN & LINDA KIELER REVOCABLE T		748 COUNTY RD Z, HAZEL GREEN, WI, 53811	
17	036-00647-00	CHAD B WILLIAMS		E7541 COUNTY RD SS, VIROQUA, WI, 54665	E8263 N ASBURY RD
18	036-00650-00	JOHN & LINDA KIELER REVOCABLE T		748 COUNTY RD Z, HAZEL GREEN, WI, 53811	
19	036-00649-00	WAYNE K KRUIZENGA	JULIE KRUIZENGA	E8107 COUNTY RD LF, VIROQUA, WI, 54665	
20	036-00406-00	ALICE MAE NELSON		E8137 COUNTY RD Y, VIROQUA, WI, 54665	
21	036-00405-00	ALICE MAE NELSON		E8137 COUNTY RD Y, VIROQUA, WI, 54665	E8137 COUNTY ROAD Y
22	036-00404-00	GRACE ACRES LLC		E8219 COUNTY RD Y, VIROQUA, WI, 54665	
23	036-00402-00	GRACE ACRES LLC		E8219 COUNTY RD Y, VIROQUA, WI, 54665	E8219 COUNTY ROAD Y

Table 2
Locational Criteria and Performance Standard Summary

Locational/Performance Criteria	Wisconsin Administrative Code	Compliance (Y or N)	Remarks
Locational Criteria			
1,000 ft from any navigable lake, pond or flowage	NR 504.04(3)(a)	Y	Refer to Section 5.1.1
300 ft from any navigable river or stream	NR 504.04(3)(b)	Y	Refer to Section 5.1.2
Floodplain	NR 504.04(3)(c)	Y	Refer to Section 5.1.3
1,000 ft of the nearest R/O/W of any state trunk, interstate or federal aid highway or boundry of a public park unless the landfill is screened	NR 504.04(3)(d)	Y	Refer to Section 5.1.4
Airport Safety	NR 504.04(3)(e)	Y	Expansion of an existing landfill is exempt from the minumum setback requirements. (Refer to Section 5.1.5)
Within 1,200 ft of a private water supply well	NR 504.04(3)(f)	Y	Refer to Section 5.1.6
Within 200 ft. of a fault that has had displacement in Holocene time	NR 504.04(3)(g)	Y	Refer to Section 5.1.7
Within Seismic Impact Zones	NR 504.04(3)(h)	Y	Refer to Section 5.1.8
Within Unstable Areas	NR 504.04(3)(i)	Y	Refer to Section 5.1.5
Location Criteria Base Map	NR 504.04	Y	Refer to Figure 1 through Figure 5 and Section 4
Performance Standards			
A significant adverse impact on wetlands as provided for in NR 103	NR 504.04(4)(a)	Y	Refer to Section 5.2.1
A take of an endangered or threatened species	NR 504.04(4)(b)	Y	Refer to Sections 3 and 5.2.2
A detrimental effect on surface water	NR 504.04(4)(c)	ND	Pendind design and maintenance of storm water management systems. (Refer to Section 5.2.3)
A detrimental effect on groundwater quality…	NR 504.04(4)(d)	ND	Pending landfill design and analysis of groundwater data in the feasibility report. (Refer to Section 5.2.4)
Migration and concentration of explosive gas…in excess of 25% of the LEL…	NR 504.04(4)(e)	ND	Pending landfill and landfill gas collection system design in the feasibility report. (Refer to Section 5.2.5)
Emissions of any hazardous air contaminants excess of 25% LEL.	NR 504.04(4)(f)	ND	Pending landfill and landfill gas collection system design in the feasibility report. (Refer to Section 5.2.6)

Notes:
Y= Yes
ND= Not Determined- Determination to be proviced in future submittals

Note : Figures 1 through 5 not included. Please refer to Appendix E of the ISR.

Figures

Figure 1 – Site Location
Figure 2 – Residential and Private Wells Within 1-Mile of Horizontal Expansion
Figure 3 – Floodplains and Water Features Within 1-Mile of Horizontal Expansion
Figure 4 – Topography Within 1-Mile of Horizontal Expansion
Figure 5 – Existing Land Use Within 1-Mile of Horizontal Expansion

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Appendix A

ISI Request Checklist

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LANDFILL INITIAL SITE INSPECTION REQUEST
COMPLETENESS CHECKLIST

SECTION NR 503.07, WISCONSIN ADMINISTRATIVE CODE – C&D AND ONE-TIME DISPOSAL LANDFILLS
SECTION NR 509.04, WISCONSIN ADMINISTRATIVE CODE – ALL OTHER LANDFILLS

Refer to Applicable Codes for Exact Requirements

General Information

Applicant:

Applicant Name: Vernon County Landfill

Contact/Title: Stacie Sanborn

Address: S3705 County Road LF, Viroqua, WI

Phone #: 608-634-2900

FID #: 6630308310

Site Location: South ½ of Section 15, T13N, R4W
Town of Viroqua, Vernon County, WI

Date of Initial Site Inspection Request: 10/30/2020

Consultant:

Consultant Name: SEH

Contact/Title: Brian Kent

Address: 329 Jay Street Suite 301, La Crosse, WI

Phone #: 608-498.4844

Date Project Entered into FIST System: _____

Date ISI is Due (Max. 22 bus. Days after receipt of request):

_____

Legal Note:
This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

GENERAL SUBMITTAL REQUIREMENTS - NR 503.07(2) or 509.04(2)	Y	N	NA	LOCATION	COMMENTS
1. Report sent to region and central office	x				see distribution list
2. Current standard technical procedures used and test methods specified – NR 500.05(5)			x		Not applicable
3. Visuals - NR 500.05(6)					
a. 8.5x11 to 32x44 inches in size	x				
b. Appropriate scale to show all required details with sufficient clarity	x				
c. Be numbered; referenced in the narrative; have a title, legend, horizontal and vertical scales; and drafting or origination dates	x				
d. Uniform scales	x				
e. North arrow	x				
f. Mean sea level as basis for all elevations	x				
g. Survey grid based on field monuments and utilizing a coordinate system acceptable to the department	x				
h. Original topography and grid system on plan sheets showing construction, operation or closure topography				x	
i. Cross-sections include survey grid location, reference to major plan sheets and reduced diagram of cross-section location plan view map				x	
3. Table of contents – NR 500.05(7)	x				
4. Appendix listing all references, raw data, testing and sampling procedures and calculations – NR 500.05(8)	x				

LANDFILL REQUEST MINIMUM REQUIREMENTS - NR 503.07(4) or 509.04(4)	Y	N	NA	LOCATION	COMMENTS
1. Cover Letter					
a. Applicant identified	x				Section 2.3
b. Authorized contact identified	x				Section 2.4
c. Current property owner identified	x				Section 2.3
d. Type of landfill being proposed	x				Section 2.1
e. Project location by ¼, ¼ section	x				Section 2.2
f. Present land use	x				Section 2.5
2. Known potential impacts to endangered and threatened species - NR 29	x				Section 3.1
3. Known potential impacts to historic, scientific or archeological areas, including prior studies or surveys, identified - s. 44.40, Wis. Stats.	x				Section 3.2
4. Enlarged 7.5 minute USGS map or equivalent (minimum 1"=500')					
a. Ground surface relief within one mile of project	x				Figure 1 and Figure 4
b. Surface water bodies within one mile of project	x				Figure 3
c. Floodplains within one mile of project	x				Figure 3
d. Existing land use within one mile of project	x				Figure 5
e. All water supply wells and residences within one mile of project	x				Figure 2
5. Preliminary identification of all potential conflicts with locational criteria and performance standards in: ● for C&D and one-time disposal landfills, NR 503.04 ● for all other landfills, NR 504.04 excluding NR 504.04(4)(d) to (f)	x				Sections 5.1 and 5.2

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Appendix B

ER/NHI Report

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State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 South Webster Street
P.O. Box 7921
Madison, WI 53707-7921

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone (608) 266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

October 2, 2020

Brian Kent
SEH
bkent@sehinc.com
608-498-4844

SUBJECT: RE: ER/NHI Review – Vernon County, Wisconsin
30-acre parcel in Vernon County, Town of Viroqua

Dear Brian Kent:

Per your request, I have reviewed a 30-acre parcel for potential endangered resources and archaeological sites in Vernon County located partially in the SE ¼ of the SW ¼ of Section 15, Township 13 North, Range 4 West.

There are no concerns for endangered resources for this 30-acre parcel. There are no elemental occurrences within the 2-mile buffer, so this can be covered under a Broad Incidental Take Permit/Authorization (BITPA), activity 2-A3. More information on this BITPA can be found here https://dnr.wisconsin.gov/topic/erreview/ITNoLowImpact.html.

There are no concerns for archaeological or historical sites within this 30-acre parcel.

Please include this letter with future permit submittals to the WDNR.

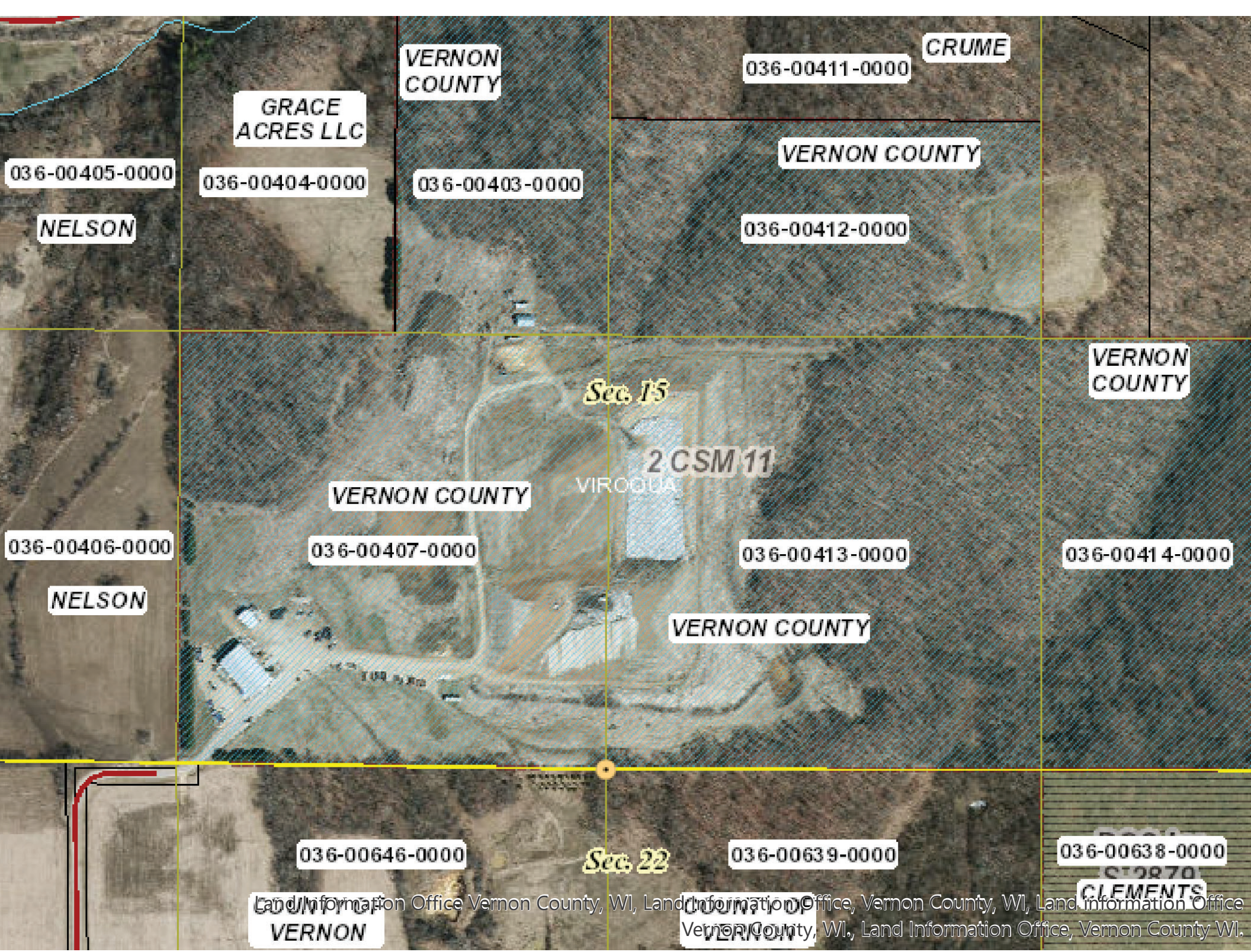
Sincerely,

Laura Spears

Laura Spears
Wastewater Specialist – Stormwater
Stormwater Runoff Section

Attached: Parcel location map

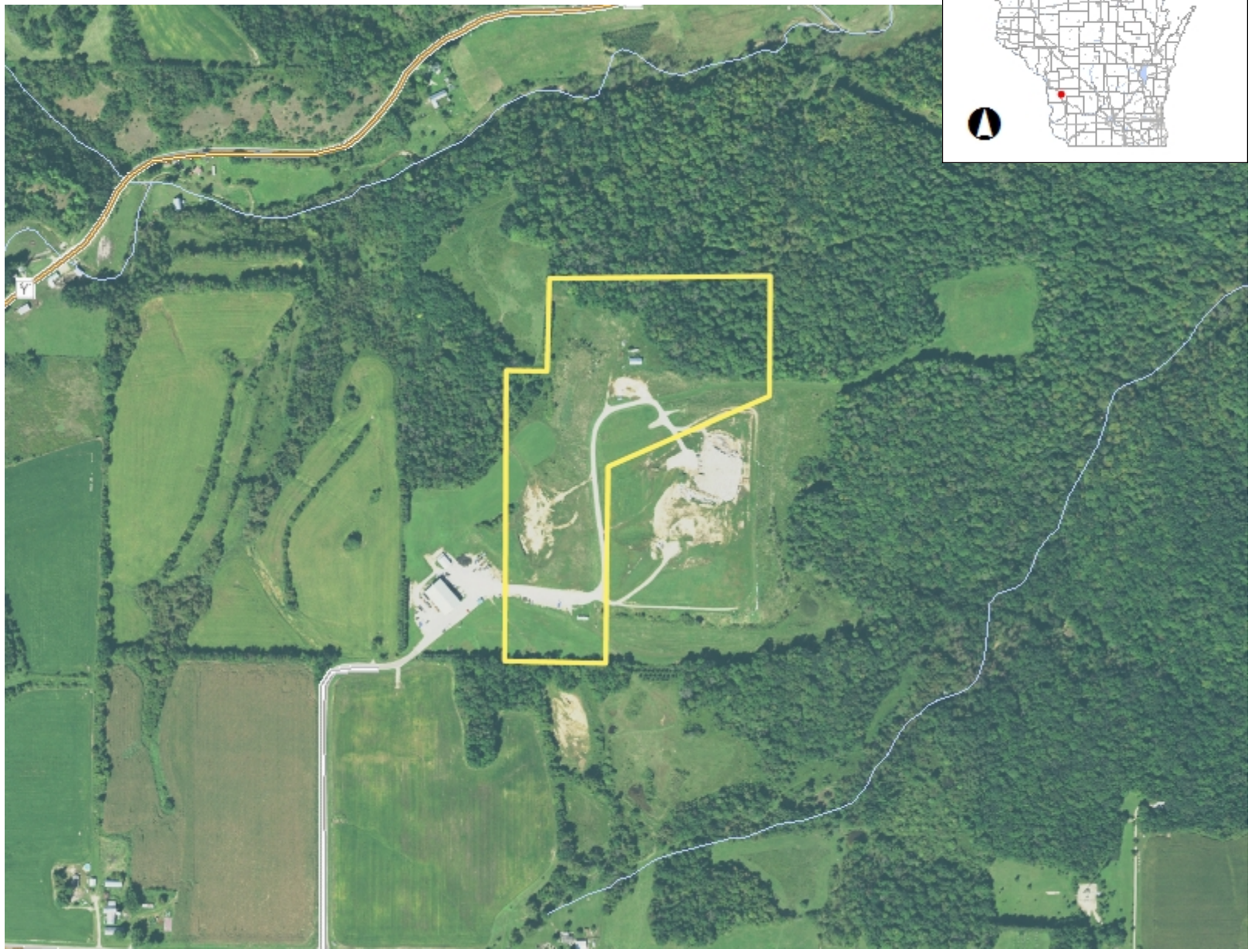
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Land Information Office Vernon County, WI, Land Information Office, Vernon County, WI, Land Information Office
Vernon County, WI., Land Information Office, Vernon County WI.

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Surface Water Data Viewer Map





Legend

- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

Notes

0.3 0 0.13 0.3 Miles

NAD_1983_HARN_Wisconsin_TM

1: 7,920

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/

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DFUH SDUFHO RQ &RXQW\

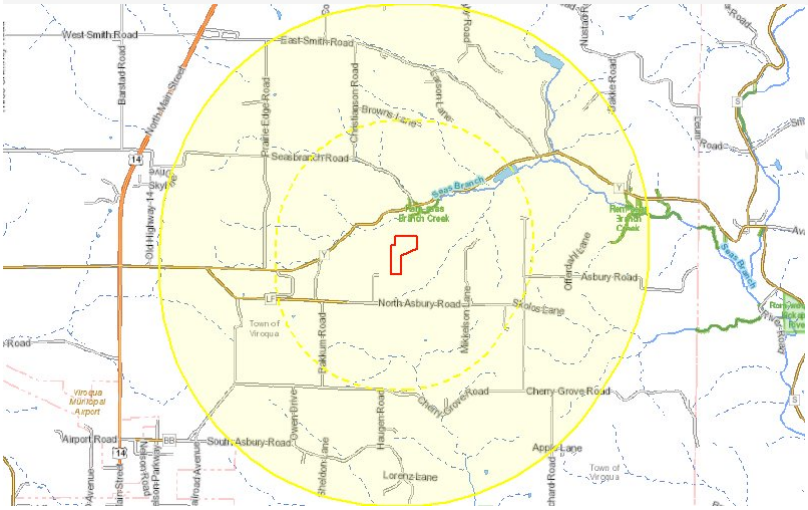
5HYLHZHU ,QIRUPDWLRQ

5HYLHZHU 1DPH	/DXUD 6SHDUV
5HYLHZ 'DWH	˘
%XUHDX 2UJ 1DPH	: DWHUVKHG 0DQDJHPHQW
: RUN 6WDWLRQ	,RZD

*HQHUDO ,QIRUPDWLRQ

3URMHFW 1DPH	DFUH SDUFHO RQ &RXQW\
3URMHFW 1R	
)HGHUDO 1H[XV	
3URMHFW 7\SH	
3URSRVHG 7\SH	

0DS



3URMHFW /RFDWLRQ

&RXQW\	9HUQRQ
3/66 'HVFULSWLRQ	7 1 5 : 6 ˘
7RZQVKLS 1DPH	9LURTXD
2ZQHUVKLS 7\SH	
/DQGRZQHU 1DPH	

3URMHFW ,QIRUPDWLRQ

'HVFULSWLRQ	'LVWXUEDQFH WR D DFUH SDUFHO
+DELWDW 'HVFULSWLRQ	H[LVWLQJ ODQGILOO DQG ZRRGHG
,PSDFWV WR :HWODQGV DQG :DWHUERGLHV	
$GGLWLRQDO '15 DQG 2WKHU 3HUPLWV	

(OHPHQW 2FFXUUHQFHV

1R HOHPHQW RFFXUHQFHV H[LVW LQ WKLV DUHD

$FWLRQV WKDW QHHG WR EH WDNHQ WR FRPSO\ ZLWK 1RQH DQG RU IHGHUDO HQGD

$FWLRQV UHFRPPHQGHG WR KHOS FRQVHUYH 1RQH NQRZQ

$GGLWLRQDO 5HFRPPHQGDWLRQV (URVLRQ FRQWURO PHDVXUHV UHFRPPHQGHG IRU

1R DFWLRQV DUH UHTXLUHG RU UHFRPPHQGHG IRU WKH IROORZLQJ HQGDQJHUHG UH

'LVFODLPHU

7KLV (5 5HYLHZ PD\ FRQWDLQ 1DWXUDO +HULWDJH RI 1RUWKHUQ ,UHODQG GDWD SURYLGHG E\ WKLUG SDUWLHV ZKLFK DUH FRQVLGHUHG VHQVLWLYH DQG FRQILGHQWLDO (5 5HYLHZ PD\ EH VKDUHG RQO\ ZLWK LQGLYLGXDOV RU DJHQFLHV WKDW UHTXLUH WK SODQQLQJ DQG LPSOHPHQWDWLRQ RI WKH SURSRVHG SURMHFW 6SHFLILF ORFDWLRQ SXEOLFO\ GLVVHPLQDWHG GRFXPHQWV

'HWDLOV UHODWHG WR SURMHFW ORFDWLRQ GHVLJQ DQG WLPLQJ RI GLVWXUEDQFH EH LPSDFWHG E\ WKH SURMHFW DQG DQ\ QHFHVVDU\ IROORZ XS DFWLRQV ,I WKH SU \HDU SDVVHG SOHDVH UHQHZ WKLV UHYLHZ

Appendix C

FAA Correspondence

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Building a Better World for All of Us®

October 23, 2020

RE: Vernon County Landfill
Proposed Landfill Expansion (WDNR License No. 3268)
SEH No. VERSW 157634 14.00

FAA Airport Division
AGL - 600
2300 East Devon Avenue
Des Plaines, IL 60018

Dear Sir or Madam:

Short Elliott Hendrickson Inc. (SEH) is submitting this letter on behalf of Vernon County to notify the Federal Aviation Administration (FAA), and other concerned parties, of the County's proposed expansion of the Vernon County Landfill (WDNR License No. 3268). This notification is being provided to meet the provisions and requirements outlined in the following State and Federal Rules and guidance:

- s. NR504.04(3)(e) Wisconsin Administrative Code
- 40 CFR 258.10 –Airport Safety
- 49 USC Section 44718(d), as amended by Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L No. 106-181 (April 5, 2000)
- FAA Advisory Circular AC No. 150/5200-34A (January 26, 2006) : Construction or Establishment of Landfills Near Public Airports
- FAA Advisory Circular AC No. 150/5200-33B (August 28, 2007) : Hazardous Wildlife Attractants On Or Near Airports

The proposed Vernon County Landfill Expansion (Landfill Expansion) is located in the Southern Half of Section 12, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin. The proposed horizontal landfill expansion encompasses approximately 10-acres due west and north and contiguous to the current permitted landfill. As shown the Attached Figure 1, "Site Location" the landfill expansion is located approximately 2.8 miles northeast of the closest runway at the Viroqua Municipal Airport and the existing landfill and expansion are not located in the approach or departure path for the airport.

The limitations of 49 USC Section 44718(d) apply to new municipal solid waste landfills (MSWLF's), which are defined as a municipal waste landfill that was established or constructed after April 5, 2000. Additionally, FAA Advisory Circular AC No. 150/5200-34A states that 49 USC Section 44718(d) does not apply to the expansion or modification of an existing MSWLF. The current active Vernon County Landfill was first constructed in 1993, therefore exempt from the limitations of 49 USC Section 44718(d).

As part of the last expansion process, Vernon County issued a letter to the FAA on May 29, 2002 notifying interested parties of their intention to expand. In a letter dated June 16, 2002 the FAA responded with a letter concurring with the proposal relative to compatibility standards contained in FAA Advisory Circular AC No. 150/5200-33, with the following conditions:

1. The landfill facility must be properly supervised to assure that the bird populations are not increasing and that appropriate control procedures are being followed.
2. Any increases in bird activity that might be hazardous to safe aircraft operations will result in prompt mitigation actions and/or closure of the landfill
3. The above conditions must be clearly defined via State/Local licensing procedures associated with establishment of the landfill.
4. The landfill owner/operator should develop and implement a Wildlife Hazard Management Plan for operation of the landfill.

A Wildlife Hazard Management Plan (Plan) was included in their Plan of Operation, which has been approved by the WDNR and part of the facility operating record. The Plan utilizes the following strategies:

- Minimization of standing water areas
- Minimization of uncovered waste areas
- Prompt revegetation of disturbed areas outside of the waste footprint
- Utilization of bird harassment techniques, perch deterrents, and avoidance structures, as needed

We understand that the FAA does not approve or disapprove of solid waste landfill locations but is primarily concerned about location relative to safety. We request that you review this letter and attachments and reply with your assessment of the proposed landfill expansion. Please contact me at 608.498.4844 with any questions or concerns.

Sincerely,

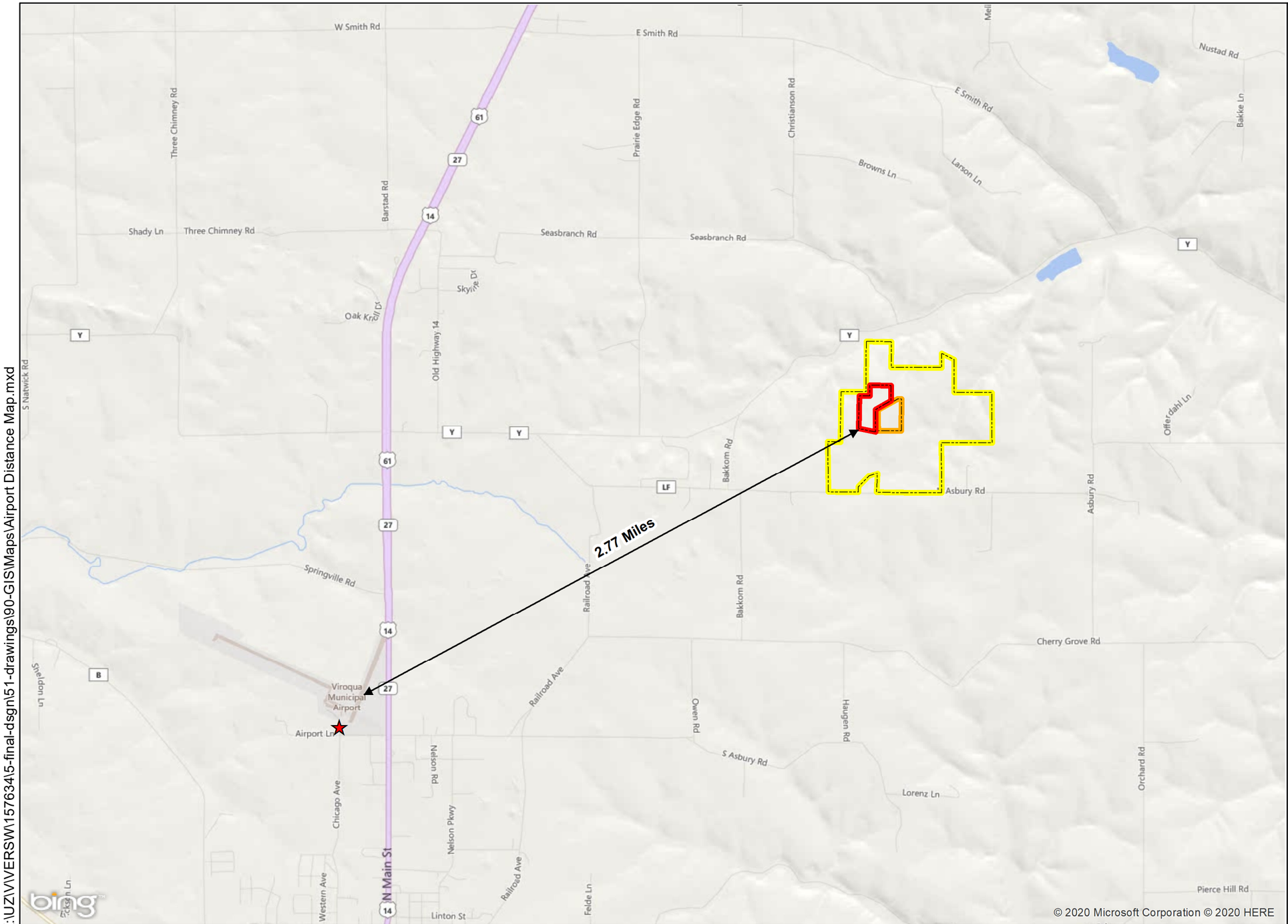
SHORT ELLIOTT HENDRICKSON INC.



Brian L. Kent, CHMM
Project Manager

BLK
Attachment
c: Stacie Sanborn, Vernon County Solid Waste (electronic)
Stacey Miller, Wisconsin DOT, Bureau of Aeronautics
Michael Skildum, Viroqua Municipal Airport Manager
Darryl R. Heaps, SEH (electronic)

x:\uz\v\versw\157634\3-env-stdy-regs\isi_isr\faa_airport\versw_faa notification letter 10.23.2020.docx



Legend

- Landfill Property Boundary
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Landfill Expansion

N
W E
S

0 0.25 0.5 1 Miles

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
rjh

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. If errors or discrepancies are found please contact SEH GIS Services. This user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.

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SEH
10 North Bridge Street
Chippewa Falls, WI 54729
PHONE: (715) 720-6200
FAX: (715) 720-6300
WATTS: 800-472-5881
www.sehinc.com

PROJECT: VERSW157634

DATE: 10/20/2020

ISI REQUEST
VERNON COUNTY LANDFILL
(WIDNR LICENSE NO.3268)

Distance to Viroqua Municipal Airport

Figure 1

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Appendix D

USGS Maps

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U.S. Geological Survey Quaternary Faults



5/6/2019 2:30:33 PM

1:18,489,298

0 175 350 700 mi

0 270 540 1,080 km

Quaternary faults

- unspecified age, well constrained location
- unspecified age, moderately constrained location
- unspecified age, inferred location
- undifferentiated Quaternary (< 130,000 years), well constrained location
- undifferentiated Quaternary (< 130,000 years), moderately constrained location
- undifferentiated Quaternary (< 130,000 years), inferred location
- middle and late Quaternary (< 1.6 million years), well constrained location
- middle and late Quaternary (< 1.6 million years), moderately constrained location
- middle and late Quaternary (< 1.6 million years), inferred location
- latest Quaternary (<15,000 years), well constrained location

USGS, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

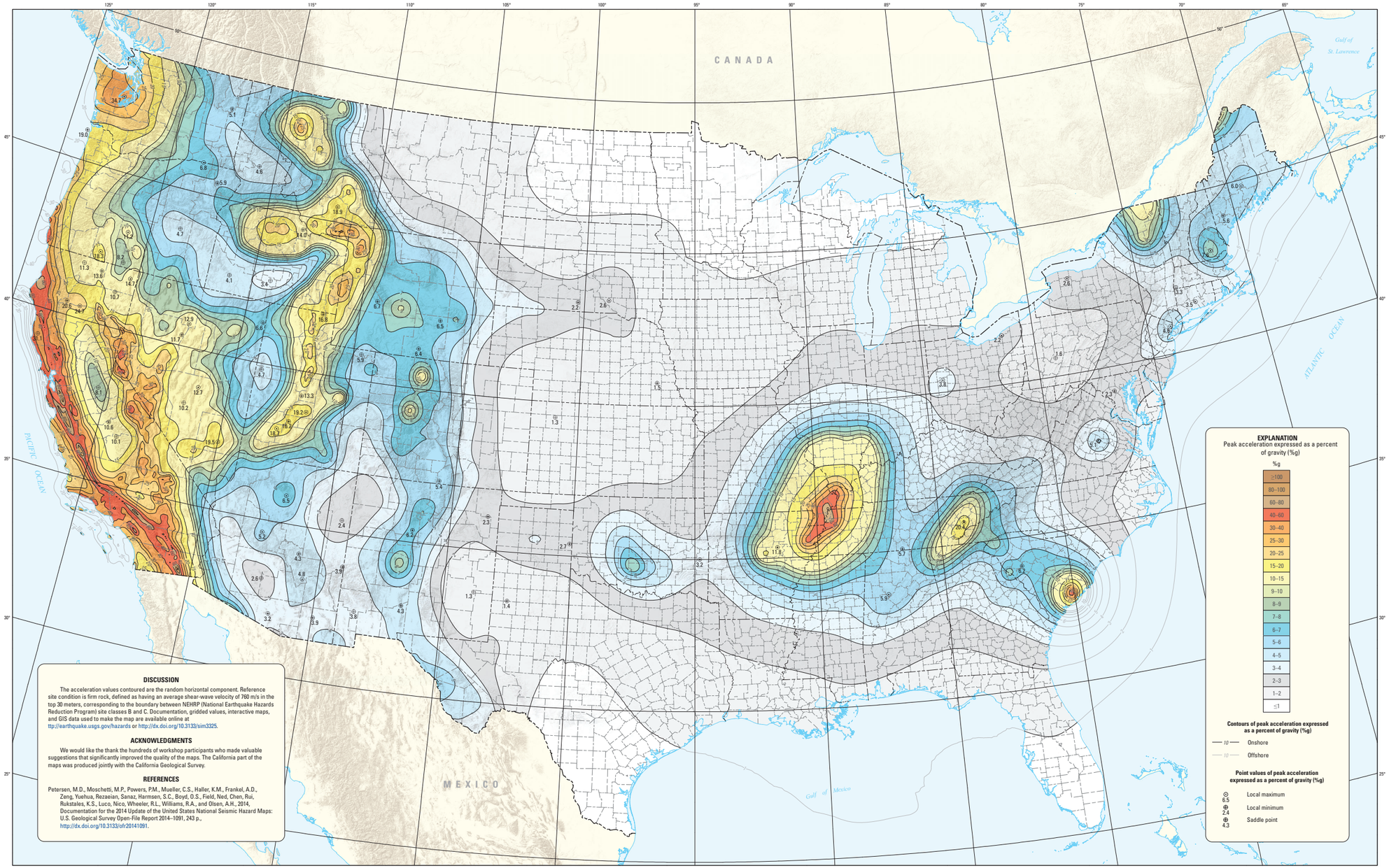
USGS

USGS | National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp. |

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U.S. Department of the Interior
U.S. Geological Survey

Scientific Investigations Map 3325
Sheet 1 of 6



DISCUSSION

The acceleration values contoured are the random horizontal component. Reference site condition is firm rock, defined as having an average shear-wave velocity of 760 m/s in the top 30 meters, corresponding to the boundary between NEHRP (National Earthquake Hazards Reduction Program) site classes B and C. Documentation, gridded values, interactive maps, and GIS data used to make the map are available online at ftp://earthquake.usgs.gov/hazards or http://dx.doi.org/10.3133/sim3325.

ACKNOWLEDGMENTS

We would like the thank the hundreds of workshop participants who made valuable suggestions that significantly improved the quality of the maps. The California part of the maps was produced jointly with the California Geological Survey.

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Petersen, M.D., Moschetti, M.P., Powers, P.M., Mueller, C.S., Haller, K.M., Frankel, A.D., Zeng, Yuehua, Rezaeian, Sanaz, Harmsen, S.C., Boyd, O.S., Field, Ned, Chen, Rui, Rukstales, K.S., Luco, Nico, Wheeler, R.L., Williams, R.A., and Olsen, A.H., 2014, Documentation for the 2014 Update of the United States National Seismic Hazard Maps: U.S. Geological Survey Open-File Report 2014–1091, 243 p., http://dx.doi.org/10.3133/ofr20141091.

SCALE 1:7 000 000

100 0 100 200 300 400 500 600 700 800 900 1000 MILES

100 0 100 200 300 400 500 600 700 800 900 1000 KILOMETERS

Shaded relief base from Esri Inc., 2008, Data and Maps
All other base map data from Esri Inc., 1993, Digital Chart of the World
United States County base map from the U.S. Geological Survey National Atlas, available at http://nationalatlas.gov/

Projection: Albers equal-area conic
Standard parallels 29.5°N. and 45.5°N., central meridian 95°W

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Center Director, USGS Geologic Hazards Science Center
Box 25046, Mail Stop 966
Denver, CO 80225
(303) 273-8579
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Seismic-Hazard Maps for the Conterminous United States, 2014

Peak Horizontal Acceleration with 10 Percent Probability of Exceedance in 50 Years

By

Mark D. Petersen,[1] Morgan P. Moschetti,[1] Peter M. Powers,[1] Charles S. Mueller,[1] Kathleen M. Haller,[1]Arthur D. Frankel,[1] Yuehua Zeng,[1] Sanaz Rezaeian,[1] Stephen C. Harmsen,[1] Oliver S. Boyd,[1] Edward H. Field,[1] Rui Chen,[2] Nicolas Luco,[1]Russell L. Wheeler,[1] Robert A. Williams,[1] Anna H. Olsen,[1] and Kenneth S. Rukstales[1]

2015

[1]U.S. Geological Survey
[2]California Geological Survey, Sacramento, Calif.

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Appendix B

Wetland Determination

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TECHNICAL MEMORANDUM

TO: Stacie Sanborn, Vernon County Solid Waste Department

FROM: Renee Wilde, PWS, CFM - SEH Wetland Scientist
WDNR Assured Wetland Delineator

DATE: June 4, 2021

RE: 2021 Expansion Planning – Evaluation for Wetlands
SEH No. VERSW 157634 14.00

This Memorandum summarizes SEH's site reconnaissance for the proposed expansion of the landfill area at the Vernon County Solid Waste and Recycling Facility, located at S3705 County Road LF, Viroqua, WI. SEH reviewed the natural vegetation and landscape conditions in the landfill expansion area to determine if any areas met the technical criteria of a wetland, as set forth in the U.S. Army Corps of Engineers *Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to Wetland Delineation Manual: Midwest Region* (USACE 2010) on May 4, 2021. The field reconnaissance was completed by Renee Wilde, PWS, CFM, Wisconsin Department of Natural Resources (WDNR) Assured Wetland Delineator.

The site is located in the southwest 1/4 of Section 15 in Township 13 North, Range 4 West in the Town of Viroqua, Vernon County, Wisconsin (**Figure 1**). In general, the property is located north of County Road LF, east of Bakkom Road, south of County Road Y, and west of Asbury Road.

The approximately 10.4-acre survey area is located north of the existing landfill footprint, as shown on **Figure 2**. The landfill facility is located along a ridgeline within the Western Coulee and Ridges ecological landscape. The landscape within the project area drains north towards the Seas Branch, which flows east to the West Fork of the Kickapoo River. The project site is approximately 160-180 feet higher in elevation than the waterway. In general, the current landfill operation and proposed expansion area sits high in the landscape. Representative photographs (**Appendix A**) of the area investigated are attached.

All three of the following criteria must be present in order to make a positive wetland determination, which are as follows: 1) Greater than 50% dominance of hydrophytic plant species, 2) Presence of hydric soil, and 3) Indicators of wetland hydrology observed. To document current site conditions, sample point data was collected and recorded on Wetland Determination Data Forms (**Appendix B**).

The WDNR Wisconsin Wetlands Inventory (WWI) does not identify wetlands within the survey limits, nor within the general vicinity. Soils within the project area are classified as "Valton silt loam," "Pepin silt loam," and "Mt. Carroll silt loam" by the Natural Resource Conservation Service (NRCS). These types of soils are classified as non-hydric, which is consistent with observations made during the site visit. Four "wet spots" were identified by the NRCS as areas that have the potential to be wetland (**Figure 2**). These areas were investigated to determine the presence or absence of wetlands.

A potential "wet spot" was identified by the NRCS in the southwest portion of the site. At this location, the area is a transition zone between an open field and forested, and the ground elevation slopes towards the northwest.

Sample point data (SP1U) was collected to document site conditions. Vegetation was dominated by Kentucky bluegrass (*Poa pratensis* – FAC), Canadian goldenrod (*Solidago canadensis* – FACU), and Allegheny blackberry (*Rhubus allegheniensis* – FACU) in the herbaceous stratum, choke cherry (*Prunus virginiana* – FACU) in the shrub stratum, and black cherry and ash-leaf maple/boxelder (*Acer negundo* – FAC) in the tree stratum. Soils at SP1U are composed of 6 inches of dark yellowish brown (10YR 3/4) silty clay loam, underlain by 4 inches of dark yellowish brown (10YR 4/4) loam. This was followed by 4 inches of yellowish brown (10YR 5/4) loam with 5% redoximorphic concentrations (10YR 4/4), and at least 8 inches of yellowish brown (10YR 5/4) clay loam with 20% redoximorphic concentrations (10YR 4/4). The soil profile does not meet the technical criteria for hydric soils. No primary or secondary hydrology indicators were present. None of the three wetland criteria were met, therefore the area is non-wetland.

Within the forested area in the northwest portion of the site, multiple NRCS “wet spots” were mapped. The forested appears to have been selectively logged in the past. There are multiple old logging roads in this area that have overgrown with grasses. It is anticipated that these grassed roads appear “greener” on aerial photographs and is likely the reason potential “wet spots” were marked here. Topography in the forest slopes relatively steeply towards the east and northeast. Sample point data (SP2U) was collected in the vicinity of the marked “wet spots.” Vegetation within the forest was dominated by Spotted crane’s bill/wild geranium (Geranium maculatum – FACU), Kentucky bluegrass, Pennsylvania sedge (*Carex pensylvanica* – UPL), Virginia spring beauty (*Claytonia virginica* – FACU), creeping buttercup (*Ranunculus repens* – FAC), hooded blue violet (*Viola sororia* – FAC), and Shawnee-salad/Virginia waterleaf (*Hydrophyllum virginianum* – FAC) in the herbaceous stratum; the shrub stratum was dominated by American elm (*Ulmus americana* – FACW) and the tree stratum was dominated by American elm, red maple (*Acer rubrum* – FAC), and northern red oak (*Quercus rubra* – FACU). Soils at SP2U are composed of 3 inches of dark brown (10YR 3/3) silt loam, underlain by 8 inches of dark yellowish brown (10YR 3/4) silt loam. This was followed by 4 inches of dark yellowish brown (10YR 3/6) silt loam, and at least 7 inches of dark yellowish brown (10YR 4/4) silt loam. The soil profile does not meet the technical criteria for hydric soils. No primary or secondary hydrology indicators were present. Although the hydrophytic vegetation criteria was met, hydric soils and hydrology was not present, therefore the area does not meet wetland criteria.

The field visit was conducted under temperature that were normal and precipitation conditions that were drier than normal as compared to the historical average for the region according to USDA Field Office Climate Data WETS tables from the Viroqua, WI Station in Vernon County (**Appendix C**). The drier than normal conditions did not hinder the investigation for wetlands.

From this field visit, it was concluded that no areas meeting the technical criteria for wetland are present within the area investigated.

Thank you for the opportunity to provide wetland services to the Vernon County Solid Waste Department. Short Elliott Hendrickson Inc. (SEH®) is pleased to provide you with this information for your records. If you have any questions, please contact me directly at 715-720-6263 or via e-mail at rwilde@sehinc.com.

Attachments
Figure 1 – Site Location & Topographic Map
Figure 2 – Wisconsin Wetland Inventory & Vernon County Soil Survey

Appendix A – Site Photographs
Appendix B – Wetland Determination Data Forms
Appendix C – Climate Summary Data



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SEH
10 NORTH BRIDGE STREET
CHIPPEWA FALLS, WI 54729-2550
PHONE: (715) 720-6200
FAX: (888) 908-8166
TF: (800) 472-5881
www.sehinc.com

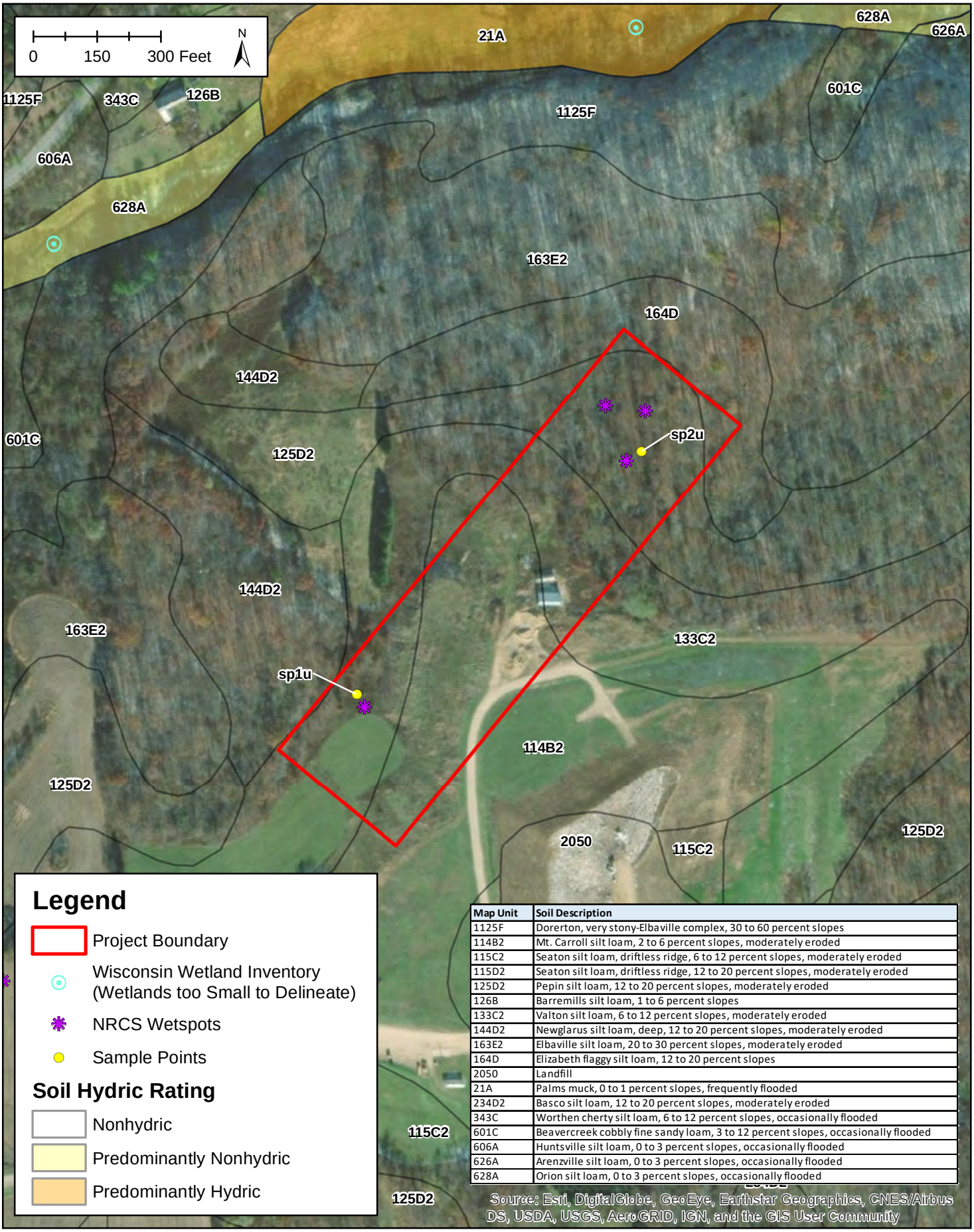
Project: VERSW 157634
Print Date: 6/1/2021

Map by: mfalk
Prj: WISCRS, Vernon Co (ft)
Source: WDNR, USGS, Vernon County

Site Location and Topographic Map
2021 Expansion Planning
Town of Viroqua, Vernon County, WI

Figure 1

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Map Unit	Soil Description
1125F	Dorerton, very stony-Elbaville complex, 30 to 60 percent slopes
114B2	Mt. Carroll silt loam, 2 to 6 percent slopes, moderately eroded
115C2	Seaton silt loam, driftless ridge, 6 to 12 percent slopes, moderately eroded
115D2	Seaton silt loam, driftless ridge, 12 to 20 percent slopes, moderately eroded
125D2	Pepin silt loam, 12 to 20 percent slopes, moderately eroded
126B	Barremills silt loam, 1 to 6 percent slopes
133C2	Valton silt loam, 6 to 12 percent slopes, moderately eroded
144D2	Newglarus silt loam, deep, 12 to 20 percent slopes, moderately eroded
163E2	Elbaville silt loam, 20 to 30 percent slopes, moderately eroded
164D	Elizabeth flaggy silt loam, 12 to 20 percent slopes
2050	Landfill
21A	Palms muck, 0 to 1 percent slopes, frequently flooded
234D2	Basco silt loam, 12 to 20 percent slopes, moderately eroded
343C	Worthen cherty silt loam, 6 to 12 percent slopes, occasionally flooded
601C	Beavercreek cobbly fine sandy loam, 3 to 12 percent slopes, occasionally flooded
606A	Huntsville silt loam, 0 to 3 percent slopes, occasionally flooded
626A	Arenzville silt loam, 0 to 3 percent slopes, occasionally flooded
628A	Orion silt loam, 0 to 3 percent slopes, occasionally flooded

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SEH
10 NORTH BRIDGE STREET
CHIPPEWA FALLS, WI 54729-2550
PHONE: (715) 720-6200
FAX: (888) 908-8166
TF: (800) 472-5881
www.sehinc.com

Project: VERSW 157634
Print Date: 6/1/2021

Map by: mfalk
Prj: WISCRS, Vernon Co (ft)
Aerial Year: 2020
Source: WDNR, USDA

Wisconsin Wetland Inventory and Vernon County Soil Survey
2021 Expansion Planning
Town of Viroqua, Vernon County, WI

Figure 2

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Photo 1 Upland field dominated by dandelion and clover in the southwest corner of the survey limits, facing southwest from the northern edge of the field



Photo 2 Northern edge of upland field (same as above photo), facing northwest

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Photo 3 Transition zone between shrub area and forest located north of the upland field (see Photo 1), facing north towards Sample Point 1U



Photo 4 Upland area adjacent to Sample Point 1U; area dominated by species of Kentucky bluegrass, Canada goldenrod, blackberry, and raspberry

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Photo 5 Old logging road within woods that appears to have been selectively cut in the past. In the northern portion of the site, photo taken facing northeast and approximately 50 feet inside the tree line. Trail slopes downward, towards the northeast.



Photo 6 Old logging road overgrown with grasses; the road slopes towards the northeast

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Photo 7 Intersection of two logging roads within the woods, facing south from the vicinity of Sample Point 2U. The topography slopes towards the northeast, with the landfill seen in the background.



Photo 8 Typical understory found within the forested area. The forest is high in the landscape and vegetation is dominated by upland species.

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WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: 2021 Expansion Planning | City/County: Vernon County | Sampling Date: May 4, 2021

Applicant/Owner: Vernon County Solid Waste Department | State: Wisconsin | Sampling Point: SP1U

Investigator(s): Renee Wilde, SEH | Section, Township, Range: SW 1/4 Sec 15, T13N R4W

Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Convex

Slope (%): 15% | Lat: 43° 35' 55.8" N | Long: 90° 50' 32.1" W | Datum: Vernon County Coordinates

Soil Map Unit Name: Valton silt loam, 6-12% slopes, moderately eroded (133C2) | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed?

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? N	
Hydric soil present? N	**Is the sampled area within a wetland?** N
Indicators of wetland hydrology present? N	If yes, optional wetland site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

Per National Weather Service precipitation data and WETS table, climate conditions are "drier than normal"

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' Radius)		Absolute % Cover	Dominant Species	Indicator Status
1	*Prunus virginiana* -- *Choke Cherry*	15	Y	FACU
2	*Acer negundo* -- *Ash-Leaf Maple*	5	Y	FAC
3	--			
4	--			
5	--			
		20	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' Radius)				
1	*Prunus virginiana* -- *Choke Cherry*	15	Y	FACU
2	*Acer negundo* -- *Ash-Leaf Maple*	5	N	FAC
3	*Rubus allegheniensis* -- *Allegheny Blackberry*	5	N	FACU
4	*Lonicera tatarica* -- *Twinsisters*	5	N	FACU
5	--			
		30	= Total Cover	
Herb stratum (Plot size: 5' Radius)				
1	*Poa pratensis* -- *Kentucky Blue Grass*	40	Y	FAC
2	*Solidago canadensis* -- *Canadian Goldenrod*	30	Y	FACU
3	*Rubus allegheniensis* -- *Allegheny Blackberry*	15	N	FACU
4	*Taraxacum officinale* -- *Common Dandelion*	10	N	FACU
5	--			
6	--			
7	--			
8	--			
9	--			
10	--			
		95	= Total Cover	
Woody vine stratum (Plot size: 30' Radius)				
1	--			
2	--			
		0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 5 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 40.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	95	x 4 =	380
UPL species	0	x 5 =	0
Column totals	145 (A)		530 (B)

Prevalence Index = B/A = 3.66

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- ____ Dominance test is >50%
- ____ Prevalence index is ≤3.0*
- ____ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

Note: This data sheet has been adapted to use the 2018 National Wetland Plant List:
U.S. Army Corps of Engineers 2018. National Wetland Plant List, version 3.4

SOIL **Sampling Point:** SP1U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-6	10YR 3/4	100					Silty Clay Loam	
6-10	10YR 4/4	100					Loam	
10-14	10YR 5/4	95	10YR 4/4	5	C	M	Loam	
14-22+	10YR 5/4	80	10YR 4/4	20	C	M	Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: 2021 Expansion Planning | City/County: Vernon County | Sampling Date: May 4, 2021

Applicant/Owner: Vernon County Solid Waste Department | State: Wisconsin | Sampling Point: SP2U

Investigator(s): Renee Wilde, SEH | Section, Township, Range: SW 1/4 Sec 15, T13N R4W

Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Convex

Slope (%): 25% | Lat: 43° 36' 02.0" N | Long: 90° 50' 23.1" W | Datum: Vernon County Coordinates

Soil Map Unit Name: Pepin silt loam, 12-20% slopes, moderately eroded (125D2) | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed?

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y
Hydric soil present?	N
Indicators of wetland hydrology present?	N

Is the sampled area within a wetland? N

If yes, optional wetland site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Per National Weather Service precipitation data and WETS table, climate conditions are "drier than normal"

VEGETATION -- Use scientific names of plants.

	Tree Stratum (Plot size: 30' Radius)		Absolute % Cover	Dominant Species	Indicator Status
1	*Ulmus americana*	-- *American Elm*	25	Y	FACW
2	*Acer rubrum*	-- *Red Maple*	20	Y	FAC
3	*Quercus rubra*	-- *Northern Red Oak*	15	Y	FACU
4	*Fraxinus pennsylvanica*	-- *Green Ash*	10	N	FACW
5		--			
			70	= Total Cover	
	Sapling/Shrub stratum (Plot size: 15' Radius)				
1	*Ulmus americana*	-- *American Elm*	10	Y	FACW
2		--			
3		--			
4		--			
5		--			
			10	= Total Cover	
	Herb stratum (Plot size: 5' Radius)				
1	*Geranium maculatum*	-- *Spotted Crane's-Bill*	20	Y	FACU
2	*Poa pratensis*	-- *Kentucky Blue Grass*	15	Y	FAC
3	*Carex pensylvanica*	-- *Pennsylvania Sedge*	15	Y	UPL
4	*Claytonia virginica*	-- *Virginia Springbeauty*	10	Y	FACU
5	*Ranunculus repens*	-- *Creeping Buttercup*	10	Y	FAC
6	*Viola sororia*	-- *Hooded Blue Violet*	10	Y	FAC
7	*Hydrophyllum virginianum*	-- *Shawnee-Salad*	10	Y	FAC
8	*Ribes cynosbati*	-- *Eastern Prickly Goosebe*	5	N	FAC
9	*Anemone virginiana*	-- *Tall Thimbleweed*	5	N	FACU
10	*Trillium cernuum*	-- *Whip-Poor-Will-Flower*	5	N	FAC
			105	= Total Cover	
	Woody vine stratum (Plot size: 30' Radius)				
1		--			
2		--			
			0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across all Strata: 11 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 63.64% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	45	x 2 =	90
FAC species	75	x 3 =	225
FACU species	50	x 4 =	200
UPL species	15	x 5 =	75
Column totals	185 (A)		590 (B)

Prevalence Index = B/A = 3.19

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- ____ Prevalence index is ≤3.0*
- ____ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Additional herbaceous species observed: Alliaria petiolata, Thalictrum dioicum, Sanguinaria canadensis

Note: This data sheet has been adapted to use the 2018 National Wetland Plant List:
U.S. Army Corps of Engineers 2018. National Wetland Plant List, version 3.4

SOIL

Sampling Point: SP2U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-3	10YR 3/3	100					Silt Loam	
3-11	10YR 3/4	100					Silt Loam	
11-15	10YR 3/6	100					Silt Loam	
15-22+	10YR 4/4	100					Silt Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Field Visit Date: May 4, 2021

		Long-term rainfall records							
	Month	**3 yrs. in 10 less than**	**Normal**	**3 yrs. in 10 more than**	**Rain fall**	**Condition: dry, wet, normal**	**Condition value**	**Month weight value**	**Product of previous two columns**
1st prior month*	April	2.56	3.72	4.44	0.62	1	Dry	**3**	3
2nd prior month*	March	0.92	1.77	2.16	1.86	2	Normal	**2**	4
3rd prior month*	February	0.51	1.02	1.23	0.79	2	Normal	**1**	2
								Sum	9

* Compared to field date

**Monthly data prior to field date

"Drier than Normal"

Note: If sum is

6-9	then prior period has been drier than normal
10-14	then prior period has been normal
15-18	then prior period has been wetter than normal

Condition va	=1
Dry	=2
Normal	=3
Wet	

Monthly Data between Specific Months
VIROQUA (WI)
USC00478827

To sort multiple columns, hold SHIFT while clicking on the columns.

Monthly Sum/Averages

Date	Precipitation (in)	Snowfall (in)	Avg. Max Temp (°F)	Avg. Min Temp (°F)	Avg. Mean Temp (°F)
Feb-2021	0.79	9.0	18.0	1.1	9.6
Mar-2021	1.86	3.4	47.5	28.4	38.0
Apr-2021	0.62	0.0	55.4	35.3	45.3
May-2021	M	M	M	M	M
Sum:	3.27	12.4			
Count:	3	3	3	3	3
Average:	1.09	4.1	40.3	21.6	31.0
Median:	0.79	3.4	47.5	28.4	38.0
Low Value:	0.62	0.0	18.0	1.1	9.6
High Value:	1.86	9.0	55.4	35.3	45.3

M = Missing

T = Trace

Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 5/6/2021 3:49:22 PM CDT

WETS Station: VIROQUA, WI

Requested years: 1971 - 2020

Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	23.6	5.5	14.6	0.96	0.6	1.16	3	10.9
Feb	28.9	9.7	19.3	1.02	0.51	1.23	3	8.8
Mar	41.3	21.9	31.6	1.77	0.92	2.16	4	6.5
Apr	56.1	33.4	44.8	3.72	2.56	4.44	7	3.1
May	67.8	44.9	56.4	4.16	2.76	4.98	8	0
Jun	76.7	54.6	65.7	4.79	3.05	5.78	7	0
Jul	80.8	59	69.9	4.55	3.01	5.46	7	0
Aug	78.6	56.9	67.7	4.6	2.65	5.6	7	0
Sep	70.7	48.4	59.5	3.73	2.02	4.56	6	0
Oct	57.9	36.7	47.3	2.5	1.64	3.01	5	0.4
Nov	42	24.8	33.4	1.95	1.09	2.37	4	4.1
Dec	28.2	12.1	20.1	1.54	0.74	1.88	4	10.2
Annual:					31.23	39.5		
Average	54.4	34	44.2	-	-	-	-	-
Total	-	-	-	35.3			65	44.1

GROWING SEASON DATES

Years with missing data:	24 deg = 6	28 deg = 6	32 deg = 5
Years with no occurrence:	24 deg = 0	28 deg = 0	32 deg = 0
Data years used:	24 deg = 44	28 deg = 44	32 deg = 45
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	4/14 to 10/20: 189 days	4/29 to 10/9: 163 days	5/7 to 9/30: 146 days
70 percent *	4/9 to 10/25: 199 days	4/24 to 10/14: 173 days	5/2 to 10/6: 157 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

Creation date: 2016-07-22

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Appendix C

ISR Checklist

Initial Site Report Completeness Checklist
Chapter NR 509, Wis. Adm. Code

Revised January 2018

Waste & Materials Management
P.O. Box 7921
Madison, WI 53707-7921

Instructions: This checklist is intended for use by department staff for the review of landfill initial site reports to determine completeness. The checklist may also be used by applicants and submitted with a landfill initial site report to facilitate department review. Refer to applicable statues and codes for exact requirements.

General Information

Facility Name: Vernon County Landfill - Proposed Vertical and Horizontal Expansion

Facility Type: MSW Landfill

Initial Submittal: Date Received: ____/____/____ Completeness Due: ____/____/____ DNR Response: ____/____/____ (Complete: __ yes __ no)

Addendum # __ Date Received: ____/____/____ Completeness Due: ____/____/____ DNR Response: ____/____/____ (Complete: __ yes __ no)

Addendum # __ Date Received: ____/____/____ Completeness Due: ____/____/____ DNR Response: ____/____/____ (Complete: __ yes __ no)

Proposed Waste Types: MSW, C&D, Special Waste, Industrial

Proposed Total Design Capacity: 450,000 CY (including daily and intermediate covers)

Y	N	Have office and work copies been designated?
Y	N	Has each copy been stamped with the date received?
Y	N	Has the initial submittal been entered into the FIST database?
Y	N	Have all additional information submittals been entered into FIST database?
Y	N	Have the acknowledgment letter and invoice been sent to the applicant? (if yes, date sent: ____/____/____)
Y	N	Has the invoiced plan review fee been paid? (if yes, date received: ____/____/_____)

Facility Name: _____

				LOCATION	COMMENTS
Has the department completed an initial site inspection? Date of inspection: 09/30/2021 Date of ISI letter: 11/01/2021	X			Appendix A	Site inspection also conducted on 11/18/2020 and ISI letter issued 12/15/2020
(1) Has the review fee specified in s. 520.04 been submitted? Note: The department sends an invoice for the plan review fee to the applicant upon receipt of the report. The applicant must send payment to the department within 30 days after receipt of the invoice.				Section 1.3.1	
(2) Has a cover letter detailing desired action been submitted?	X			Cover Letter	
(3) Have 3 paper copies been submitted to the regional office (and 1 additional paper and electronic copy submitted to the bureau office, unless otherwise specified by the department)?	X				See Distribution List in TOC
(4) Are the report and plan sheets submitted under seal of P.E. and P.G.?	X				
Note: Subsections (5), (6), (7), and (8) below are typically not applicable unless information from ch. NR 510 is included in the ISR.					
(5) TECHNICAL PROCEDURES:			X		
Were all test procedures specified in the report?					
Were all technical procedures used to investigate the facility considered current standard procedures (ASTM, USGS, etc.)? __ yes __ no If no, was explanation and reasoning provided for any deviation from a standard method? __ yes __ no					
(6) VISUALS: Do all maps, plan sheets, drawings, isometrics, cross-sections, and aerial photographs meet the following requirements:					
(a) No larger than 24 inches by 36 inches and no smaller than 8-1/2 x 11 inches?					
(b) Appropriate scale to show required detail?					
(c) Do the visuals meet the following requirements? __ numbered __ legends for all symbols __ referenced in the narrative __ horizontal/vertical scales __ titled __ drafting or origination dates					
(d) Were uniform scales used?					
(e) Were north arrows provided?					
(f) Was a USGS datum used as a basis for all elevations?					
(g) Do visuals contain a survey grid based on monuments established in the field that are referenced to state plane coordinates?					

Facility Name: _____

COMPLETENESS REQUIREMENTS	COMPLETE? Y	N	NA	LOCATION	COMMENTS
(h) Are the original topography and a grid system contained on the plan sheets that show construction, operation or closure topography?					
(i) Do the cross-sections meet the following requirements? ___ show survey grid locations ___ reference major plan sheets ___ provide a reduced diagram of a cross-section location map (plan view)					
(7) Was a table of contents provided listing all sections of the submittal?					
(8) Was an appendix provided listing names of all references, all raw data, testing and sampling procedures and calculations?					
NR 509.05(2) Is the department's initial site inspection evaluation and all pertinent information submitted for the initial site inspection included in the report?					
NR 509.05(3) Content - The ISR shall identify the following:					
(a) Project title	X			Cover Page	
(b) Name, address & phone number of primary contacts, including the landfill's owner, operator and any consultants	X			Section 2.1.1	
(c) Present property owner	X			Section 2.1.1	
(d) Proposed facility owner & operator	X			Section 2.1.1	
(e) Proposed landfill location (by ¼-¼ section)	X			Section 2.1	
(f) Total acreage of property and anticipated limits of filling	X			Sections 1.2 and 2.1	
(g) Proposed landfill life and design capacity	X			Section 2.2	
(h) Municipalities and industries to be served	X			Section 2.3	
(i) Anticipated waste types and characteristics:	X			Section 2.4	
(j) Anticipated volumes of each major waste stream and any seasonal fluctuations taking into account waste reduction, reuse, recycling, composting and the recovery of energy from solid waste	X			Section 2.4	
(k) Anticipated cover frequency	X			Section 2.5	
(l) Mode of operation	X			Section 2.6	
(m) Anticipated sub-base, base and final grades				Section 2.7	
NR 509.06 LAND USE INFORMATION - At a minimum, the land uses in the area within one mile of the anticipated limits of filling must be discussed in the report.					
Must discuss: __X__ land uses which may have an impact on the suitability of the property for waste disposal __X__ land uses which may have an impact on groundwater quality __X__ address all areas where land use may affect or be affected by the proposed landfill	X			Section 3.2 Section 3.3 Section 3.4	

Facility Name: _____

COMPLETENESS REQUIREMENTS	COMPLETE? Y	N	NA	L	
(1) Does the report locate and identify all adjacent landowners whose property is contiguous to the proposed landfill's property boundaries and all residences within 1,200 feet of the anticipated limits of filling (may be presented on a plat map if it clearly and accurately shows current land ownership conditions).	X			Section 3.5, Appendix E Table 1, Fig 2	
(2) Does the report include a discussion of land use zoning. Note areas zoned as floodplain, conservancy, shoreland, or wetland.	X			Section 3.6	
Are zoning variances required? __ yes _X_ no	X			Section 3.6	
If required, has an agricultural impact statement (AIS) been completed? __ yes _X_ no Note: An AIS is required if a municipality or utility will need agricultural lands and have not yet purchased or obtained an option to purchase the land.	X			Section 3.6	
(3) Does the report include a description of present land uses including known recreational, historical, archaeological, critical habitat areas, county forest lands and state or local natural areas.	X			Section 3.1 Section 3.7	
(4) Does the report include all initial communications from FAA concerning any airports within five miles of the anticipated limits of filling if landfill owner proposes to accept municipal solid waste or other putrescible waste.	X			Section 3.8 Appendix F	
(4) Does the report discuss existing or proposed transportation routes and access roads (including any weight restrictions).	X			Section 3.9	
NR 509.07 REGIONAL GEOTECHNICAL INFORMATION - Information may be limited to available publications. At a minimum, the regional setting within one mile of the anticipated limits of filling must be discussed, and when available, supplemented with maps of regional bedrock and glacial geology, along with USGS topographical maps, NRCS soil maps and regional water table maps.					
(1) Topography (the existing topography including predominant topographic features)	X			Section 4.1	
(2) Hydrology (surface water drainage patterns and significant hydrologic features, including surface waters, springs, surface water drainage basins, divides, and wetlands)	X			Section 4.2	
(3) Geology (origin, nature and distribution of bedrock; origin, texture, thickness and distribution of the unconsolidated units; and texture and classification of surficial soils)	X			Section 4.3	
(4) Hydrogeology: __ depth to groundwater __ aquifer(s) __ groundwater flow directions __ principal aquifers used by water supply wells __ groundwater divides	X			Section 4.4	
(5) Water quality (information on groundwater and surface water quality available from the USGS, WSGNHS, DNR, UW-Extension, and regional planning commissions)	X			Section 4.5	

Facility Name: _____

Legal Note: This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

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Appendix D

Tonnage Report

2020 Wisconsin Municipal and Industrial Waste Landfill Tonnages

Facility Name	WDNR Lic. No.	Landfill type (MSW or Industrial)	County	Waste Category (tons)[1]																	Waste Imported to Wisconsin from Out of State (tons)[3]							Capacity and Site Life			
				Municipal waste - Cat. 1	Utility ash - Cat. 2	Papermill sludge / ash - Cat. 3	Foundry waste - Cat. 4	POTW sludge - Cat. 5	Other solid waste - Non-MSW/ Non-HW - Cat. 6	Waste used for ADC/other - Cat. 19	Incin-erator ash - Cat. 20	Industrial waste used for ADC/other - Cat. 21	Shredder fluff used for ADC/other - Cat. 22	Treated contam-inated soil used for ADC/other - Cat. 23	Unusable paper-making materials - Cat. 24	Construct-ion & Demo. Waste - Cat. 25	Sediment Contam-inated w/PCBs - Cat. 26	Waste from a Non-profit - Cat. 27	Waste from a Natural Disaster - Cat. 28	Waste removed at DNR request - Cat. 29	QMRF residue (Recyc.) - Cat. 30	QMRF residue (C&D) - Cat. 31	Total (Cat 1-31)	IL[2]	IN[2]	IA[2]	MN[2]	MI[2]	Other[2]	Cap. As of Jan. 2020 in Cu Yds[4]	Cap. as of Jan. 2021 In Cu Yds [5 or 6]	Estimated Disposal Capacity consumed in 2020 (Cu Yds)	Estimated Remaining Site Life In Years[7]
KESTREL HAWK LF	572	MSW	Racine	105,341	0	0	0	0	57,229	93	0	7,739	0	0	0	0	0	1,926	0	0	0	1,127	173,455	85	0	0	0	0	0	96,293	451,000	281,290[5]	2
WMWI - METRO RECYCLING & DISPOSAL	1099	MSW	Milwaukee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOMTAR AW LLC ASH BARK SITE	1365	Industrial	Wood	0	0	0	0	0	826	0	0	0	0	0	0	0	0	0	0	0	0	0	826	0	0	0	0	0	0	427,506	426,477	1,029[5]	0
KOHLER CO LF	1508	Industrial	Sheboygan	0	0	0	16,953	628	991	0	0	0	0	0	0	0	0	0	0	0	0	0	18,572	0	0	0	0	0	0	13,908	118,056	13,757[5]	9
WATER RENEWAL CENTER LANDFILL	1686	Industrial	Portage	0	0	6,910	0	0	0	805	0	870	0	0	0	0	0	0	0	0	0	0	8,585	0	0	0	0	0	0	414,206	404,395	9,811[6]	33
CHEMTRADE SOLUTIONS LLC	1907	Industrial	Winnebago	0	0	0	0	0	95	0	0	0	0	0	0	0	0	0	0	0	0	0	95	0	0	0	0	0	0	36,107	36,012	86[6]	15
WPL-COLUMBIA ENERGY CENTER	2325	Industrial	Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G-P CONSUMER OPERATIONS LLC GB WEST LF	2332	Industrial	Brown	0	0	37,720	0	0	0	5,599	0	13,388	0	0	0	0	0	0	0	0	0	0	56,707	0	0	0	0	0	0	2,200,179	2,165,991	73,900[5]	26
WATER QUALITY CENTER LF	2488	Industrial	Wood	0	7,691	29,103	0	0	4,686	0	0	23,455	0	0	0	30	0	0	0	0	0	0	64,966	0	0	0	0	0	0	2,856,989	2,791,603	65,386[6]	NR[7]
DOMTAR AW LLC WASTEWATER TREATMENT LF	2613	Industrial	Wood	0	0	2,904	0	0	10,505	600	0	0	0	0	0	0	0	0	0	0	0	0	14,009	0	0	0	0	0	0	594,025	575,150	18,875[6]	1
SUPERIOR CTY MOCCASIN MIKE LF	2627	MSW	Douglas	116,919	0	0	0	2,547	2,347	1,683	0	0	0	0	0	7,693	0	26	0	0	0	0	131,215	0	0	0	104,336	0	0	772,995	623,151	149,844[7]	5
WEPCO PLEASANT PRAIRIE LF	2786	Industrial	Kenosha	0	12,281	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12,281	0	0	0	0	0	0	3,995,878	3,985,644	10,234[6]	2
AHLSTROM-MUNKSJÖ MOSINEE LLC	2806	Industrial	Marathon	0	1,767	2,613	0	0	6,065	0	0	0	0	0	0	0	0	0	0	0	0	0	10,445	0	0	0	0	0	0	8,500	9,094	11,334[6]	1
WPL - EDGEWATER GENERATING STATION	2853	Industrial	Sheboygan	0	12,005	0	0	0	0	0	0	0	0	0	0	3,445	0	0	0	0	0	0	15,450	0	0	0	0	0	0	820,923	805,407	15,516[5]	54
GEORGIA PACIFIC CONSUMER OPERATIONS LLC	2893	Industrial	Brown	0	0	5,384	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,384	0	0	0	0	0	0	127,459	120,659	6,800[7]	17
ADVANCED DISP SERV CRANBERRY CREEK LF LLC	2967	MSW	Wood	142,981	24	0	576	704	20,424	0	0	22,234	9,411	9,199	2,164	11,678	0	0	0	0	1,976	0	221,372	0	0	66	0	0	0	2,307,622	2,057,749	249,873[5]	NR[7]
GREDE LLC - REEDSBURG	2974	Industrial	Sauk	0	0	0	8,560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,560	0	0	0	0	0	0	106,085	99,500	6,585	7
DANE CNTY LF #2 RODEFELD	3018	MSW	Dane	182,532	0	0	0	2,595	1,206	23,507	0	0	0	0	0	8,922	0	0	0	0	5,897	13,997	238,656	0	0	0	0	0	0	2,457,921	2,165,941	291,980[5]	8
WPL- COLUMBIA ENERGY CENTER	3025	Industrial	Columbia	0	86,168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86,168	0	0	0	0	0	0	5,256,344	5,184,538	71,806[6]	29
LOKI FIONTAR LLC	3036	Industrial	Outagamie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50,000	50,000	0	NR[7]
WMWI - VALLEY TRAIL RECYCLING & DISPOSAL	3066	MSW	Green Lake	96,608	0	4,881	12,097	0	49,878	7,708	0	43,602	0	9,384	633	2,176	0	498	0	0	0	0	227,465	0	0	0	0	0	0	3,999,271	3,883,725	115,546[8]	17
WIS PUBLIC SERV CORP WESTON ASH DISP SITE #3	3067	Industrial	Marathon	0	50,150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50,150	0	0	0	0	0	0	3,725,658	3,683,866	41,792[6]	15
GLACIER RIDGE LANDFILL LLC	3068	MSW	Dodge	420,059	0	0	21,503	5,120	25,493	1,705	0	95,936	33,466	3,984	0	31,616	0	8,997	0	0	1,691	0	649,570	0	0	625	0	0	0	4,388,437	6,123,385[9]	965,052[6]	NR[7]
SHAWANO CTY PHASE 2 LF	3069	MSW	Shawano	412	0	0	12,112	0	217	0	0	0	0	0	0	74	0	0	0	0	0	0	12,815	0	0	0	0	0	0	39,717	29,971	9,746[7]	3
MAR-OCO LF	3095	MSW	Marinette	15,666	0	0	0	0	0	4,179	0	0	0	0	0	0	0	0	0	0	0	0	19,845	0	0	0	0	0	0	442,109	409,313	32,796[6]	12
SEVEN MILE CREEK LANDFILL LLC	3097	MSW	Eau Claire	226,925	320	777	443	0	17,359	1,346	0	11,856	53,241	914	0	31,749	0	0	0	0	0	0	344,930	0	0	391	71,649	0	0	1,470,000	1,160,000	550,927[6]	2
HWY G SANITARY LF	3100	MSW	Vilas	21,260	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,507	0	24,767	0	0	0	0	645	0	244,613	230,000	14,613[7]	7
PACKAGING CORP OF AMERICA - TOMAHAWK LF	3114	Industrial	Lincoln	0	19,345	6,644	0	391	510	0	0	0	0	0	0	0	0	0	0	0	0	0	26,890	0	0	0	0	0	0	1,334,622	1,297,014	37,608[7]	35
DAIRYLAND POWER COOP - CASSVILLE	3122	Industrial	Grant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60,000	60,000	0	0
HICKORY MEADOWS LANDFILL LLC	3134	MSW	Calumet	188,565	0	37,920	7,261	384	74,124	0	0	14,632	25,695	5,906	62,212	32,387	8,566	593	0	0	0	0	458,245	0	0	0	0	248	0	6,925,106	5,609,183	1,315,923[6]	NR[7]
LINCOLN CNTY SANITARY LF	3141	MSW	Lincoln	40,238	0	80	0	0	372	752	0	0	0	4,601	0	0	0	0	0	0	0	0	46,043	0	0	0	0	0	0	1,037,912	988,257	49,655[7]	16
ADAMS CNTY LF & RECYCLING CENTER	3150	MSW	Adams	40,164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	502	0	40,666	0	0	0	0	0	0	591,258	548,452	42,806[7]	10
DEER TRACK PARK LANDFILL	3230	MSW	Jefferson	143,577	0	0	324	0	25,712	31,086	0	3,264	8,544	8,621	1,860	4,172	0	0	0	0	1,385	550	229,095	0	0	3,409	0	0	0	3,540,483	3,319,839	220,644[8]	13
WEPCO CALEDONIA LF	3232	Industrial	Racine	0	7,460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,460	0	0	0	0	0	0	2,409,055	2,402,838	6,217[8]	15
NORTHERN STATES POWER CO - WOODFIELD ASH LF	3233	Industrial	Bayfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	131,378	131,378	0	0
OUTAGAMIE CNTY NE LF (AREA 6)	3235	MSW	Outagamie	482,791	0	100	0	5,069	2,924	34,141	4,136	36,992	36,728	9,255	14,470	49,231	0	13	0	0	8,978	0	684,828	0	0	0	0	0	0	2,645,836	1,950,503	695,333[8]	3
MALLARD RIDGE LANDFILL INC	3244	MSW	Walworth	115,081	0	0	0	0	35,144	16,720	0	8,728	20,262	13	0	36,469	0	2,210	0	0	2,634	0	237,260	21,254	0	0	0	0	0	1,659,734	1,332,937	326,797[6]	3
RED HILLS LANDFILL - PHASES 5 & 6	3251	Industrial	Outagamie	0	0	65,943	0	0	228	0	0	27,910	0	0	0	0	0	0	0	0	0	0	94,081	0	0	0	0	0	0	4,872,233	4,632,000	240,233[8]	18
LA CROSSE CNTY LF MSW & ASH MONOFILL	3253	MSW	La Crosse	60,880	283	0	0	502	2,148	6,909	9,520	5,676	0	234	0	29,565	0	380	0	0	2	0	116,099	0	0	246	19,512	0	0	1,836,427	1,701,269	161,477[7]	12
VERNON CNTY SOLID WASTE/RECYCLING FACILITY	3268	MSW	Vernon	19,817	0	0	0	0	0	0	0	0	0	0	0	1,119	0	0	0	0	0	0	20,937	0	0	0	0	0	0	97,681	69,950	27,731[7]	3
GEORGIA PACIFIC NORTH LF	3275	Industrial	Winnebago	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,317,200	10,317,200	0	15
EMERALD PARK LANDFILL LLC	3290	MSW	Waukesha	227,052	0	14,857	2,319	1,367	28,735	102,531	0	14,809	14,472	2,921	0	77,088	0	3,311	0	0	112	0	489,574	0	0	0	0	0	0	5,150,669	4,430,310	720,359[6]	6
W M W I - MADISON PRAIRIE LF	3318	Industrial	Dane	0	216	0	794	0	28,292	16,990	0	0	115	0	0	25,946	0	0	0	0	0	22,314	94,667	0	0	0	0	0	0	913,440	837,136	76,304[8]	9
MARATHON CNTY AREA B LF	3338	MSW	Marathon	0	0	0	0	0	0	938	0	0	0	0	0	1,059	0	0	0	0	0	0	1,997	0	0	0	0	0	0	186,568	184,021	2,547[6]	2
WMWI-ORCHARD RIDGE RECYCLING & DISPOSAL	3360	MSW	Waukesha	0	0	0	0	0	0	0	0	0	0	42,486	0	0	0	0	0	0	0	0	42,486	0	0	3	0	0	0	50,000	81,500	NR[10]	1
WAUPACA FOUNDRY INC LF #3	3412	Industrial	Waupaca	0	0	0	48,893	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48,893	0	0	0	0	0	0	929,274	893,057	36,217[8]	10
WMWI- TIMBERLINE TRAIL RECYCLING & DISPOSAL	3455	MSW	Rusk	83,198	2,974	0	0	0	4,760	905	0	978	0	262	1,577	887	0	673	0	0	0	0	96,213	0	0	0	25	0	0	4,242,318	4,000,291	242,027[8]	15
HARRISON LANDFILL	3458	Industrial	Calumet	0	0	39,305	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39,305	0	0	0	0	0	0	117,875	55,486	62,389[7]	1
BFI WASTE SYSTEMS OF NORTH AMERICA LLC	3474	MSW	Washburn	176,822	1,886	0	0	0	15,683	0	17,320	0	0	126	0	2,294	0	0	0	0	0	0	214,131	0	0	0	72,163	0	0	5,707,624	5,492,259	215,365[8]	32
MONROE CNTY RIDGEVILLE II SAN LF	3660	MSW	Monroe	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	NR[2]	85,901	NR[2]	NR[2]	NR[7]
WMWI - PHEASANT RUN RECYCLING & DISPOSAL	3765	MSW	Kenosha	97,426	0	0	76	9,113	15,387	33,615	0	461	19,180	2,628	59	16,930	0	148	0	0	0	0	195,023	5,568	0	0	0	0	0	9,040,800	8,840,000	200,800[8]	NR[7]
JANESVILLE CTY LF (NEW)	3939	MSW	Rock	144,025	0	0	0	1,487	1,987	0	0	2,229	36,920	0	0	22,994	0	0	0	1,304	13,852	0	224,798	36,920	0	0	0	0	0	5,195,237	4,941,340	253,897[7]	20
DAIRYLAND POWER COOP PHASE IV - BELVIDERE	4126	Industrial	Buffalo	0	36,650	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36,650	0	0	0	0	0	0	1,897,013	1,853,033	43,980	NR[7]
MARATHON CNTY BLUE BIRD RIDGE RDF	4228	MSW	Marathon	190,537	1,551	6,670	0	577	9,279	17,733	0	23,948	0	0	0	15,608	0	15	0	0	0	0	265,918	0	0	0	0	0	0	1,232,038	828,081	403,957[6]	2
WMWI -RIDGEVIEW RECYCLING & DISPOSAL - SOUTH	4292	MSW	Manitowoc	155,237	23,173	0	3,485	290	72,148	113,103	0	22,480	0	0	24,169	1,158	18	4,851	0	0	3,036	0	423,148	0	0	0	0	437	0	7,214,819	6,852,716	362,103[8]	12
WMWI-ORCHARD RIDGE RECYCLING & DISPOSAL	4491	MSW	Waukesha	384,692	0	0	507	0	130,478	171,529	0	20,229	0	0	0	10,824	0	1,111	0	0	18,208	6,892	744,469	1,913	0	305	74	175	53	5,300,000	4,469,000	831,000[8]	5
WMWI - METRO RECYCLING & DISPOSAL	4579	MSW	Milwaukee	471,443	0	0	5,932	610	89,054	67,384	0	8,078	0	5,884	0	8,387	0	120	0	0	7,647	14,488	679,028	228	0	0	0	0	0	8,970,800	8,116,000	854,000[8]	9
			Totals	**4,350,249**	**263,944**	**261,809**	**141,835**	**31,383**	**734,286**	**661,561**	**30,976**	**409,495**	**258,033**	**106,418**	**107,145**	**433,501**	**8,584**	**24,871**	**0**	**1,304**	**69,427**	**59,368**	**7,954,191**	**65,969**	**0**	**5,044**	**267,760**	**1,505**	**53**				

Footnotes:

[1] Waste categories are defined in the Environmental Fees table on the DNR website at https://dnr.wi.gov/topic/Landfills/documents/environmentalfeesummary.pdf

[2] NR = not reported at the time of posting.

[3] Out of State tonnage is already inlcuded in the category and total tonnages.

[4] As reported by the landfill on the Calendar Year 2019 or 2020 Waste Disposal Tonnage/Capacity Certification Report.

[5] As reported by the landfill. Calculated based on a topographical survey.

[6] As reported by the landfill. Calculated using standard conversion factors.

[7] As calculated and reported by the landfill. Methods vary.

[8] Calculated using the Jan. 2020 and Jan 2021 capacity reported by the landfill.

[9] Landfill capacity increased due to an approved expansion.

[10] NR = not reported, landfill reported a survey was used to estimate Jan. 2021 Capacity remaining

Last updated: April 2021

KEY	
Category 1: Municipal Waste	**Category 23:** Treated Contaminated Soil used for daily cover
Category 2: Utility Ash/Sludges	**Category 24:** Exempt Unusable Paper Making Materials
Category 3: Pulp/Papermill Mfg waste	**Category 25:** Construction & Demolition (C&D) Waste
Category 4: Foundry Waste	**Category 26:** Sediments Contaminated with PCBs
Category 5: POTW Sludges	**Category 27:** Waste Generated by a Non-Profit Org
Category 6: All other SW (not HW)	**Category 28:** Waste Generated by Natural Disaster
Category 19: Fee Exempt waste used for dikes, berms, etc	**Category 29:** Waste Removed at Request of DNR to Mitigate Potential Env Impacts
Category 20: Energy Recovery Incinerator Ash	**Category 30:** MRF Residuals – 10% cap
Category 21: High Volume Industrial used for daily cover,etc	**Category 31:** MFR Residuals – 30% cap
Category 22: Shredder Fluff used for daily cover	

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Appendix E

Visuals

Table 1

Adjacent Land Owners

MAP ID	PARCEL ID	OWNER	OWNER 2	POSTAL ADDRESS	SITE ADDRESS
1	036-00411-0000	RANDY D & KAREN M CRUME		E8284 SEAS BRANCH RD, VIROQUA, WI, 54665	
2	036-00393-0000	RANDY D & KAREN M CRUME		E8284 SEAS BRANCH RD, VIROQUA, WI, 54665	E8284 SEAS BRANCH RD
3	036-00410-0000	ALVIN L WOODMANSEE	C/O SUSAN WOODMANSEE	201 N WALBRIDGE AVE 111, MADISON, WI, 53714	
4	036-00408-0000	PAULINE A BUCKLAND		PO BOX 174, VIROQUA, WI, 54665	
5	036-00379-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
6	036-00381-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
7	036-00674-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
8	036-00638-0000	MADELINE CLEMENTS	STEVEN & DEBRA CLARK	210 N WASHINGTON, VIROQUA, WI, 54665	E8454 N ASBURY RD
9	036-00637-0000	WISCONSIN RSA #8	LIMITED PARTNERSHIP	8410 W BRYN MAWR AVE, CHICAGO, IL, 60631	
10	036-00635-0000	ZION CHURCH			
11	036-00645-0000	JEROME J & SHARON M BUTERA		E8449 N ASBURY RD, VIROQUA, WI, 54665	E8449 N ASBURY RD
12	036-00644-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
13	036-00642-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD, COON VALLEY, WI, 54623	
14	036-00643-0000	JOHN & LINDA KIELER REVOCABLE TRUST		748 COUNTY RD Z, HAZEL GREEN, WI, 53811	
15	036-00641-0000	ROBERT J & TAMMY L MENNE		E8327 N ASBURY RD, VIROQUA, WI, 54665	E8327 N ASBURY RD
16	036-00652-0000	JOHN & LINDA KIELER REVOCABLE TRUST		748 COUNTY RD Z, HAZEL GREEN, WI, 53811	
17	036-00647-0000	CHAD B WILLIAMS		E7541 COUNTY RD SS, VIROQUA, WI, 54665	E8263 N ASBURY RD
18	036-00650-0000	JOHN & LINDA KIELER REVOCABLE TRUST		748 COUNTY RD Z, HAZEL GREEN, WI, 53811	
19	036-00649-0001	WAYNE K KRUIZENGA	JULIE KRUIZENGA	E8107 COUNTY RD LF, VIROQUA, WI, 54665	
20	036-00406-0000	ALICE MAE NELSON		E8137 COUNTY RD Y, VIROQUA, WI, 54665	
21	036-00405-0000	ALICE MAE NELSON		E8137 COUNTY RD Y, VIROQUA, WI, 54665	E8137 COUNTY ROAD Y
22	036-00404-0000	GRACE ACRES LLC		E8219 COUNTY RD Y, VIROQUA, WI, 54665	
23	036-00402-0000	GRACE ACRES LLC		E8219 COUNTY RD Y, VIROQUA, WI, 54665	E8219 COUNTY ROAD Y

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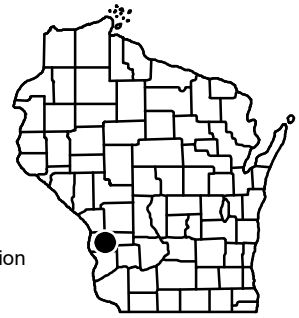
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TOWNSHIP: 13
RANGE: 4
SECTION: 15 & 22



Legend

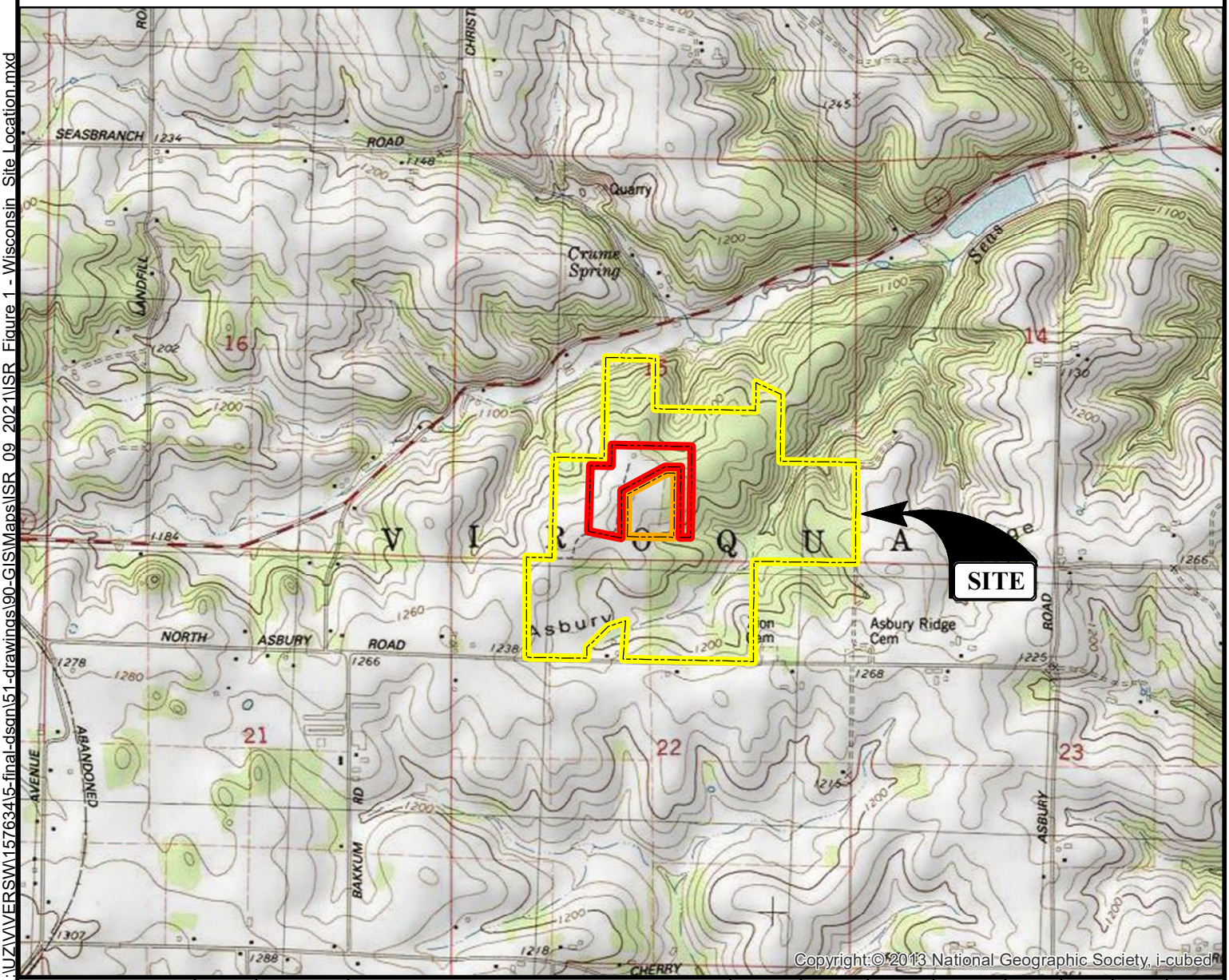
- Landfill Property Boundary
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Landfill Expansion

N
W E
S

0 1,000 2,000 Feet

1 inch = 2,000 feet

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NO.	DATE	ISSUES/REVISIONS	DRAWN BY		DESIGN		FIELD REVIEW		QC CHECK	
1	10/22/2020	ISI REQUEST	RJH	10/20	RJH	10/20			BLK	10/20

SEH

INITIAL SITE REPORT
VERNON COUNTY LANDFILL
(WIDNR LICENSE NO.3268)

FIGURE 1
SITE LOCATION

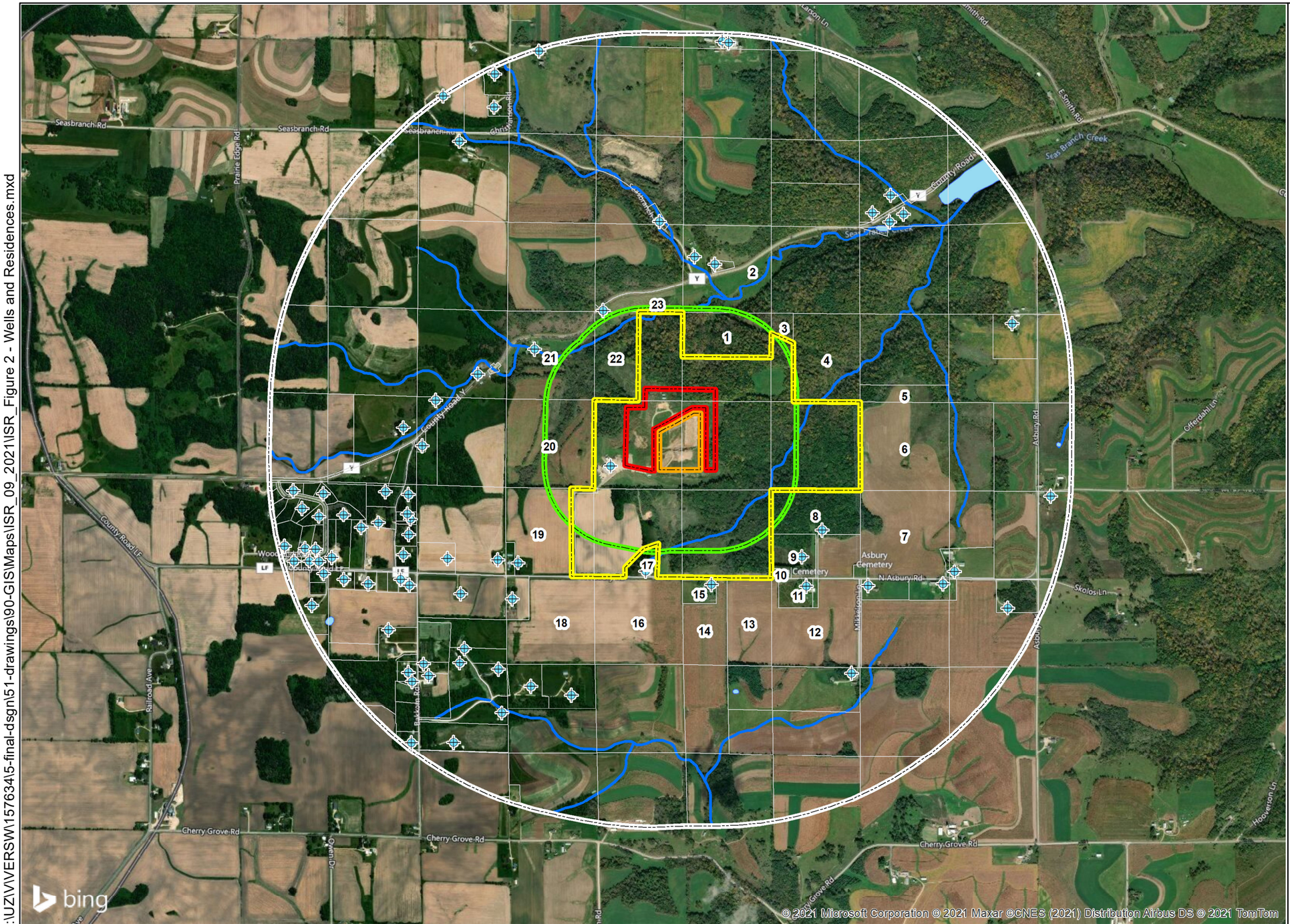
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DATE 09/23/2021

Figure 1

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Document Path: X:\UZI\VERSW\157634\5-final-dsgn\51-drawings\90-GIS\Maps\ISR_09_2021\ISR_Figure 2 - Wells and Residences.mxd



Legend

- Landfill Property Boundary
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Landfill Expansion
- Parcels within 1 Mile
- Private Wells
- Streams
- 1 Mile Buffer
- 1200 Foot Buffer
- Waterbodies

N
W E
S

0 750 1,500 3,000
Feet

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
rjh

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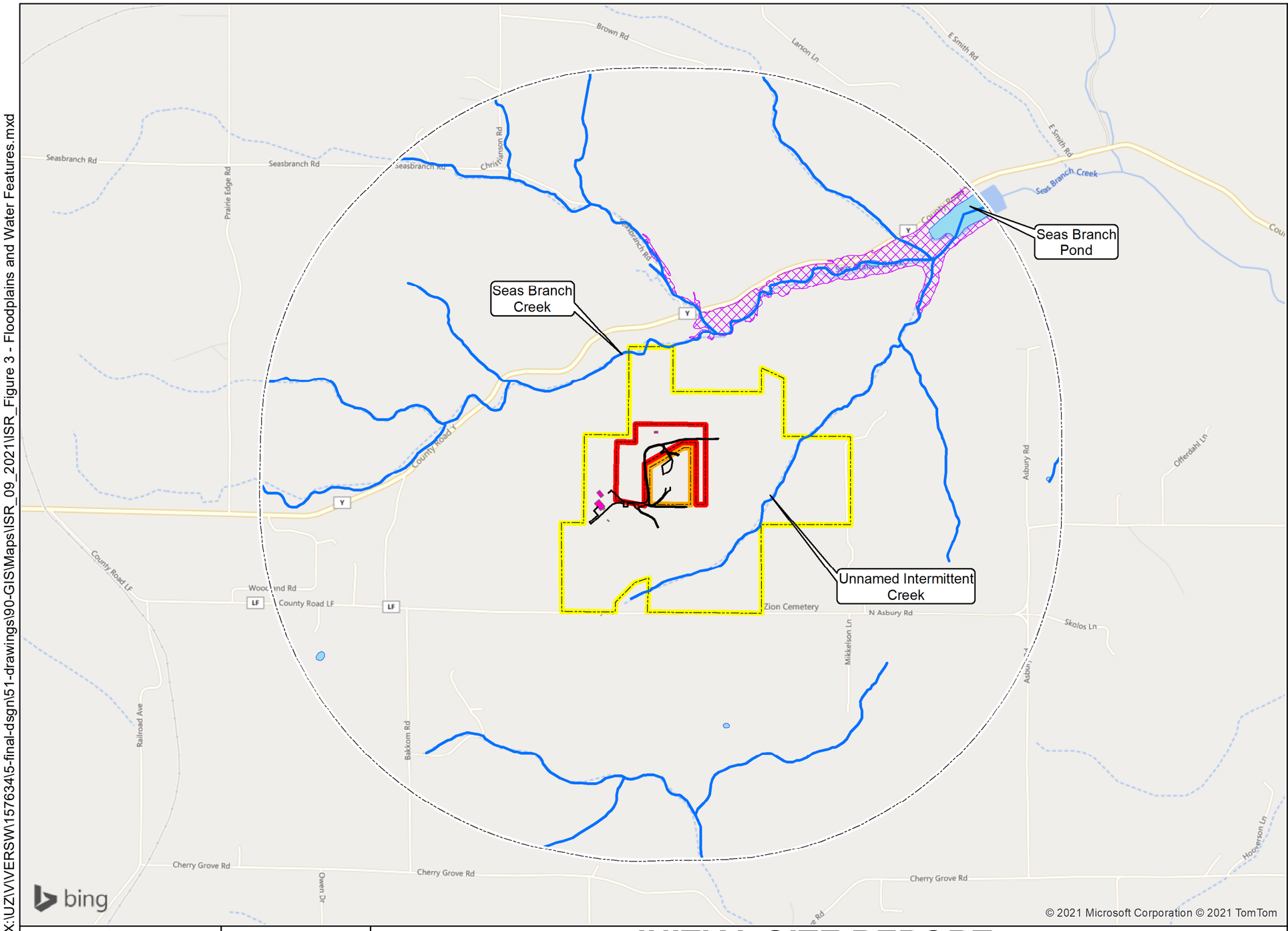
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DATE:
09/23/2021

INITIAL SITE REPORT VERNON COUNTY LANDFILL (WIDNR LICENSE NO.3268)

Residences and Private Wells Within 1 Mile of Proposed Landfill Expansion

Figure 2



Legend

- Landfill Property Boundary
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Landfill Expansion
- 1 Mile Buffer
- Landfill Roads
- Streams
- Waterbodies

Flood Zone

- 1% Chance Annual Flood Hazard

N

W E

S

0 750 1,500 3,000 Feet

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
rjh

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Document Path: X:\UZ\V\VERSW\157634\5-final-dsgn\51-drawings\90-GIS\Maps\ISR_09_2021\ISR_Figure 3 - Floodplains and Water Features.mxd

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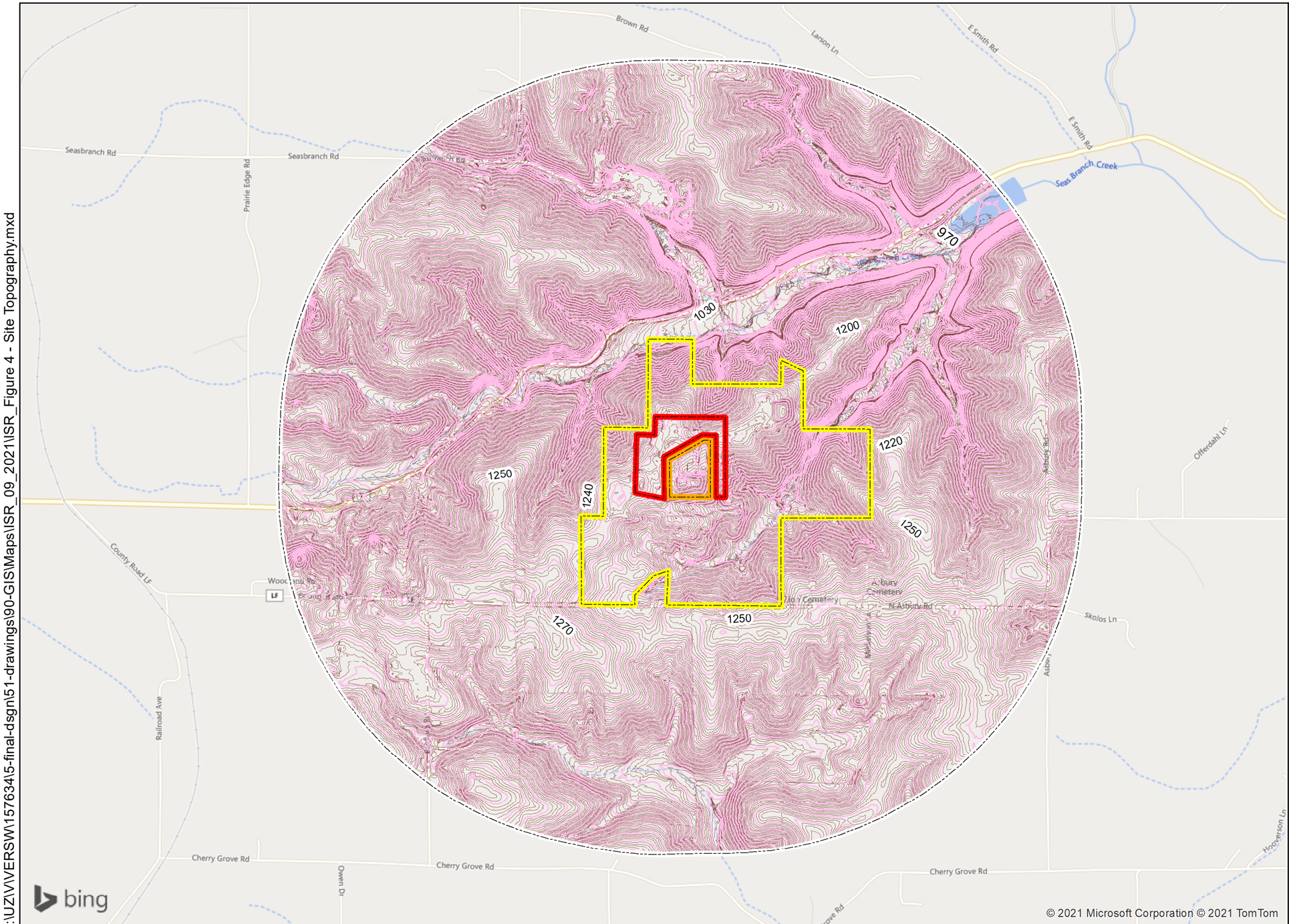
PROJECT: VERSW157634

DATE: 09/24/2021

INITIAL SITE REPORT VERNON COUNTY LANDFILL (WIDNR LICENSE NO.3268)

Floodplains and Water Features Within 1 Mile of Proposed Landfill Expansion

Figure 3



Legend

- 1 Mile Buffer
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Limits of Expansion
- Landfill Property Boundary

Topography

- Major Contours(10' Intervals)
- Minor Contours (2' Intervals)

N
W E
S

0 750 1,500 3,000
Feet

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
rjh

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Document Path: X:\UZ\V\VERSW\157634\5-final-dsgn\51-drawings\90-GISMaps\ISR_09_2021\ISR_Figure 4 - Site Topography.mxd

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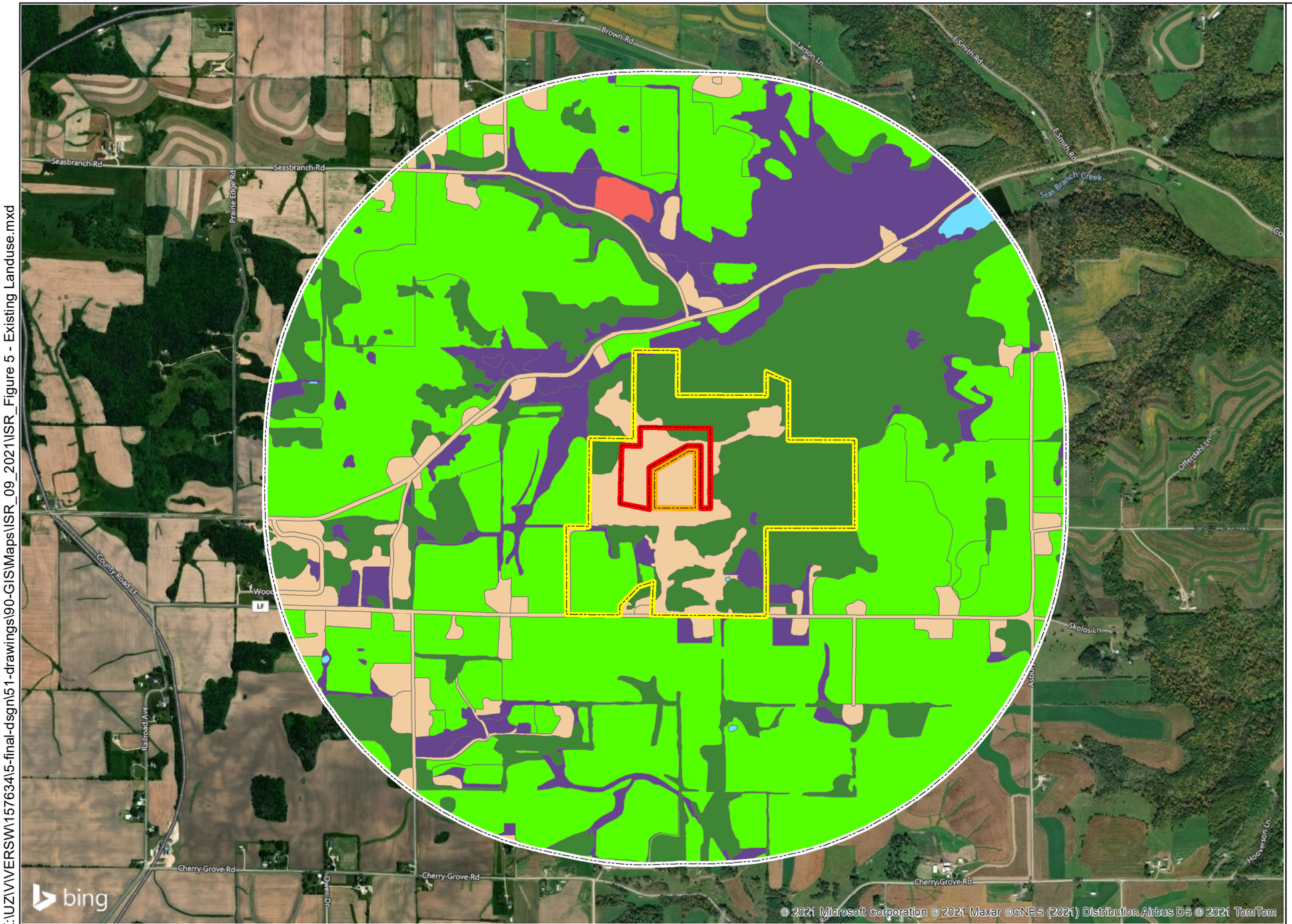
PROJECT:
VERSW157634

DATE:
09/24/21

INITIAL SITE REPORT VERNON COUNTY LANDFILL (WIDNR LICENSE NO.3268)

TopographyWithin 1 Mile of Horizontal Expansion

Figure 4



Legend

- 1 Mile Buffer
- Landfill Property Boundary
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Landfill Expansion

Landuse

- Agriculture
- Barren
- Developed
- Forest
- Grassland
- Open Water

N

W E

S

0 750 1,500 3,000

Feet

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
rjh

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Document Path: X:\UZ\V\VERSW\157634\5-final-dsgn\51-drawings\90-GIS\Maps\ISR_09_2021\ISR_Figure 5 - Existing Landuse.mxd

SEH
10 North Bridge Street
Chippewa Falls, WI 54729
PHONE: (715) 720-6200
FAX: (715) 720-6300
WATTS: 800-472-5881
www.sehinc.com

PROJECT:
VERSW157634

DATE:
09/24/2021

INITIAL SITE REPORT
VERNON COUNTY LANDFILL
(WIDNR LICENSE NO.3268)

Existing Landuse Within 1 Mile of Proposed Landfill Expansion

Figure

5

Appendix F

FAA Correspondence

From: Beauchamp, Bobb (FAA)
To: Brian Kent
Subject: RE: Vernon County Landfill
Date: Friday, March 19, 2021 2:20:11 PM

Mr. Kent,

This email is responding to your October 23, 2020 notification of a proposed horizontal expansion at the Vernon County Landfill. Your notification was to meet provisions and requirements of:

- s. NR504.04(3)(e) Wisconsin Administrative Code
- 40 CFR 258.10 –Airport Safety
- 49 USC Section 44718(d), as amended by Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L No. 106-181 (April 5, 2000)
- FAA Advisory Circular AC No. 150/5200-34A (January 26, 2006) : Construction or Establishment of Landfills Near Public Airports
- FAA Advisory Circular AC No. 150/5200-33B (August 28, 2007) : Hazardous Wildlife Attractants On Or Near Airports

This e-mail of course only responds on behalf of the FAA and the Federal provisions shown above.

We concur with your conclusion that the provisions of 49 USC 44718(d) do not apply to this proposed expansion of the Vernon County Landfill. These provisions specifically do not apply to landfills that were constructed or in operation prior to April 5, 2000. The Vernon County Landfill was first constructed in 1993. In addition, the Viroqua Airport does not have regularly scheduled service in addition to general aviation operations, so the provisions of FAA AC 150/5200-34A, Construction or Establishment of Landfills Near Public Airports do also not apply.

Regarding the provisions of FAA Advisory Circular No 150/5200-33B, Hazardous Wildlife Attractants On Or Near Airports: The Landfill is outside the 10,000' area of primary concern identified in the AC. While FAA encourages the Landfill to continue its efforts under their Wildlife Hazard Management Plan, we recognize that FAA does not have regulatory or approval authority over the Landfill in this regard.

Based on the above, FAA has no objection to the proposed expansion at the Vernon County Landfill. Please feel free to contact me if you have any questions or additional concerns.

From: Brian Kent <bkent@sehinc.com>
Sent: Thursday, March 18, 2021 4:02 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: RE: Vernon County Landfill

Thank you

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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From: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Sent: Thursday, March 18, 2021 1:46 PM
To: Brian Kent <bkent@sehinc.com>
Subject: RE: Vernon County Landfill

Brian, I apologize for not getting back to you. I'll do my best to get you a more formal response by end of day tomorrow.

From: Brian Kent <bkent@sehinc.com>
Sent: Thursday, March 18, 2021 1:38 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: FW: Vernon County Landfill

Hi Bobb-
I apologize for my persistence but I am following up to check on the status of your response. Your response is needed as part of our permitting process and we are needing to get this to the WDNR in the very near future. Please reply at your earliest convenience. Thank you.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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From: Brian Kent
Sent: Tuesday, March 2, 2021 9:55 AM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: RE: Vernon County Landfill

Hi Bobb-
I hope all is well. Just following up with the below email correspondence. I have not received a formal response and wondering if it perhaps was misplaced? Thanks much.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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From: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Sent: Tuesday, December 29, 2020 3:08 PM
To: Brian Kent <bkent@sehinc.com>
Subject: RE: Vernon County Landfill

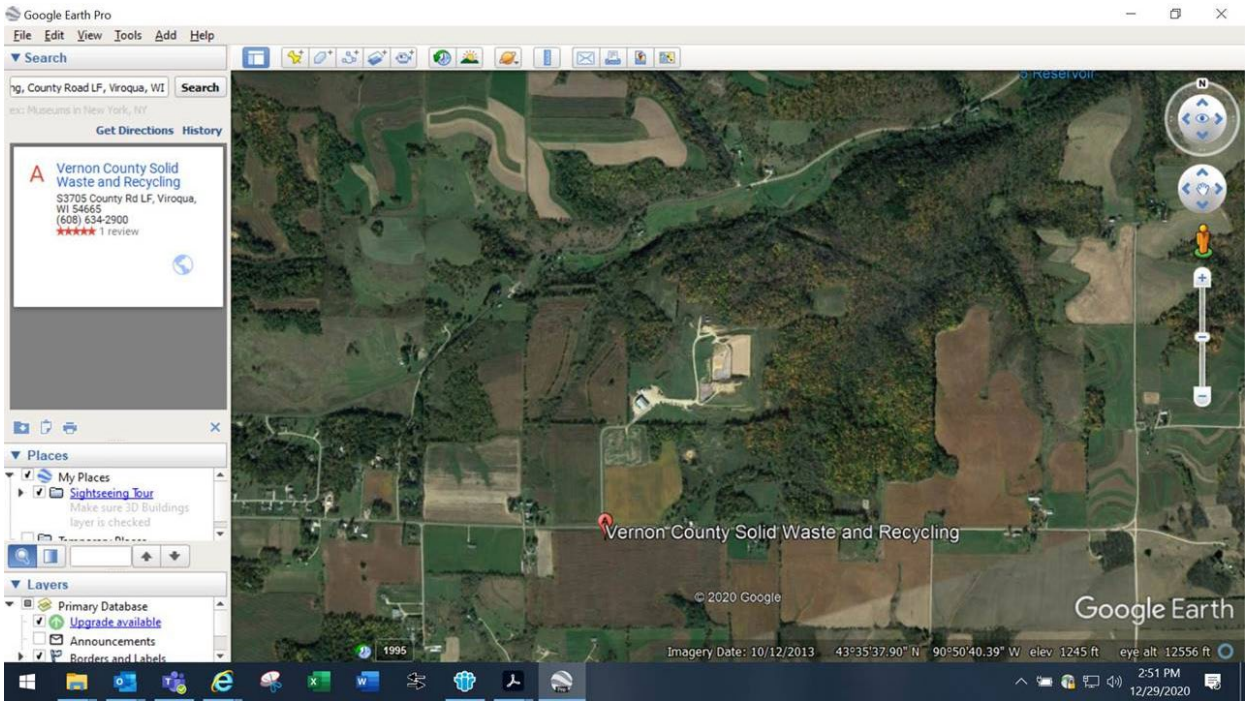
Great, that's the same facility I'm looking at.

Informally the expansion is exempt from 49 USC Section 44718(d) for 2 reasons: the expansion is of an existing landfill, and the Viroqua airport does not have regularly scheduled service in addition to general aviation. It's also outside the 10,000' area of primary concern put forth in FAA's Advisory Circular 150/5200-33B.

I'll work on a formal response email later this week.

From: Brian Kent <bkent@sehinc.com>
Sent: Tuesday, December 29, 2020 2:53 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: RE: Vernon County Landfill

Yes- below is a screen shot of what shows up for me.



Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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From: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Sent: Tuesday, December 29, 2020 2:14 PM
To: Brian Kent <bkent@sehinc.com>
Subject: RE: Vernon County Landfill

Hi Brian,

I'm also working remotely, and it's been impacting my normal ability to evaluate landfill requests such as this. Can you confirm that the facility identifies as Vernon County Solid Waste and Recycling on Google Earth?

From: Brian Kent <bkent@sehinc.com>
Sent: Tuesday, December 29, 2020 1:52 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: Vernon County Landfill

Bobb-
Attached is the letter SEH issued on October 23, 2020 providing notification of Vernon County's plan to expand their existing municipal waste landfill. I had not heard anything yet so I figured I better check on the status. Please feel free to contact me to discuss should you have any questions or issues. Please note I am working remotely due to COVID. If you prefer to call, please call my cell number at 715.456.4621. Also, if you already responded by mail it is possible that I have not received it yet since it takes a while to get my mail with our office being closed. Thanks in advance for your response.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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October 23, 2020

RE: Vernon County Landfill
Proposed Landfill Expansion (WDNR License No. 3268)
SEH No. VERSW 157634 14.00

FAA Airport Division
AGL - 600
2300 East Devon Avenue
Des Plaines, IL 60018

Dear Sir or Madam:

Short Elliott Hendrickson Inc. (SEH) is submitting this letter on behalf of Vernon County to notify the Federal Aviation Administration (FAA), and other concerned parties, of the County's proposed expansion of the Vernon County Landfill (WDNR License No. 3268). This notification is being provided to meet the provisions and requirements outlined in the following State and Federal Rules and guidance:

- s. NR504.04(3)(e) Wisconsin Administrative Code
- 40 CFR 258.10 –Airport Safety
- 49 USC Section 44718(d), as amended by Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L No. 106-181 (April 5, 2000)
- FAA Advisory Circular AC No. 150/5200-34A (January 26, 2006) : Construction or Establishment of Landfills Near Public Airports
- FAA Advisory Circular AC No. 150/5200-33B (August 28, 2007) : Hazardous Wildlife Attractants On Or Near Airports

The proposed Vernon County Landfill Expansion (Landfill Expansion) is located in the Southern Half of Section 12, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin. The proposed horizontal landfill expansion encompasses approximately 10-acres due west and north and contiguous to the current permitted landfill. As shown the Attached Figure 1, "Site Location" the landfill expansion is located approximately 2.8 miles northeast of the closest runway at the Viroqua Municipal Airport and the existing landfill and expansion are not located in the approach or departure path for the airport.

The limitations of 49 USC Section 44718(d) apply to new municipal solid waste landfills (MSWLF's), which are defined as a municipal waste landfill that was established or constructed after April 5, 2000. Additionally, FAA Advisory Circular AC No. 150/5200-34A states that 49 USC Section 44718(d) does not apply to the expansion or modification of an existing MSWLF. The current active Vernon County Landfill was first constructed in 1993, therefore exempt from the limitations of 49 USC Section 44718(d).

As part of the last expansion process, Vernon County issued a letter to the FAA on May 29, 2002 notifying interested parties of their intention to expand. In a letter dated June 16, 2002 the FAA responded with a letter concurring with the proposal relative to compatibility standards contained in FAA Advisory Circular AC No. 150/5200-33, with the following conditions:

1. The landfill facility must be properly supervised to assure that the bird populations are not increasing and that appropriate control procedures are being followed.
2. Any increases in bird activity that might be hazardous to safe aircraft operations will result in prompt mitigation actions and/or closure of the landfill
3. The above conditions must be clearly defined via State/Local licensing procedures associated with establishment of the landfill.
4. The landfill owner/operator should develop and implement a Wildlife Hazard Management Plan for operation of the landfill.

A Wildlife Hazard Management Plan (Plan) was included in their Plan of Operation, which has been approved by the WDNR and part of the facility operating record. The Plan utilizes the following strategies:

- Minimization of standing water areas
- Minimization of uncovered waste areas
- Prompt revegetation of disturbed areas outside of the waste footprint
- Utilization of bird harassment techniques, perch deterrents, and avoidance structures, as needed

We understand that the FAA does not approve or disapprove of solid waste landfill locations but is primarily concerned about location relative to safety. We request that you review this letter and attachments and reply with your assessment of the proposed landfill expansion. Please contact me at 608.498.4844 with any questions or concerns.

Sincerely,

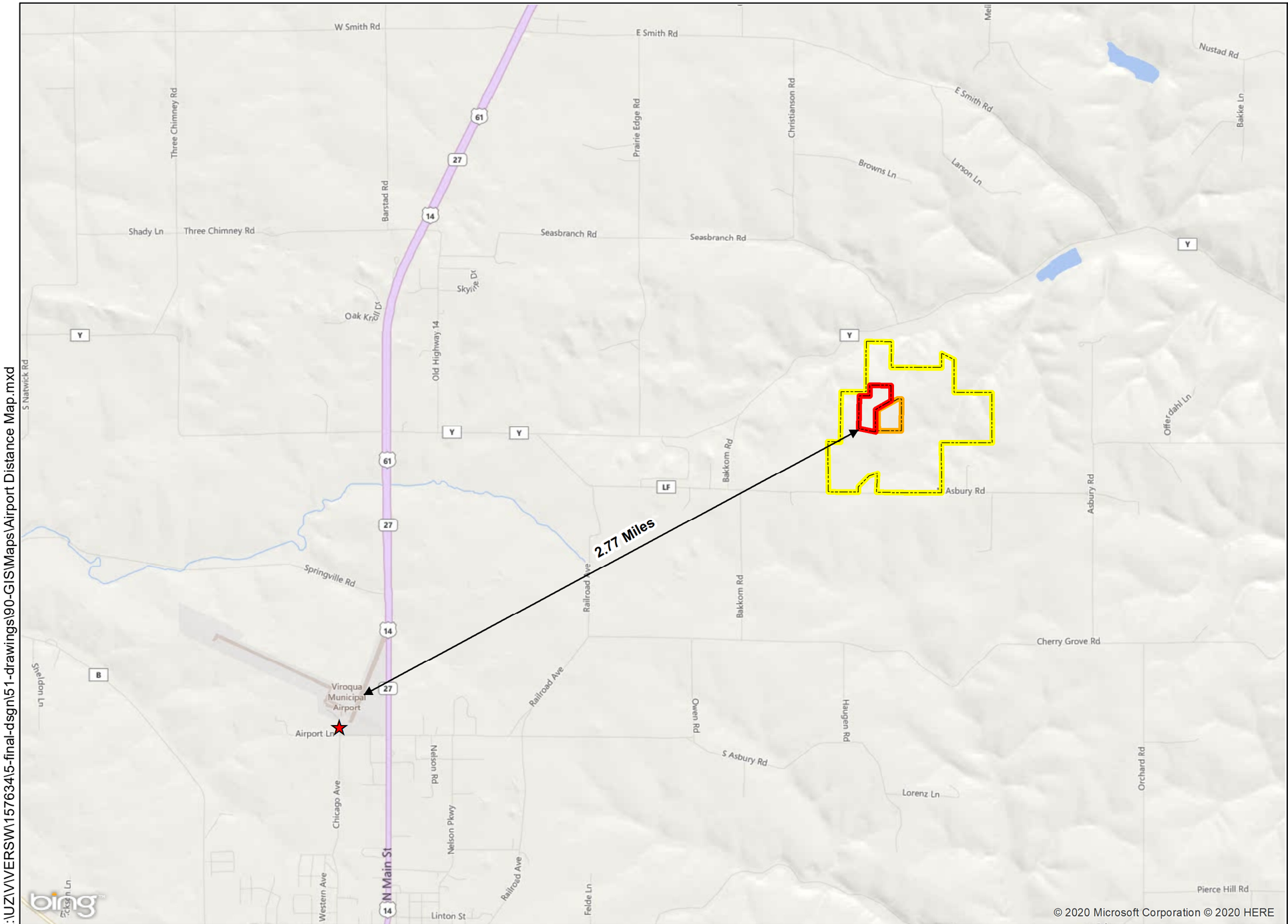
SHORT ELLIOTT HENDRICKSON INC.



Brian L. Kent, CHMM
Project Manager

BLK
Attachment
c: Stacie Sanborn, Vernon County Solid Waste (electronic)
Stacey Miller, Wisconsin DOT, Bureau of Aeronautics
Michael Skildum, Viroqua Municipal Airport Manager
Darryl R. Heaps, SEH (electronic)

x:\uz\v\versw\157634\3-env-stdy-regs\isi_isr\faa_airport\versw_faa notification letter 10.23.2020.docx



Legend

- Landfill Property Boundary
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Landfill Expansion

N
W E
S

0 0.25 0.5 1 Miles

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
rjh

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SEH
10 North Bridge Street
Chippewa Falls, WI 54729
PHONE: (715) 720-6200
FAX: (715) 720-6300
WATTS: 800-472-5881
www.sehinc.com

PROJECT: VERSW157634

DATE: 10/20/2020

ISI REQUEST
VERNON COUNTY LANDFILL
(WIDNR LICENSE NO.3268)

Distance to Viroqua Municipal Airport

Figure 1

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B-5 – WDNR Vernon County ISR Completeness December 17, 2021

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg WI 53711-5397

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

December 17, 2021

File Ref: FID 663038310
Vernon County
SW/CORR

Ms. Stacie Sanborn
Vernon County Landfill
Route 3, Box 247 B
Viroqua, WI 54665

Subject: Initial Site Report for the Proposed Vertical and Horizontal Expansion
Vernon County Landfill, Viroqua, Wisconsin – License #3268

Dear Ms. Sanborn:

The Wisconsin Department of Natural Resources (department) has reviewed the report titled "Initial Site Report, Proposed Vertical and Horizontal Expansion, Vernon County Landfill." Based on this review, the department has determined that the Initial Site Report for the proposed expansion contains the minimum information required by ch. NR 509, Wis. Adm. Code, and is therefore complete.

This completeness determination is not a determination of site feasibility. It only indicates that sufficient information has been provided for the department to render an opinion and offer recommendations regarding the potential the proposed property has for development of a landfill expansion. The department expects to issue an opinion on the potential of the proposed expansion within 60 days.

If you have any questions about this completeness determination, please do not hesitate to contact Carolyn Cooper at 608-931-9387 or carolyn.cooper@wisconsin.gov.

Sincerely,

Natasha Gwidt, P.E.

Natasha Gwidt, P.E.
Field Operations Director
Waste and Materials Management Program

cc: Brian Kent, SEH
Carolyn Cooper, DNR - SCR
Tess Brester, DNR - NER
John Morris, DNR - WCR
Joe Lourigan, DNR - WA
Valerie Joosten, DNR-WA
Facility File

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B-6 – WDNR Vernon County ISR Opinion February 15, 2022

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg WI 53711-5397

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

February 15, 2022

File Ref: FID 663038310
Vernon County
SW/CORR

Ms. Stacie Sanborn
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Subject: Initial Site Report Opinion Letter for the Proposed Vertical and Horizontal Expansion
Vernon County Landfill, Vernon County, Wisconsin, License #3268

Dear Ms. Sanborn:

The Department of Natural Resources (department) has completed a review of the initial site report (ISR) for the proposed vertical and horizontal expansion of the Vernon County Landfill. The report, dated November 17, 2021, was prepared on behalf of the La Crosse County Solid Waste Department by Short Elliott Hendrickson, Inc. (SEH), and was received by the department on November 19, 2021. The department sent a letter to the Vernon County Landfill on December 17, 2021, indicating that the department determined the ISR to be complete.

It is the department's opinion, based on the information presented in the ISR, that the proposed expansion has limited potential for development as a solid waste disposal facility. A summary of the proposal, specific comments regarding the ISR and potential constraints to the site's feasibility are outlined below.

PROPOSAL DESCRIPTION

Site Location and Land Use

The proposed expansion would be in the SE¼ of the SW¼ and the SW¼ of the SE¼ of Section 15, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin. The proposed expansion would include an approximate 9-acre (based on the proposed AGIP dated December 13, 2021) contiguous horizontal and vertical expansion east of the existing active municipal solid waste (MSW) landfill.

The horizontal component consists of an approximate 4-acre horizontal expansion due east and contiguous with the existing Phase III of the active landfill. The vertical expansion would extend the existing landfill vertically over an approximate 5-acre area of the existing landfill footprint.

The proposed expansion, plus the existing active MSW landfill, would occupy approximately 15 acres of the approximate 250 acres owned by Vernon County. The land use surrounding and adjacent to the landfill property consists of a mix of agricultural and wooded parcels. The closest residence is located to the south on County Road LF, approximately 1,500 feet from the landfill.

The landfill's existing stormwater sedimentation basin located east of the existing landfill may need to be moved and/or enlarged to accommodate a proposed expansion of the landfill. According to the ISR, current zoning would not require special applications or variances to facilitate the landfill expansion. Since the entire proposed expansion footprint is located on Vernon County property and does not require a purchase of agricultural property, an Agricultural Impact Statement would not be required.

Proposed Design Capacity, Service Area, and Anticipated Site Life

The proposed landfill expansion would have a design capacity of approximately 430,000 cubic yards. The landfill accepts solid waste from residential, commercial, industrial, and institutional sources. The anticipated service area includes municipalities, commercial businesses and industries located within Vernon County (21 townships, 9 villages, and 3 cities). Vernon County also serves as the Recycling Responsible Unit for the municipalities located within the county. The recycling program provides roll-off containers and curbside delivery and pick up. Recycled materials are delivered to the recycling building located on the landfill property, where they are processed and sorted. According to the ISR, the proposed expansion would extend the existing facility site life by 15 years.

Transportation and Access

The main roads leading to Viroqua and the landfill include US Highway (USH) 14/State Highway (STH) 27 from the north, STH 56 from the West, STH 56/82 from the east, USH 14 from the south, and STH 27/82 from the southwest. Access to the landfill is gained by turning east on County Road (CR) Y from US 14/STH 27. No changes are proposed to the existing landfill access routes.

Waste Types and Characteristics

Slight changes may occur as the result of improvement to national, regional and local recycling initiatives, such as food wastes or other high organic waste streams being diverted. During 2020, approximately 20,937 tons of waste were placed in the MSW landfill. Of this tonnage, approximately 95% was municipal solid wastes (MSW) and 5% was construction and demolition (C&D) material. A small volume of special waste is also accepted at the landfill.

Initial Site Inspection

An Initial Site Inspection (ISI) request letter was submitted by SEH, on behalf of Vernon County, on November 4, 2020, and a revised ISI request on September 3, 2021. The revised request proposed an area to the north and east of the existing landfill for a potential landfill expansion, in addition to the areas to the north and west of the landfill that were considered in the original ISI request. The revised request noted that soil borings advanced in May 2021 encountered shallow bedrock to the west of the active landfill. This finding, along with topographic and property boundary limitations to the west and northwest of the landfill, prompted Vernon County to consider the area north and east of the existing landfill for possible landfill development.

The department conducted site inspections in accordance with s. 509.04, Wis. Adm. Code, on November 18, 2020, and September 30, 2021. The department's ISI preliminary opinion letters, dated December 15, 2020, and November 1, 2021, determined that the site location has potential for development of a landfill expansion.

Regional Geotechnical Information

The proposed landfill expansion is located in an unglaciated portion of Wisconsin known as the "Driftless" region. Topography within this area is typified by systems of bedrock ridges cut by stream and river valleys. The ridge and valley system is present in the immediate vicinity of the site, with elevations ranging from approximately 1040 feet mean sea level (MSL) to 1260 feet MSL within the site boundaries. Generally, the lower elevations are present to the north along the Seas Branch drainage, and to the southeast along an unnamed

discontinuous drainage. A system of bluffs forms the higher elevations generally through the central portion of the site. The proposed horizontal expansion area is along the top of this bluff system.

The site is located within the West Fork Kickapoo River Watershed, part of the Lower Wisconsin River Drainage Basin. Surface water from the site generally flows north to the Seas Branch or to the southeast toward an unnamed discontinuous drainage way, both of which feed into the West Fork of the Kickapoo River. The West Fork of the Kickapoo River flows to the south, meeting the Kickapoo River, and eventually the Wisconsin River. Regional surface water eventually drains to the Mississippi River.

The Wisconsin Wetland Inventory Map does not identify any wetlands within the proposed landfill expansion area. A wetland area is identified on the shorelines of Seas Branch, approximately one-half mile northeast of the site. A review of the department's Surface Water Data Viewer (SWDV) indicated a location within the proposed project area with potential wetland indicators. The area of potential wetland indicators was inspected by an assured wetland delineator on May 4, 2021, on behalf of Vernon County. The field visit was conducted under temperatures that were normal and precipitation conditions that were drier than normal as compared to the historical average for the region. The inspection concluded that no areas meeting the technical criteria for wetland are present within the area investigated.

Unconsolidated deposits generally consist of loess and clay soils generated from weathering of dolomite bedrock ridges and alluvium and lacustrine deposits in the river and stream valleys. These soils are typically fine-grained and range from silts and clays above the dolomite ridges to sands on the valley floors. The thickness of unconsolidated deposits generally range from 0 to 50 feet throughout the area.

The uppermost bedrock unit at the site consists of Ordovician dolomites of the Prairie du Chien Group, likely the Oneota Formation, which occur as the uppermost bedrock unit on the ridges in this area. Thickness of the Prairie du Chien group deposits ranges from 0 to 250 feet. Cambrian sandstone bedrock underlies the Prairie du Chien group. The Cambrian sandstone is typically the uppermost bedrock unit in the weathered stream valleys in the proximity of the site. In southwestern Wisconsin, the Cambrian sandstone unit is generally up to 1,200 feet thick, and includes the Jordan Sandstone (uppermost unit), St. Lawrence Formation, Tunnel City Formation, Wonewoc Formation, Eau Claire Sandstone, and Mount Simon Sandstone (bottom unit). The Cambrian sandstone sequence is underlain by thousands of feet of Precambrian crystalline igneous and metamorphic rock.

Three major aquifers are used for potable water production in the Lower Wisconsin River basin: the sandstone aquifer, the sand and gravel aquifer, and the Galena-Platteville aquifer. The sandstone aquifer is present in saturated portions of Cambrian sandstone bedrock, with well yields of up to 1,850 gallons per minute. The sand and gravel aquifer utilizes groundwater in saturated unconsolidated sand and gravel deposits, mostly in river and stream valleys. The Platteville-Galena aquifer produces water from saturated portions of the Platteville Galena dolomite.

According to the ISR, neither the sand and gravel aquifer nor the Platteville-Galena aquifer are present in the proposed landfill expansion area. The sandstone aquifer would be the only aquifer available for use within the area. Based on groundwater monitoring at the landfill site, groundwater elevation in the proximity of the landfill expansion area is approximately 1,100 ft MSL.

Regionally, groundwater flows to the southeast, toward the Kickapoo River in the western portion of Vernon County. Locally, groundwater contours typically mirror surface topography, with groundwater flowing from areas of higher surface elevation towards the valleys, ultimately feeding into streams as groundwater discharge areas in lower elevations.

POSSIBLE CONSTRAINTS ON SITE FEASIBILITY

At this time, the department has identified the following locational and performance criteria that may limit the potential for site development.

1. Suitability of the Locational Bedrock

The uppermost bedrock unit at the site is fractured dolomite. Flow patterns through fractured bedrock generally are difficult to monitor and do not retard or facilitate attenuation of contaminants in groundwater. Fractured bedrock flow can act as a conduit to deeper aquifers that may be sources for water supply wells, in the event of groundwater impacts. The ISR states that it is anticipated that bedrock excavation may be necessary to achieve a 10-foot separation between the bottom of the liner and the top of bedrock. The feasibility report should discuss what type of soil backfill and method of placement that would be used to achieve the 10-foot minimum separation. The geotechnical analysis should also discuss the suitability of this geological setting with respect to demonstrating compliance to the groundwater protection standard of s. NR 504.04 (4)(d), Wis. Adm. Code. This may include an evaluation of the bedrock fractures including their size, frequency, distribution, connectivity, hydraulic conductivity, observations from boring and well drilling, existing facility design and performance, and other aspects. Alternative designs and additional measures to protect groundwater should be considered and discussed. Examples of additional measures may include an additional layer to the liner, additional leachate extraction, larger diameter leachate collection pipes or other designs to provide additional protection to groundwater. The feasibility report should include a discussion of the proposal and any alternatives considered, using the information from the site-specific geotechnical investigation.

In addition, the ISR states the Cambrian sandstone aquifer would be the only aquifer available for use within the proposed landfill expansion area. However, cross-sections and logs from previous investigation conducted at the site indicate the existence of perched groundwater and water table aquifer conditions within the Ordovician dolomites of the Prairie du Chien Group beneath the site. The feasibility report should provide a more complete description of the groundwater conditions, aquifers, and hydrogeology at the site, using existing and new information from the site-specific geotechnical investigation.

The department will evaluate the suitability of the site-specific geological setting, groundwater conditions and potential risks to groundwater quality upon review of the feasibility report.

2. Setback to Water Supply Well

The ISR indicates that the proposed expansion footprint is within 1,200 feet of one private water supply well - the well serving the landfill office and recycling center. Section NR 504.04(3)(f), Wis. Adm. Code, requires a minimum distance of 1,200 feet to be maintained between the limits of filling and public or private water supply wells. If the well remains in service, the feasibility report will need to request an exemption from s. NR 504.04(3)(f), Wis. Adm. Code, for this water supply well. An exemption request needs to explain why the exemption is warranted, including supporting information showing how the well would be adequately protected from potential groundwater contamination. The supporting information should consider the factors that affect the ability to meet the groundwater protection standard which include the groundwater flow properties displayed in this site-specific bedrock, the distance to bedrock and groundwater, soil backfill characteristics and the proposed

landfill design. Additional factors to consider include the groundwater flow directions, the construction of the water supply well and the ability to effectively monitor groundwater around the facility.

In addition, a variance from the locational setback requirement of s. NR 812.08 (4) (g) (1), Wis. Adm. Code, for each water supply well located within 1,200 feet of the proposed limits of waste, under the provisions of s. NR 812.43, Wis. Adm. Code would be needed; or may need to be updated if a variance was previously issued. The feasibility report should include a copy of any previously issued NR 812 well variances. If a previous variance exists, the department will determine if an updated variance is necessary and provide that information to Vernon County. A variance may need to be updated depending on circumstances such as changes in proximity of waste to the well, changes in waste location with respect to groundwater flow, changes to the well or other reasons.

Because the review times established in ch. NR 812, Wis. Adm. Code, are different than the review times established for the feasibility report, please coordinate submittal of any variance application needed with the department so that the department's decision on the variance is synchronized with the decision on landfill's feasibility determination. The department will inform Vernon County when to submit the NR 812 variance application. Typically, this is just before the public comment period.

Any NR 812 well variance applications should be submitted to Marty Nessman with the department's Drinking Water and Groundwater (DG) program. The NR 812 variance application form can be accessed at: https://dnr.wi.gov/files/pdf/forms/3300/3300-209.pdf The department must receive both the well construction information for each well and a completed NR 812 well variance application before the department may issue an NR 504 exemption.

ADDITIONAL COMMENTS REGARDING THE PROPOSED LANDFILL EXPANSION

As a reminder, in accordance with ss. 289.22 and 289.23, Wis. Stats., the applicant must notify all affected municipalities and apply for all specified local approvals at least 120 days before a feasibility report can be submitted to the department (the exact time period depends upon the municipal response). The Waste Facility Siting Board has specific requirements which apply to the municipal notification. For additional information on these requirements, please contact the Wisconsin Waste Facility Siting Board at (608) 267-7854. The feasibility report must contain documentation showing that all proper notifications and applications for all specified local approvals have been made, in accordance with s. NR 512.06, Wis. Adm. Code.

This opinion letter does not approve or deny the proposed expansion. If Vernon County wishes to pursue the proposed expansion, the feasibility report must address the concerns listed above and contain the information required in ch. NR 512, Wis. Adm. Code. This includes the requirement to include a request for an exemption for all locational and performance criteria or other code requirements that the proposed landfill cannot meet. Each exemption request needs to include an explanation demonstrating why the exemption is warranted. Please also remember that the department may request additional information as it reviews the feasibility report.

Please contact Carolyn Cooper at (608) 931-9387 or carolyn.cooper@wisconsin.gov with any questions or comments regarding this letter.

Sincerely,

Natasha Gwidt, P.E.

Natasha Gwidt, P.E.
Field Operations Director
Waste and Materials Management Program

CC: Carolyn Cooper – DNR/WA
Tess Brester – DNR/WA (via email)
John Morris – DNR/WA (via email)
Joe Lourigan – DNR/WA (via email)
Valerie Joosten – DNR/WA (via email)
Brian Kent – SEH (bkent@sehinc.com)

B-7 – WDNR Vernon County AGIP Acceptance Letter March 30, 2022

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg WI 53711-5397

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

March 30, 2022

File Ref: FID 663038310
Vernon County
SW/CORR

Ms. Stacie Sanborn
Vernon County Landfill
Route 3, Box 247 B
Viroqua, WI 54665

Subject: Acceptance of Proposed Alternative Geotechnical Investigation Program for Feasibility Study, Vernon County Landfill, Vernon County, Wisconsin – License #3268

Dear Ms. Sanborn:

The Department of Natural Resources (department) has reviewed the proposed alternative geotechnical investigation program (AGIP) for the proposed vertical and horizontal expansion of the Vernon County Landfill. The AGIP was detailed in a Short Elliott Hendrickson Inc. (SEH) document titled *Alternative Geotechnical Program Request, Proposed Landfill Expansion, Vernon County Landfill, WDNR License No. 3268,* dated December 13, 2021. The AGIP will be carried out at the proposed area for the landfill expansion, located on land owned by Vernon County in the SE¼ of the SW¼ and the SW¼ of the SE¼ of Section 15, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin.

The department has reviewed the document and accepts the proposed AGIP, with a few modifications. Please include a copy of the request and this letter in the feasibility report. Formal approval of the AGIP would be included in the department's feasibility determination for this project. The department's comments on the proposed AGIP, including the modifications and rationale for this acceptance, are provided below.

The AGIP was submitted to outline geotechnical investigation activities proposed as part of the characterization work required for the expansion of the Vernon County landfill. The landfill expansion includes a horizontal expansion on approximately four acres due east and contiguous with the existing municipal solid waste landfill and an approximate five-acre vertical expansion over the eastern portion of the existing landfill footprint. The proposed AGIP includes eight new borings, four within the horizontal expansion footprint and four within 150 feet of the horizontal expansion footprint. Some of the additional borings will be converted to monitoring wells. The proposed AGIP would also use information from four previously drilled borings to characterize the expansion area. Two of the previously drilled borings are located within the proposed horizontal expansion footprint and were completed as monitoring wells. The combination of the existing and new borings exceeds the number of borings required by s. NR 512.09(1), Wis. Adm. Code, for a four-acre horizontal landfill expansion.

The AGIP proposes to characterize the groundwater at the site with four new water table wells and one new piezometer. The proposed AGIP would also use information from three previously installed water table wells and four previously installed piezometers/piezometer nests, to characterize the groundwater in and near the expansion area. The combination of the existing and new wells meets the numerical requirement for wells in s. NR 512.09(2), Wis. Adm. Code, for a four-acre landfill.

The SEH submittal requested exemptions to portions of ss. NR 507 and NR 512, Wis. Adm. Code. The requested exemptions are considered part of the AGIP proposal which would be formally granted as part of the AGIP approval in the feasibility determination. The department's comments regarding the requested exemptions are provided below.

1. Because attempts to core bedrock have been unsuccessful due to weathering, existing fractures, and layered heterogeneity of dolomite, dolomitic sandstone, and siltstone, Vernon County is requesting an exemption to s. NR 507.05(2), Wis. Adm. Code, and is proposing that coring of bedrock not be attempted, and the rock be drilled and wash samples collected during drilling.

   Department Response: The department finds that this exemption should be acceptable provided that the s. NR 507.05 (2), Wis. Adm. Code, bedrock core data from the wells listed in section 3.1.1 of the proposed AGIP are included in the geotechnical investigation section of the feasibility report and that the geotechnical investigation is able to address the department's concern regarding the suitability of the locational bedrock with respect to demonstrating compliance to the groundwater protection standard of s. NR 504.04 (4)(d), Wis. Adm. Code. In lieu of bedrock core sampling, downhole geophysical logging should be used to evaluate bedrock fractures including their size, frequency, distribution, connectivity and hydraulic conductivity. Prior to implementation, the department invites having a discussion with the county and its consultant on the types of downhole geophysical logging that may be useful for this situation.

2. Because past investigations at the site have shown that drilling below the water table in the bedrock with hollow stem auger cannot be accomplished, Vernon County is requesting an exemption from s. NR 507.06(1), Wis. Adm. Code, to use bentonite drilling mud to advance the drill holes to depth. To ensure that the majority of the drilling mud has been removed from each well, well development will include removal of a minimum of five well volumes (including filter pack) and measurements of field parameters between each well volume until measurements have stabilized and turbidity is negligible.

   Department Response: The department does not object to the use of drilling fluids when specific geological conditions warrant the use of such fluids. Section NR 507.06(1), Wis. Adm. Code, does not prohibit the use of drillings fluids; rather, the code states that specific documentation be recorded and submitted to the department when drilling fluids are used. An exemption to this code is not needed and consequently will not be granted because existing code allows the use of drilling fluids when drilling through bedrock. The method described in the proposed AGIP to ensure removal of the drilling fluids appears to be a reasonable approach; however, note that additional well volumes may need to be removed if the turbidity and field parameters indicate additional purging is warranted.

3. Vernon County is requesting an alternative program be approved regarding the boring program required under s. NR 512.09, Wis. Adm. Code.

   Department Response: As noted above, the combination of the existing and new borings meets the numerical requirement for wells in s. NR 512.09(2), Wis. Adm. Code, for a four-acre horizontal landfill expansion. The delineation of the vertical overlay component of the expansion is not depicted in the proposed AGIP. Section 2.2 discusses the number of previously installed borings to characterize the subsurface geology; however, it does not discuss which borings can be used to characterize the subsurface of the vertical overlay component. The previously installed borings used to characterize the subsurface of the area within 300 feet of the vertical overlay for past feasibility reports should also be used to draw the cross-sections.

4. Vernon County is requesting an alternative be approved regarding the wells and piezometers required under s. NR 512.09, Wis. Adm. Code.

   Department Response: As noted above, the combination of the existing and new wells meets the numerical requirement for wells in s. NR 512.09(2), Wis. Adm. Code, for a four-acre horizontal landfill

expansion; however, the department requests that Vernon County consider installing a water table well northeast of the expansion area, east of the word "wooded" on Figure 7 of the AGIP. This well could help better define the groundwater divide to the north of the proposed expansion area and would be a northern point beyond the limits of waste on an east-west cross-section.

5. Section NR 512.09(4)(a), Wis. Adm. Code, requires that for each major soil unit, at least five representative samples be analyzed for grain size distribution and Atterberg limits; however, because weathered and competent dolomite are present at the site, Atterberg limits cannot be established for all site soils. Vernon County is requesting an exemption from s. NR 512.09(1) and (2), Wis. Adm. Code.

   Department Response: Because s. NR 512.09(4)(a), Wis. Adm. Code, requires analyses for Atterberg Limits "as appropriate for the particular type of material," an exemption to s. NR 512.09(4)(a), Wis. Adm. Code, is not necessary and consequently not granted. The department recognizes that liquid and plastic limits cannot be determined for certain soil types.

   The department will allow the use of previously collected soil laboratory testing data toward meeting the requirements of s. NR 512.09(4), Wis. Adm. Code. This data, along with newly acquired data, must be submitted with the feasibility report. Grain size distribution and Atterberg limits are important geotechnical properties used to properly describe the soil and rock lithologies and to estimate respective strength and settlement characteristics.

6. Section NR 512.09(4)(b), Wis. Adm. Code, requires that hydraulic conductivity be conducted on two representative soil samples from each major fined-grained unit. The two fine-grained units identified at the site are loess and residuum. Two thin wall samples will be collected from each of the fine-grained units on-site to determine Coefficient of Permeability. Vernon County is requesting an exemption from this requirement for the weathered dolomite and competent dolomite, because relatively undisturbed samples cannot be obtained. If deemed feasible during field work, an alternate sampling method using the brass-lined split-spooned sampler (ASTM D 4700) will be attempted in weathered dolomite to collect undisturbed samples for laboratory testing.

   Department Response: The department concurs with the proposal to attempt collection of undisturbed samples of weathered and competent bedrock.

   The department will allow the use of previously collected hydraulic conductivity data toward meeting the requirements of s. NR 512.09(4), Wis. Adm. Code. This data, along with any newly acquired data, must be submitted with the feasibility report. Hydraulic conductivity information is necessary to determine groundwater and potential contaminant transport pathways and velocities.

7. Vernon County Landfill is requesting an exemption to use previously collected data to meet requirements of s. NR 512.09, Wis. Adm. Code. Use of this data would include, but not be limited to, the following:

   - Field hydraulic conductivity tests completed on the existing wells, including those wells which have been abandoned.
   - Grain size analysis, Atterberg limits, soil classification, and laboratory hydraulic conductivity from past investigations.
   - Soil boring logs from past investigations which are not totally compliant with the present s. NR 507.05, Wis. Adm. Code, but provide useful and accurate data.
   - Existing groundwater quality data as background data.

Department Response: The department will allow the use of previously collected field and laboratory data towards meeting the requirements of s. NR 512.09(4), Wis. Adm. Code. This data, along with newly acquired data, must be submitted with the feasibility report. Please note that the soil characteristics representative of the area of the horizontal component of the expansion would be necessary. The exemption appears to be justified based on the location of the existing borings and wells and the amount of available previous technical data for the site.

The department notes that Vernon County is not requesting exemptions from the required baseline groundwater monitoring or collection of water elevation data. The department notes that it is not expected that core samples would be available from borings installed as part of previous investigations; however, core samples obtained from newly drilled borings should be retained through the feasibility determination in accordance with the requirements of s. NR 507.05(1)(e), Wis. Adm. Code.

8. Vernon County is requesting an exemption to the requirement in s. NR 512.11(2), Wis. Adm. Code, which requires that geological cross-sections be constructed through all borings, because a considerable amount of boring and monitoring well data for the proposed expansion exists. Vernon County proposes to construct cross-sections only through the borings and wells that assist in defining the lateral and vertical extent of the major lithostratigraphic units.

   Department Response: It is not clear what it means to only use borings and wells that assist in defining the lateral and vertical extent of the major lithostratigraphic units. All borings and wells assist in defining the lateral and vertical extent of the major lithostratigraphic units. The more data points used increases the confidence level in depicting the subsurface. All of the borings, wells and piezometers that are used to define the subsurface for the area of the vertical and horizontal expansion should be used to draw the cross-sections. This would include those borings, wells and piezometers within 300 feet of the limits of the vertical and horizontal expansion. The department does not agree with this request.

9. Sections NR 507.14 and NR 140.23, Wis. Adm. Code, require that soil boring information be presented on department forms and include the information listed in s. NR 507.14(2), (3) and (4), Wis. Adm. Code. Some historic data from the files for the year 1987 are not available; however, some historical soil boring descriptions are presented on geological figures in historical files. Although sufficient information is provided from available and proposed soil boring logs, Vernon County is requesting an exemption for the use of all historical logs during final presentation in the feasibility report, if appropriate, to assist in the overall site interpretation.

   Department Response: The department concurs that if an historical soil boring log is not available then it cannot be used. In addition, the department understands some historic soil boring logs may be recorded on non-department forms and therefore may not capture all of the information recorded on current department forms. All available boring logs within 300 feet of the proposed limits of the vertical and horizontal expansion that were used for previous feasibility reports should be provided.

The department reserves the right to require additional geotechnical information if necessary to fully evaluate subsurface conditions at the site and to complete review of the feasibility study. If major changes are made to the proposed footprint during design development, Vernon County should work with the department to determine if additional geotechnical investigation will be needed. The department may also require the installation of additional monitoring wells and piezometers as part of the feasibility determination or plan of operation approval if the department determines additional monitoring points are needed to adequately monitor groundwater quality around the landfill.

Please contact Carolyn Cooper at (608) 931-9387 or carolyn.cooper@wisconsin.gov with any questions or comments regarding this letter.

Sincerely,



Bridget Kelly
Waste and Materials Management Program Supervisor
South Central Region

cc: Carolyn Cooper – DNR/WA
Tess Brester – DNR/WA (via email)
John Morris – DNR/WA (via email)
Joe Lourigan – DNR/WA (via email)
Valerie Joosten – DNR/WA (via email)
Brian Kent – SEH (bkent@sehinc.com)

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B-8 – WDNR Renewed ER Review August 18, 2023

Endangered Resources Review for the Proposed Vernon County Landfill v3 - Renewed 08/18/23, Vernon County

Vernon County Landfill v3 - Renewed 08/18/23

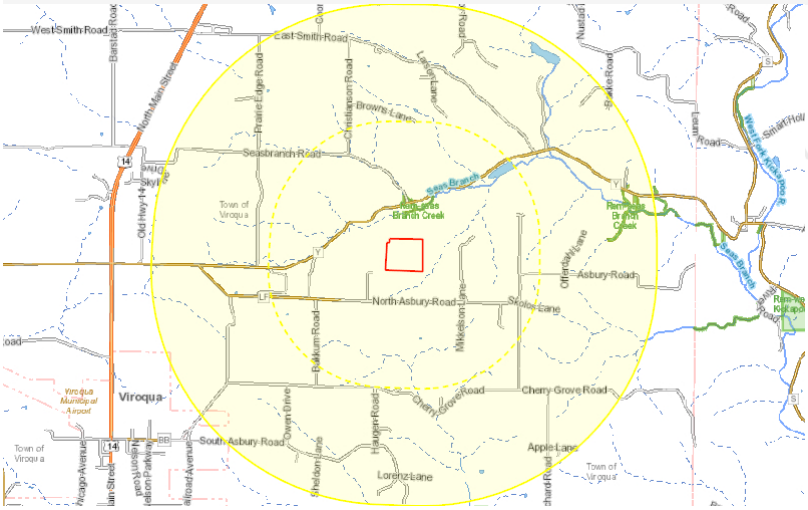
Reviewer Information

Reviewer Name	Laura Spears
Review Date	8/18/2023
Bureau / Org Name	Watershed Management
Work Station	Iowa

General Information

Project Title	Vernon County Landfill v3 - Renewed 08/18/23
Project No	
Federal Nexus	
Project Timing	
Property Type	

Map



Project Location

County	Vernon
PLSS Description	T13N R04W S15
Township Name	Viroqua
Ownership Type	
Landowner Name	

Project Information

Description	expanded area of the Vernon County Landfill
Habitat Description	expansion/improvements to existing landfill
Impacts to Wetlands and Waterbodies	
Additional DNR and Other Permits	

Element Occurrences

No element occurences exist in this area

Actions that need to be taken to comply with state and/or federal endangered species laws: None

Actions recommended to help conserve Wisconsin's Endangered Resources: None

Additional Recommendations: **None**

No actions are required or recommended for the following endangered resources: None

Disclaimer

This ER Review may contain Natural Heritage Inventory data (http://dnr.wi.gov/topic/NHI), including specific locations of endangered resources, which are considered sensitive and are not subject to Wisconsin's Open Records Law. As a result, information contained in this ER Review may be shared only with individuals or agencies that require this information in order to carry out specific roles in the permitting, planning and implementation of the proposed project. Specific locations of endangered resources may not be released or reproduced in any publicly disseminated documents.

Details related to project location, design, and timing of disturbance are important for determining both the endangered resources that may be impacted by the project and any necessary follow-up actions. If the project plans change, new details become available, or more than a year passed, please renew this review.

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Volume 2 of 4

Feasibility Report - Proposed Eastern Expansion (WDNR License No. 3268)

Vernon County Landfill

Viroqua, Wisconsin

VERSW 167824 | September 11, 2023

SEH
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Appendix C

Local Notifications, Approvals, and Report Submittal to Municipalities

C-1 – Local Notifications and WI WFSB Certified Mail Confirmation
C-2 – Landfill Siting Resolution by the Town Board of Viroqua
C-3 – WFSB Notifications

C-1 – Local Notifications and WI WFSB Certified Mail Confirmation

June 1, 2022

VIA CERTIFIED MAIL
CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Jody Audetat
County Clerk
Vernon County
400 Courthouse Square
Room 108 Courthouse Annex
Viroqua, WI 54665

RE: Vernon County Landfill
Proposed Solid Waste Landfill Expansion

Dear Jody Audetat:

The Vernon County Landfill is the hub of a solid waste management system that serves residents, businesses and industry in Vernon County. Our integrated system provides reuse, recycling and disposal services, in addition to programs designed to reduce the toxicity of various waste streams and provide convenience to system users. The services offered by our system are consistent with the State of Wisconsin's preferred waste management hierarchy, and as a publicly-owned system, we are focused on managing waste locally. This full-service approach is vital to our environmental and economic sustainability.

In order to continue to provide these services into the future, the Vernon County Solid Waste Department has begun the permitting process to expand our existing municipal solid waste landfill to continue to provide solid waste services to Vernon County. As part of this process, Wisconsin Statute §289.22 (Local Approval), requires the applicant to submit a written request for the specification of all applicable local approvals to each affected municipality. This formal request is being sent because Vernon County is considered an "affected municipality" as defined by Wisconsin Statute §298.01(1). Therefore, Vernon County Solid Waste Department hereby requests Vernon County specify all applicable local approvals that are required for a municipal solid waste facility. If no local approvals are required, please reply with a statement indicating such.

To assist you with this request, the following information regarding the proposed landfill expansion is provided.

Project Description

The proposed landfill expansion will consist of a contiguous horizontal and vertical expansion to the existing landfill currently located within the Town of Viroqua, Vernon County, Wisconsin. The proposed footprint of the horizontal expansion is anticipated to be approximately 4-acres that will extend due east and contiguous with the existing landfill. The expansion will overlay its waste onto the east side of the existing landfill to promote a minimized landfill footprint. The vertical component will extend vertically over the existing footprint resulting in final waste elevations higher than those currently permitted. The proposed expansion will be located on land currently owned by Vernon County and provide approximately 15 years of additional site life.

Owner and Applicant:	Vernon County Solid Waste Department S3705 County Highway LF Viroqua, WI 54665
Facility Type:	Municipal Solid Waste Landfill

Proposed Expansion and Existing Landfill Location:	SE ¼ of the SW ¼ and SW ¼ of the SE ¼ of Section 15, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin
Affected Municipalities:	Town of Viroqua Vernon County

Please find attached the Standard Notice prepared by the State of Wisconsin Waste Facility Siting Board (revised 1/25/2018). Please review the Standard Notice carefully as this serves to inform a municipality of the actions and deadlines required to qualify for participation in negotiations and arbitration concerning the proposed siting of all new or expanded solid or hazardous waste facilities in Wisconsin.

Please send your written response to this request **within 15 days** of receipt to the contact and address below:

Stacie Sanborn, Solid Waste Director
Vernon County Solid Waste Department
S3705 County Highway LF
Viroqua, WI 54665

Thank you in advance for your attention and cooperation with this matter. We look forward to working with you during this landfill expansion process.

Sincerely

Stacie Sanborn
Solid Waste Director

Attachment – Waste Facility Siting Board Standard Notice

Cc: Wisconsin Waste Facility Siting Board
Town of Viroqua, Clerk
Town of Viroqua, Chairman
Brian Kent, SEH

June 1, 2022

VIA CERTIFIED MAIL
CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Phil Hewitt
Town Chairman
Town of Viroqua
S6385 Lyster Road
Readstown, WI 54652

RE: Vernon County Landfill
Proposed Solid Waste Landfill Expansion

Dear Phil Hewitt:

The Vernon County Landfill is the hub of a solid waste management system that serves residents, businesses and industry in Vernon County. Our integrated system provides reuse, recycling and disposal services, in addition to programs designed to reduce the toxicity of various waste streams and provide convenience to system users. The services offered by our system are consistent with the State of Wisconsin's preferred waste management hierarchy, and as a publicly-owned system, we are focused on managing waste locally. This full-service approach is vital to our environmental and economic sustainability.

In order to continue to provide these services into the future, the Vernon County Solid Waste Department has begun the permitting process to expand our existing municipal solid waste landfill to continue to provide solid waste services to Vernon County. As part of this process, Wisconsin Statute §289.22 (Local Approval), requires the applicant to submit a written request for the specification of all applicable local approvals to each affected municipality. This formal request is being sent because the Town of Viroqua is considered an "affected municipality" as defined by Wisconsin Statute §298.01(1). Therefore, Vernon County Solid Waste Department hereby requests the Town of Viroqua specify all applicable local approvals that are required for a municipal solid waste facility. If no local approvals are required, please reply with a statement indicating such.

To assist you with this request, the following information regarding the proposed landfill expansion is provided.

Project Description

The proposed landfill expansion will consist of a contiguous horizontal and vertical expansion to the existing landfill currently located within the Town of Viroqua, Vernon County, Wisconsin. The proposed footprint of the horizontal expansion is anticipated to be approximately 4-acres that will extend due east and contiguous with the existing landfill. The expansion will overlay its waste onto the east side of the existing landfill to promote a minimized landfill footprint. The vertical component will extend vertically over the existing footprint resulting in final waste elevations higher than those currently permitted. The proposed expansion will be located on land currently owned by Vernon County and provide approximately 15 years of additional site life.

Owner and Applicant:	Vernon County Solid Waste Department S3705 County Highway LF Viroqua, WI 54665
Facility Type:	Municipal Solid Waste Landfill

Proposed Expansion and Existing Landfill Location:	SE ¼ of the SW ¼ and SW ¼ of the SE ¼ of Section 15, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin
Affected Municipalities:	Town of Viroqua Vernon County

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Please send your written response to this request **within 15 days** of receipt to the contact and address below:

Stacie Sanborn, Solid Waste Director
Vernon County Solid Waste Department
S3705 County Highway LF
Viroqua, WI 54665

Thank you in advance for your attention and cooperation with this matter. We look forward to working with you during this landfill expansion process.

Sincerely

Stacie Sanborn
Solid Waste Director

Attachment – Waste Facility Siting Board Standard Notice

Cc: Wisconsin Waste Facility Siting Board
Vernon County, Clerk
Town of Viroqua, Chairman
Brian Kent, SEH

June 1, 2022

VIA CERTIFIED MAIL
CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Heather Wildenberg
Town Clerk
Town of Viroqua
E8034 County Road LF
Viroqua, WI 54665

RE: Vernon County Landfill
Proposed Solid Waste Landfill Expansion

Dear Heather Wildenberg:

The Vernon County Landfill is the hub of a solid waste management system that serves residents, businesses and industry in Vernon County. Our integrated system provides reuse, recycling and disposal services, in addition to programs designed to reduce the toxicity of various waste streams and provide convenience to system users. The services offered by our system are consistent with the State of Wisconsin's preferred waste management hierarchy, and as a publicly-owned system, we are focused on managing waste locally. This full-service approach is vital to our environmental and economic sustainability.

In order to continue to provide these services into the future, the Vernon County Solid Waste Department has begun the permitting process to expand our existing municipal solid waste landfill to continue to provide solid waste services to Vernon County. As part of this process, Wisconsin Statute §289.22 (Local Approval), requires the applicant to submit a written request for the specification of all applicable local approvals to each affected municipality. This formal request is being sent because the Town of Viroqua is considered an "affected municipality" as defined by Wisconsin Statute §298.01(1). Therefore, Vernon County Solid Waste Department hereby requests the Town of Viroqua specify all applicable local approvals that are required for a municipal solid waste facility. If no local approvals are required, please reply with a statement indicating such.

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Project Description

The proposed landfill expansion will consist of a contiguous horizontal and vertical expansion to the existing landfill currently located within the Town of Viroqua, Vernon County, Wisconsin. The proposed footprint of the horizontal expansion is anticipated to be approximately 4-acres that will extend due east and contiguous with the existing landfill. The expansion will overlay its waste onto the east side of the existing landfill to promote a minimized landfill footprint. The vertical component will extend vertically over the existing footprint resulting in final waste elevations higher than those currently permitted. The proposed expansion will be located on land currently owned by Vernon County and provide approximately 15 years of additional site life.

Owner and Applicant:	Vernon County Solid Waste Department S3705 County Highway LF Viroqua, WI 54665
Facility Type:	Municipal Solid Waste Landfill

Proposed Expansion and Existing Landfill Location:	SE ¼ of the SW ¼ and SW ¼ of the SE ¼ of Section 15, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin
Affected Municipalities:	Town of Viroqua Vernon County

Please find attached the Standard Notice prepared by the State of Wisconsin Waste Facility Siting Board (revised 1/25/2018). Please review the Standard Notice carefully as this serves to inform a municipality of the actions and deadlines required to qualify for participation in negotiations and arbitration concerning the proposed siting of all new or expanded solid or hazardous waste facilities in Wisconsin.

Please send your written response to this request **within 15 days** of receipt to the contact and address below:

Stacie Sanborn, Solid Waste Director
Vernon County Solid Waste Department
S3705 County Highway LF
Viroqua, WI 54665

Thank you in advance for your attention and cooperation with this matter. We look forward to working with you during this landfill expansion process.

Sincerely

Stacie Sanborn
Solid Waste Director

Attachment – Waste Facility Siting Board Standard Notice

Cc: Wisconsin Waste Facility Siting Board
Vernon County, Clerk
Town of Viroqua, Chairman
Brian Kent, SEH

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Chairmen, Town of Virogua
S6385 Lyster Rd
Readstown, WI 54652

9590 9402 6636 1028 8139 61

2. Article Number *(Transfer from service label)*

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A. Signature

X Phil Howitt ☐ Agent ☒ Addressee

B. Received by *(Printed Name)* PHIL HOWITT

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D. Is delivery address different from item 1? ☐ Yes
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Vernon County Solid Waste
33705 County RD LF
Viroqua, WI 54665

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- Certified Mail service is *not* available for international mail.
- Insurance coverage is *not* available for purchase with Certified Mail service. However, the purchase of Certified Mail service does not change the insurance coverage automatically included with certain Priority Mail items.
- For an additional fee, and with a proper endorsement on the mailpiece, you may request the following services:
  - Return receipt service, which provides a record of delivery (including the recipient's signature). You can request a hardcopy return receipt or an electronic version. For a hardcopy return receipt, complete PS Form 3811, *Domestic Return Receipt;* attach PS Form 3811 to your mailpiece; for an electronic return receipt, see a retail associate for assistance. To receive a duplicate return receipt for no additional fee, present this USPS®-postmarked Certified Mail receipt to the retail associate.
  - Restricted delivery service, which provides delivery to the addressee specified by name, or to the addressee's authorized agent.
  - Adult signature service, which requires the signee to be at least 21 years of age (not available at retail).
  - Adult signature restricted delivery service, which requires the signee to be at least 21 years of age and provides delivery to the addressee specified by name, or to the addressee's authorized agent (not available at retail).
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IMPORTANT: Save this receipt for your records.

PS Form **3800,** April 2015 *(Reverse)* PSN 7530-02-000-9047

7021 2720 0002 0281 2411

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.

Viroqua, WI 54665

OFFICIAL USE

Certified Mail Fee $ $3.75	0092 08
Extra Services & Fees (check box, add fee as appropriate) $ $3.05	
☐ Return Receipt (hardcopy) $ $0.00	
☐ Return Receipt (electronic) $ $0.00	Postmark Here
☐ Certified Mail Restricted Delivery $ $0.00	
☐ Adult Signature Required $ $0.00	
☐ Adult Signature Restricted Delivery $	
Postage $ $1.36	
Total Postage and Fees $ $8.16	06/15/2022

Sent To

Street and Apt. No., or PO Box No.

City, State, ZIP+4®

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Clerk, Town of Viroqua
E8034 County Rd LF
Viroqua, WI 54665

9590 9402 6636 1028 8139 54

2. 7021 2720 0002 0281 2411

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Heather Widenberg ☐ Agent ☐ Addressee

B. Received by (Printed Name) Heather Widenberg C. Date of Delivery 6/17/22

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

Certified Mail service provides the following benefits:

- A receipt (this portion of the Certified Mail label).
- A unique identifier for your mailpiece.
- Electronic verification of delivery or attempted delivery.
- A record of delivery (including the recipient's signature) that is retained by the Postal Service™ for a specified period.

Important Reminders:

- You may purchase Certified Mail service with First-Class Mail®, First-Class Package Service®, or Priority Mail® service.
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IMPORTANT: Save this receipt for your records.

PS Form **3800,** April 2015 *(Reverse)* PSN 7530-02-000-9047

USPS TRACKING #

9590 9402 6636 1028 8139 54

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

United States Postal Service

• Sender: Please print your name, address, and ZIP+4® in this box•

Vernon County Solid Waste
[illegible]
S3705 County Rd LF
Viroqua, WI 54665

7021 2720 0002 0281 2404

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.

Viroqua, WI 54665

OFFICIAL USE

Certified Mail Fee $ $3.75	0092 08
Extra Services & Fees *(check box, add fee as appropriate)*	
☐ Return Receipt (hardcopy) $ $0.00	
☐ Return Receipt (electronic) $ $0.00	
☐ Certified Mail Restricted Delivery $ $0.00	Postmark Here
☐ Adult Signature Required $ $0.00	
☐ Adult Signature Restricted Delivery $	
Postage $ $1.36	
Total Postage and Fees $ $8.16	06/15/2022

Sent To

Street and Apt. No., or PO Box No.

City, State, ZIP+4®

PS Form **3800**, April 2015 PSN 7530-02-000-9047 — See Reverse for Instructions

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Vernon County Clerk
400 Courthouse Square
Viroqua, WI 54665

9590 9402 6636 [illegible]

7021 2720 0002 0281 2404

(Service label)

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Nicole J. Nelson ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Nicole J. Nelson

C. Date of Delivery 06-17-22

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ [illegible]ed Mail®
- ☐ [illegible]d Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form **3811**, July 2020 PSN 7530-02-000-9053 — Domestic Return Receipt

Certified Mail service provides the following benefits:

- A receipt (this portion of the Certified Mail label).
- A unique identifier for your mailpiece.
- Electronic verification of delivery or attempted delivery.
- A record of delivery (including the recipient's signature) that is retained by the Postal Service™ for a specified period.

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  - Adult signature restricted delivery service, which requires the signee to be at least 21 years of age and provides delivery to the addressee specified by name, or to the addressee's authorized agent (not available at retail).
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IMPORTANT: Save this receipt for your records.

PS Form **3800,** April 2015 *(Reverse)* PSN 7530-02-000-9047

USPS TRACKING #

SAINT PAUL MN 550
17 JUN 2022 PM 3 L

9590 9402 6636 1028 8139 47

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

United States Postal Service

• Sender: Please print your name, address, and ZIP+4® in this box•

Vernon County Solid Waste
S3705 County RD LF
Viroqua, WI 54665

7021 2720 0002 0281 2398

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.

Madison WI 53705

OFFICIAL USE

Certified Mail Fee $3.75	0092 08
$ $3.05	
Extra Services & Fees *(check box, add fee as appropriate)* $0.00	
☐ Return Receipt (hardcopy) $ $0.00	
☐ Return Receipt (electronic) $ $0.00	Postmark Here
☐ Certified Mail Restricted Delivery $ $0.00	
☐ Adult Signature Required $ $0.00	
☐ Adult Signature Restricted Delivery $	
Postage $1.96	06/15/2022
$	
Total Postage and Fees $8.76	
$	
Sent To	
Street and Apt. No., or PO Box No.	
City, State, ZIP+4®	

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

State of Wisconsin
WFSB
4822 Madison Yards Way
Madison, WI 53705-5400

9590 9402 6636 1028 8139 30

2. Article Number *(Transfer from service label)* 7021 2720 0002 0281 2398

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X POSTAL SERVICES WIS. DEPT OF TRANS. ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* P.O. BOX 7908 MADISON WI 53707 C. Date of Delivery 6/17/22

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

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IMPORTANT: Save this receipt for your records.

PS Form **3800,** April 2015 *(Reverse)* PSN 7530-02-000-9047

USPS TRACKING #

9590 9402 6636 1028 8139 30

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

United States Postal Service

• Sender: Please print your name, address, and ZIP+4® in this box•

Vernon County Solid Waste
S3705 Cty Rd LF
Viroqua, WI 54665

C-2 – Landfill Siting Resolution by the Town Board of Viroqua

RESOLUTION NO: 2023 – 01

Title: LANDFILL SITING RESOLUTION BY THE TOWN BOARD OF VIROQUA

WHEREAS, Vernon County through application is planning to acquire a permit from the Wisconsin Department of Natural Resources (WDNR) to expand a solid waste landfill within the Town of Viroqua, Vernon County, WI., and

WHEREAS, the Town of Viroqua is a municipal jurisdiction within Vernon County, Wisconsin, and

WHEREAS, pursuant to Wisconsin Statute 289.33 has the authority to negotiate directly with the applicant for the landfill permit to settle issues, such as; protection of local property values, traffic, litter, noise, dust and odor concerns, times of operation, payment of host fees, monitoring of neighbors' water supply wells, and numerous other related issues, and

WHEREAS, the Vernon County proposed landfill expansion is located on a parcel of land in the SE1/4 of the SW1/4 and SW1/4 of the SE1/4 of Section 15 within the Town of Viroqua and is subject at minimum to the Town of Viroqua's zoning ordinance as a pre-existing local approval, and

NOW THEREFORE, BE IT RESOLVED by the Town Board of Supervisors for the Town of Viroqua, Vernon County Wisconsin, that the Town of Viroqua requests to negotiate and, if necessary, arbitrate with Vernon County for the proposed landfill expansion and operational use, and

BE IT FURTHER RESOLVED by the Town Board of Supervisors for the Town of Viroqua, Vernon County, Wisconsin, pursuant to Wisconsin Statute 289.33 appoints the following representatives, AnnaJo Doerr, Kathleen Crittenden, Kelvin Rodolfo and William Rice Spann.....

BE IT FURTHER RESOLVED that a copy of this resolution shall be sent to the State of Wisconsin Waste Facility Siting Board within (7) days of passage.

APPROVED AND ADOPTED THIS 16th day of May, 2023, Town Board of Viroqua.

Phil Hewitt, Town Board Chairman

Nathan Campbell, Town Clerk

Voted in favor 3

Voted no 0

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C-3 – WFSB Notifications

State of Wisconsin
Waste Facility Siting Board
4822 Madison Yards Way, 5th Floor,
Madison, WI 53707-7875
Phone: (608) 266-7709
Fax: (608) 264-9885
e-mail: dhamail@wisconsin.gov

Dale Shaver
Chairman

Brian Hayes
Executive Director

March 24, 2023

CERTIFIED MAIL

Town of Viroqua Clerk
Donna Leum
202 N. Main Street
Viroqua WI 54665

Vernon County Clerk
Jerry Pedretti
400 Courthouse Square, Ste 108
Viroqua WI 54665

Re: Vernon County Solid Waste/Recycling
WFSB # 237

Dear Clerks:

On June 1, 2022 the Waste Facility Siting Board received a copy of a written request for a local approval from Vernon County Solid Waste. The filings were sent to the Town of Viroqua Clerk and Vernon County Clerk. However the Board did not receive certified mail receipts until March 17, 2023.

Due to a delay in receiving the certified mail receipts the 60 days to file a statement of economic interest will start as of March 17, 2023. If a municipality wishes to participate in the negotiation-arbitration process, it must adopt a siting resolution and appoint members to the local committee Stats. § 289.33(6)(a). A copy of the siting resolution and the names of the members who are appointed to the committee must be sent to the Waste Facility Siting Board. Each member appointed to a local committee must file a statement of economic interest with the board within **fifteen days of appointment**. A Statement of Economic Interest form can be found on our website at https://doa.wi.gov/Pages/LicensesHearings/DHAWasteFacilitySitingBoard.aspx

Sincerely,

Brian Hayes
Executive Director

cc: Vernon County Solid Waste

State of Wisconsin
Waste Facility Siting Board
4822 Madison Yards Way, 5th Floor,
Madison, WI 53707-7875
Phone: (608) 266-7709
Fax: (608) 264-9885
e-mail: dhamail@wisconsin.gov

Dale Shaver
Chairman

Brian Hayes
Executive Director

June 9, 2023

CERTIFIED MAIL

Town of Viroqua
Phil Hewitt
S6385 Lyster Road
Viroqua, WI 54665

Vernon County Solid Waste
S3705 County Road LF
Viroqua, WI 54665

Re: Vernon County Solid Waste/Recycling
WFSB #235

Dear Parties:

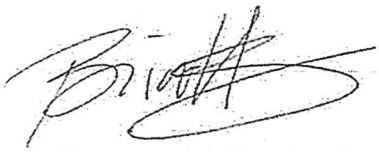
On June 1, 2022 the Waste Facility Siting Board received a copy of a written request for a local approval sent by Vernon County Solid Waste regarding the expansion of its current solid waste landfill facility located within the municipalities. On March 17, 2023 the board was sent certified mail receipts, thus completing the filing with the board.

The statute allows an affected municipality to participate in the negotiation process if the governing body adopts a siting resolution and appoints members to the local committee within 60 days after the municipality receives written requests by the applicant. Wis. Stat. § 289.33(6)(a). On May 16, 2023 the town of Viroqua held a special town board meeting to adopt a sitting resolution.

In this case, the Town of Viroqua was the only affected municipality to timely notify the Waste Facility Siting Board stating their intent to negotiate and, if necessary, arbitrate with Vernon County Solid Waste concerning its facility. In addition, the Town of Viroqua has appointed Kathleen Crittenden, Kelvin Rodolfo, Anna Jo Doerr and William Rice Spann to their local committee. Each of these individuals has timely completed and filed a statement of economic interest.

As a result, pursuant to law, negotiations may begin. If you have questions, please don't hesitate to contact me.

Sincerely,



Brian Hayes
Executive Director

CC: Town of Viroqua Clerk
County of Vernon Clerk

Appendix D

Annual Reports, Inspection Reports, and Compliance Reports

D-1 – 2022 Annual Report Letter
D-2 – WDNR Inspection Reports (2019-2022)
D-3 – WDNR Notice of Noncompliance (2021-2022)
D-4 – WDNR Return to Compliance Letter 2022
D-5 – WDNR Inspection (8-2023) and Letter of Noncompliance

D-1 – 2022 Annual Report Letter

Vernon County
WISCONSIN

Solid Waste & Recycling Department

S3705 County Road LF, Viroqua, WI 54665
Phone:(608) 634-2900
Fax:(608) 634-2899
stacie.sanborn@vernoncounty.org

June 6th, 2023

Colin Maus, Waste Management Engineer
Wisconsin Department of Natural Resources
South Central Region
3911 Fish Hatchery Road,
Fitchburg, WI 53711

Subject: 2022 Annual Report required in s. NR506.105(4), Wis. Adm. Code and Conditional Plan of Operation Approval Modification for the Vernon County Sanitary Balefill, Town of Viroqua, Vernon County, License No. 3268

Dear Mr. Maus:

As established in the Conditional Plan of Operation Approval Modification, section 16 for the Vernon County Sanitary Balefill Landfill (License #3268) approved on June 25th, 2020 the Vernon County Solid Waste & Recycling Department would like to submit the following as the annual report required in s. NR 506.105(4), Wis. Adm. Code:

During the calendar year of 2022, the Vernon County Sanitary Balefill Landfill (License #3268) did not accept any untreated contaminated unconsolidated materials subject to NR 506.105(4), Wis. Adm. Code.

Stacie Sanborn, Director
Vernon County Solid Waste & Recycling Department
S3705 County Road LF,
Viroqua, WI 54665
608.634.2900

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D-2 – WDNR Inspection Reports (2019-2022)

LANDFILL FACILITY INSPECTION FORM - GENERAL

VERNON CNTY SOLID WASTE/RECYCLING FACILITY

Contact Date: 11/15/2019 FID No: 663038310 EPA No: WID988642187 LIC/RU/RA No: 3268 FIST SEQ #: 67673

Revision: 10/04//12

WASTE & MATERIALS MANAGEMENT PROGRAM

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 1: General Facility Requirements

A. Sign posted which indicates the landfill name, license number, hours of operation, waste types accepted, and penalty for unauthorized use.	C	506.07(1)(L)
B. Gate area clean and no solid waste indiscriminately dumped in area.	C	506.07(1)(k)
C. Provisions made to confine windblown material within the active disposal area. there is still windblown material	C	506.07(1)(b)
D. Reasonable effort made to collect windblown materials deposited beyond the active area at the end of the day. On road to the closed demo there is a fair amount of windblown material	C	506.07(1)(c)
E. Fugitive dust controlled in accordance with NR 415.04 from all areas of the landfill.	C	506.07(1)(n)
F. Storm water diverted away from fill areas and temporary measures used to trap sediment.	C	506.07(2)(a)
G. Any liquid which comes in contact with waste or accumulates where active waste disposal operations are occurring handled as leachate and properly managed.*	C	506.07(5)(b)
H. Daily disposal of solid waste confined to as small an area as practical.	C	506.07(1)(a)
I. Municipal solid waste and non-high-volume industrial solid waste covered at the end of operating day with at least 6 inches of daily cover. *	C	506.05
J. Areas not receiving waste for 6 months covered with one foot of fine grained intermediate cover. *	C	506.06
K. Putrescible materials immediately compacted and covered. non observed	NI	506.07(1)(d)

Section 2: Absence of Prohibited Recyclables

A. Lead acid batteries are not disposed of.	C	506.095(1)
B. Major appliances are not disposed of.	C	506.095(2)
C. Waste oil or materials containing free flowing waste oil are not disposed of.	C	506.095(3)
D. Yard waste is not disposed of.	C	506.095(4)
E. Wisconsin mandated recycling materials from a region without an effective program are not disposed of.	C	506.095(5)
F. Wisconsin mandated recycling materials that have been seperated for recycling are not disposed of (follow up with Department regional recycling contact).	C	506.095(6)
G. Electronics are not disposed of (after September 1, 2010).	C	287.07(5)(a)
H. Used oil filters are not disposed of (after January 1, 2011).	C	287.07(4m)
i. Oil absorbent materials are not disposed of unless the waste oil has been drained so that no visible signs of free-flowing oil remain in or on the absorbent materials and the absorbent materials are not hazardous waste.	C	287.07(4m)

LANDFILL FACILITY INSPECTION FORM - GENERAL

VERNON CNTY SOLID WASTE/RECYCLING FACILITY

Contact Date: 11/15/2019 FID No: 663038310 EPA No: WID988642187 LIC/RU/RA No: 3268 FIST SEQ #: 67673

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 3: Solid Waste Program Environmental Management System Initiatives

A. Landfill phase development and closure following approved plan of operation.	**C**	514.06(9)
B. Gas system installation following approved plan of operation.	**ND**	514.06(9)
C. Active gas extraction system operating.	**ND**	504.08(2)
D. Approved landfill gas treatment system operating.	**ND**	504.08(2)

LANDFILL FACILITY INSPECTION FORM - RECORDS SUPPLEMENT

VERNON CNTY SOLID WASTE/RECYCLING FACILITY

Contact Date: 11/15/2019 FID No: 663038310 EPA No: WID988642187 LIC/RU/RA No: 3268 FIST SEQ #: 67673

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates record keeping practices to assess their status and if data is being maintained.

Section 1: General Administrative Requirements

A. Copies of landfill compliance certifications submitted by a certified operator or facility manager.	**C**	506.19(1)
B. Copies of Department approvals, facility submitted plans and operating records kept at the facility. *	**C**	506.17
C. Records of untreated contaminated soil used as alternative daily cover or facility structures: volume, average organic compound concentration, average benzene concentration, and location for each project.	**NI**	506.105(4)(a)
D. Copies of annual financial responsibility adjustments submitted to the Department	**C**	520.05(1)
E. Waste more than 5% of total design capacity analyzed in accordance with NR 506.09(2).	**NI**	506.09(1)&(2)
F. Records of the maximium organic concentrations for untreated contaminted soil accepted for disposal.	**NI**	506.105(3)
G. Records maintained of alternative daily cover materials used at the facility and the ratio to waste disposed.	**NI**	520.14(4)(a)4
I. Summary reports submitted to the Department following each leachate cleanout or inspection event.	**C**	506.07(5)(g)
J. Closure/long-term care cost estimates updated to reflect current design and operations (minimum every 10 years). This needs to be checked	**CA**	520.07(1m)(a)

H. Sludge waste disposal

1. Material test results maintained to document that there are no free liquids.	**NI**	506.14(2)(c)
2. Evaluations for potential special handling or monitoring requirements maintained.	**NI**	506.14(2)(d)
3. Copies of annual reports submitted to Department documenting daily mixing ratios and any operational problems.	**NI**	506.14(2)(e)

LANDFILL FACILITY INSPECTION FORM - PERFORMANCE SUPPLEMENT

VERNON CNTY SOLID WASTE/RECYCLING FACILITY

Contact Date: 11/15/2019 FID No: 663038310 EPA No: WID988642187 LIC/RU/RA No: 3268 FIST SEQ #: 67673

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates facility systems (storm water, cover, gas, leachate and environmental monitoring) to assess their status and if data is being maintained.

Section 1: General Performance Requirements

A. Equipment provided to control accidental fires and arrangements with the local fire agency. Needs to be checked	NI	506.07(1)(h)
B. Provisions made for back-up equipment in the event of operating equipment breakdown.	NI	506.07(1)(p)
C. Monitoring and sampling devices protected to prevent contaminant entry and damage. There are a number of compromised monitoring wells. A comprehensive evaluation of the site is needed.	CA	507.04(3)
D. All monitoring devices clearly and permanently labeled on the outside of the device.* As noted above	CA	507.04(4)
E. Intermediate cover vegetated, compacted and sloped no less than 5% and no greater than 33%.	C	506.06
F. Active gas extraction system operating and drawing a vacuum at the extraction well furthest from the blower.	NI	504.08(2)(J)

Section 2: Storm Water Maintenance Requirements

A. Stockpiled soil material that is not anticipated to be used within 6 months seeded.	NI	506.07(1)(r)
B. Storm water drainage ditches, structures and sedimentation basins cleaned and maintained. Main basin has a lot of woody vegetation	CA	506.07(2)(b)
C. Surface water sampling locations surveyed and permanently and clearly marked.	NI	507.23(2)

Section 3: Leachate System Maintenance

A. Vehicle traffic not allowed to travel on granular drainage layer as first lift of waste is being placed.	C	506.07(3)(a)
B. Leachate lines cleaned immediately after construction, and annually thereafter.	C	506.07(5)(c)
C. Leachate removal from all leachate storage structures to maintain gravity flow.	C	506.07(5)(a)
D. Leachate collection lines video inspected every 5 years	C	506.07(5)(e)
E. Leachate collection lines blockages investigated and remedial action proposed.	C	506.07(5)(f)

LANDFILL FACILITY INSPECTION FORM - OPERATIONS SUPPLEMENT

VERNON CNTY SOLID WASTE/RECYCLING FACILITY

Contact Date: 11/15/2019 FID No: 663038310 EPA No: WID988642187 LIC/RU/RA No: 3268 FIST SEQ #: 67673

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates daily procedures and practices to assess if the site is accepting appropriate wastes and handling them properly.

Section 1: General Operating Requirements

A. A certified operator or facility manager present during hours of operation and a list of certified operators or facility managers maintained at the landfill.	C	506.07(1)(i)
B. Scavenging within the active disposal area prohibited.	C	506.07(1)(o)
C. Access roads to active area all-weather construction and maintained in good condition.	C	506.07(1)(s)
D. Access roads used by solid waste hauling trucks constructed with less than 10% grade.	C	506.07(1)(t)

E. Daily Cover

1. Clay soil scarified or removed prior to placement of the next lift of solid waste.	C	506.05(1)
2. Alternate daily cover materials approved for use by Department.	C	506.055
3. Alternate daily cover material on-site storage properly maintained prior to use. appears minimal to none used	NI	506.055(1)(d)
4. Untreated contaminated soil used for alternative cover or facility structures does not impair operation of the landfill, cause windblown problems, ponding of storm water or other nuisance conditions.	NI	506.105(1)(a)2

Section 2: Waste Screening Requirements

1. Random load inspections conducted on every 5,000 tons of waste accepted or one inspection per month *	C	506.16(1)(a)
2. Random load inspection performed by NR 524 certified landfill operator or manager.	C	506.16(3)
3. Non-approved waste rejected and handled according to applicable regulations.	C	506.16(5)
4. Random load inspection records maintained for a minimum of 3 years.	C	506.17

Section 3: Select Waste Handling Requirements

A. Asbestos material disposal

1. Facility is approved for category I, category II and friable asbestos.	C	506.10(1)
2. Category II and friable asbestos disposed in a trench excavated into existing refuse and covered with at least 3 feet of solid waste or soil prior to compaction.*	C	506.10(2)(a)
3. Category II and friable asbestos disposal trench locations recorded by horizontal and vertical coordinates and records maintained at the facility.	C	506.10(2)(b)
4. Category II and friable asbestos not placed in previous asbestos disposal areas or areas proposed for future structures in the landfill.	C	506.10(2)(c)

B. Untreated contaminated soil disposal

1. Untreated soil disposed in compliance with NR 419.07 air management non-attainment requirements	NI	506.105

C. Municipal solid waste ash disposal

1. Wind blown material being prevented.	NI	506.15(3)(a)

Section 3: Select Waste Handling Requirements

C. Municipal solid waste ash disposal

2. Exposed residue area no larger than 50 feet by 100 feet.*	**NI**	506.15(3)(b)
3. Residue covered with a minimum of 6 inches of soil at the end each day.*	**NI**	506.15(3)(c)
4. Filled areas, other than the active disposal area, covered with soil or alternative cover*	**C**	506.15(3)(d)

LANDFILL FACILITY INSPECTION FORM - GENERAL

VERNON CNTY SOLID WASTE/RECYCLING FACILITY

Contact Date: 11/18/2020 FID No: 663038310 EPA No: WID988642187 LIC/RU/RA No: 3268 FIST SEQ #: 69903

Revision: 10/05//20

WASTE & MATERIALS MANAGEMENT PROGRAM

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 1: General Facility Requirements

A. Sign posted which indicates the landfill name, license number, hours of operation, waste types accepted, and penalty for unauthorized use.	**C**	506.07(1)(L)
B. Gate area clean and no solid waste indiscriminately dumped in area.	**C**	506.07(1)(k)
C. Provisions made to confine windblown material within the active disposal area. Additonal measures need to be implemented.	**CA**	506.07(1)(b)
D. Reasonable effort made to collect windblown materials deposited beyond the active area at the end of the day. As noted above addtional patrolling of the site and means to capture the materials are necessary	**CA**	506.07(1)(c)
E. Fugitive dust controlled in accordance with NR 415.04 from all areas of the landfill.	**C**	506.07(1)(n)
F. Storm water diverted away from fill areas and temporary measures used to trap sediment.	**C**	506.07(2)(a)
G. Any liquid which comes in contact with waste or accumulates where active waste disposal operations are occurring handled as leachate and properly managed.*	**C**	506.07(5)(b)
H. Daily disposal of solid waste confined to as small an area as practical.	**C**	506.07(1)(a)
I. Municipal solid waste and non-high-volume industrial solid waste covered at the end of operating day with at least 6 inches of daily cover. *	**NI**	506.05
J. Areas not receiving waste for 6 months covered with one foot of fine grained intermediate cover. *	**NI**	506.06
K. Putrescible materials immediately compacted and covered.	**NI**	506.07(1)(d)

Section 2: Absence of Prohibited Recyclables

A. Lead acid batteries are not disposed of.	**NI**	506.095(1)
B. Major appliances are not disposed of.	**NI**	506.095(2)
C. Waste oil or materials containing free flowing waste oil are not disposed of.	**NI**	506.095(3)
D. Yard waste is not disposed of.	**NI**	506.095(4)
E. Wisconsin mandated recycling materials from a region without an effective program are not disposed of.	**NI**	506.095(5)
F. Wisconsin mandated recycling materials that have been seperated for recycling are not disposed of (follow up with Department regional recycling contact).	**NI**	506.095(6)
G. Electronics are not disposed of (after September 1, 2010).	**NI**	287.07(5)(a)
H. Used oil filters are not disposed of (after January 1, 2011).	**NI**	287.07(4m)
i. Oil absorbent materials are not disposed of unless the waste oil has been drained so that no visible signs of free-flowing oil remain in or on the absorbent materials and the absorbent materials are not hazardous waste.	**NI**	287.07(4m)

Section 3: Solid Waste Program Environmental Management System Initiatives

A. Landfill phase development and closure following approved plan of operation.	**C**	514.06(9)
B. Gas system installation following approved plan of operation.	**NE**	514.06(9)
C. Active gas extraction system operating.	**NE**	504.08(2)
D. Approved landfill gas treatment system operating.	**NE**	504.08(2)

LANDFILL FACILITY INSPECTION FORM - GENERAL

VERNON CNTY SOLID WASTE/RECYCLING FACILITY

Contact Date: 06/17/2021 FID No: 663038310 EPA No: WID988642187 LIC/RU/RA No: 3268 FIST SEQ #: 71150

Revision: 10/05//20

WASTE & MATERIALS MANAGEMENT PROGRAM

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 1: General Facility Requirements

A. Sign posted which indicates the landfill name, license number, hours of operation, waste types accepted, and penalty for unauthorized use.	C	506.07(1)(L)
B. Gate area clean and no solid waste indiscriminately dumped in area.	C	506.07(1)(k)
C. Provisions made to confine windblown material within the active disposal area. there was some but the efforts to keep it under control are appreciated	C	506.07(1)(b)
D. Reasonable effort made to collect windblown materials deposited beyond the active area at the end of the day.	C	506.07(1)(c)
E. Fugitive dust controlled in accordance with NR 415.04 from all areas of the landfill.		506.07(1)(n)
F. Storm water diverted away from fill areas and temporary measures used to trap sediment.		506.07(2)(a)
G. Any liquid which comes in contact with waste or accumulates where active waste disposal operations are occurring handled as leachate and properly managed.*	C	506.07(5)(b)
H. Daily disposal of solid waste confined to as small an area as practical. the open are while not large also ddn't have much daily cover so hard to judge	CA	506.07(1)(a)
I. Municipal solid waste and non-high-volume industrial solid waste covered at the end of operating day with at least 6 inches of daily cover. *	C	506.05
J. Areas not receiving waste for 6 months covered with one foot of fine grained intermediate cover. *	C	506.06
K. Putrescible materials immediately compacted and covered.	C	506.07(1)(d)

Section 2: Absence of Prohibited Recyclables

A. Lead acid batteries are not disposed of. none observed	C	506.095(1)
B. Major appliances are not disposed of. none observed	C	506.095(2)
C. Waste oil or materials containing free flowing waste oil are not disposed of. not observed	C	506.095(3)
D. Yard waste is not disposed of.	C	506.095(4)
E. Wisconsin mandated recycling materials from a region without an effective program are not disposed of.	C	506.095(5)
F. Wisconsin mandated recycling materials that have been seperated for recycling are not disposed of (follow up with Department regional recycling contact).	C	506.095(6)
G. Electronics are not disposed of (after September 1, 2010).	C	287.07(5)(a)
H. Used oil filters are not disposed of (after January 1, 2011).	C	287.07(4m)
i. Oil absorbent materials are not disposed of unless the waste oil has been drained so that no visible signs of free-flowing oil remain in or on the absorbent materials and the absorbent materials are not hazardous waste.	C	287.07(4m)

LANDFILL FACILITY INSPECTION FORM - GENERAL

VERNON CNTY SOLID WASTE/RECYCLING FACILITY

Contact Date: 06/17/2021 FID No: 663038310 EPA No: WID988642187 LIC/RU/RA No: 3268 FIST SEQ #: 71150

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 3: Solid Waste Program Environmental Management System Initiatives

A. Landfill phase development and closure following approved plan of operation.	**C**	514.06(9)
B. Gas system installation following approved plan of operation.	**C**	514.06(9)
C. Active gas extraction system operating. na but will be needed with the organic stability plan	**NA**	504.08(2)
D. Approved landfill gas treatment system operating. na but will be needed witht eh organic stability plan	**NA**	504.08(2)

LANDFILL FACILITY INSPECTION FORM - OPERATIONS SUPPLEMENT

VERNON CNTY SOLID WASTE/RECYCLING FACILITY

Contact Date: 06/17/2021 FID No: 663038310 EPA No: WID988642187 LIC/RU/RA No: 3268 FIST SEQ #: 71150

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates daily procedures and practices to assess if the site is accepting appropriate wastes and handling them properly.

Section 1: General Operating Requirements

A. A certified operator or facility manager present during hours of operation and a list of certified operators or facility managers maintained at the landfill.		506.07(1)(i)
B. Scavenging within the active disposal area prohibited.	C	506.07(1)(o)
C. Access roads to active area all-weather construction and maintained in good condition.	C	506.07(1)(s)
D. Access roads used by solid waste hauling trucks constructed with less than 10% grade.	C	506.07(1)(t)

E. Daily Cover

1. Clay soil scarified or removed prior to placement of the next lift of solid waste.	NA	506.05(1)
2. Alternate daily cover materials approved for use by Department.	NA	506.055
3. Alternate daily cover material on-site storage properly maintained prior to use.	NA	506.055(1)(d)
4. Untreated contaminated soil used for alternative cover or facility structures does not impair operation of the landfill, cause windblown problems, ponding of storm water or other nuisance conditions.	NA	506.105(1)(a)2

Section 2: Waste Screening Requirements

1. Random load inspections conducted on every 5,000 tons of waste accepted or one inspection per month *	C	506.16(1)(a)
2. Random load inspection performed by NR 524 certified landfill operator or manager.	C	506.16(3)
3. Non-approved waste rejected and handled according to applicable regulations.	C	506.16(5)
4. Random load inspection records maintained for a minimum of 3 years.	C	506.17

Section 3: Select Waste Handling Requirements

A. Asbestos material disposal

1. Facility is approved for category I, category II and friable asbestos.	C	506.10(1)
2. Category II and friable asbestos disposed in a trench excavated into existing refuse and covered with at least 3 feet of solid waste or soil prior to compaction.*	C	506.10(2)(a)
3. Category II and friable asbestos disposal trench locations recorded by horizontal and vertical coordinates and records maintained at the facility.	C	506.10(2)(b)
4. Category II and friable asbestos not placed in previous asbestos disposal areas or areas proposed for future structures in the landfill.	C	506.10(2)(c)

B. Untreated contaminated soil disposal

1. Untreated soil disposed in compliance with NR 419.07 air management non-attainment requirements	NA	506.105

C. Municipal solid waste ash disposal

1. Wind blown material being prevented.	NA	506.15(3)(a)

LANDFILL FACILITY INSPECTION FORM - OPERATIONS SUPPLEMENT

VERNON CNTY SOLID WASTE/RECYCLING FACILITY

Contact Date: 06/17/2021 FID No: 663038310 EPA No: WID988642187 LIC/RU/RA No: 3268 FIST SEQ #: 71150

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates daily procedures and practices to assess if the site is accepting appropriate wastes and handling them properly.

Section 3: Select Waste Handling Requirements

C. Municipal solid waste ash disposal

2. Exposed residue area no larger than 50 feet by 100 feet.*	**NA**	506.15(3)(b)
3. Residue covered with a minimum of 6 inches of soil at the end each day.*	**NA**	506.15(3)(c)
4. Filled areas, other than the active disposal area, covered with soil or alternative cover*	**NA**	506.15(3)(d)

State of Wisconsin
Department of Natural Resources

Form 4430-5 (R. 03/06)

COMPLIANCE MONITORING AND EVALUATION FORM

A. GENERAL INFORMATION

FIST SEQ #: 72286

Facility Name (current)	FID #	EPA ID #	Case #	Complaint #
VERNON CNTY SOLID WASTE/RECYCLING FACILITY	663038310	WID988642187	72286	

Street/Location	Notification Status
S3705 COUNTY ROAD LF	LANDFILL 50,000-500,000 CU YD

City	Zip Code	County	Type of Contact	Contact Date/Time
VIROQUA	54665-8198	VERNON	FIELD	11/04/2021 00:00

Contact Name/Phone Number		Staff Assigned to Site	Case Close Out Date
GAIL FRIE, SW MGR	(608) 634-2900	HERRICK, MARTIN	

B. FACILITY INSPECTED AS

Inspection Type
LANDFILL 50,000-500,000 CU YD

C. NOTIFICATION CHANGE

Date processed SHWIMS_____, EPA Data System_____

Status Change: Field Verified Status Is

Name Change: Former Name

D. ACTIVITY TYPES

Lic/RU/RA	Staff Person	Lead Program	Activity Type
3268	HERRICK, MARTIN A	SOLID WASTE	COMPLIANCE ACTIVE LANDFILL

E. ACTIONS AND VIOLATIONS

F. CASE CONTACTS

G. COMMENTS

John Morris and Martin Herrick met with Stacie Sanborn to inspect the active MSW landfill

Region Signature(s)	Date Signed	
HERRICK, MARTIN		d_report_main_site_contact_cme_package_f

LANDFILL FACILITY INSPECTION FORM - GENERAL

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 1: General Facility Requirements

A. Sign posted which indicates the landfill name, license number, hours of operation, waste types accepted, and penalty for unauthorized use.	C	506.07(1)(L)
B. Gate area clean and no solid waste indiscriminately dumped in area.	C	506.07(1)(k)
C. Provisions made to confine windblown material within the active disposal area. There is some fencing but it really wasn't in the active area and addtional daily cover would hold the windblown down in teh waste mass.	X	506.07(1)(b)
D. Reasonable effort made to collect windblown materials deposited beyond the active area at the end of the day. There is windblown along the fence line. It is a lot better than previous inpsections but routine operations need to be ramped up to keep the active area small, get daily cover on the waste and maintain it, move portable wind fences as needed and also add extra sections of windfence, reconstruct the waste perimeter fence that has a section knocked down and pick up the debsris along the inside edge on a routine basis.	X	506.07(1)(c)
E. Fugitive dust controlled in accordance with NR 415.04 from all areas of the landfill.	C	506.07(1)(n)
F. Storm water diverted away from fill areas and temporary measures used to trap sediment. The landfill foot print is fully constructed and the side berms are in place so storm water is in the respective channels but some work is need where surface water sheets down to the embankment o the sedimant basin. Work has been done to clean up the stormwater converyances and the semiant basin .	C	506.07(2)(a)
G. Any liquid which comes in contact with waste or accumulates where active waste disposal operations are occurring handled as leachate and properly managed.*	C	506.07(5)(b)
H. Daily disposal of solid waste confined to as small an area as practical. It's small site that rotates active filling around the site to incremntally build it up. Consideratriona has been giving to he filling sequence to route cotnact water toward the middle of the site.	C	506.07(1)(a)
I. Municipal solid waste and non-high-volume industrial solid waste covered at the end of operating day with at least 6 inches of daily cover. * The daily cover needs to improve in quantity, lateral application and its maintenance.	X	506.05
J. Areas not receiving waste for 6 months covered with one foot of fine grained intermediate cover. * Most of the remaining active area recieves waste with in a 6 month period.	C	506.06
K. Putrescible materials immediately compacted and covered. Nothing was detected	C	506.07(1)(d)

Section 2: Absence of Prohibited Recyclables

A. Lead acid batteries are not disposed of. None were observed and batteries are collected at the recyclking facility	C	506.095(1)
B. Major appliances are not disposed of. None were detected and they are colected at the recycling facility. The department's guidance on storing these has been included with this inspection report.	C	506.095(2)
C. Waste oil or materials containing free flowing waste oil are not disposed of. None was observed	C	506.095(3)
D. Yard waste is not disposed of. None was observed.	C	506.095(4)
E. Wisconsin mandated recycling materials from a region without an effective program are not disposed of.	C	506.095(5)
F. Wisconsin mandated recycling materials that have been seperated for recycling are not disposed of (follow up with Department regional recycling contact).	C	506.095(6)

LANDFILL FACILITY INSPECTION FORM - GENERAL

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 2: Absence of Prohibited Recyclables

G. Electronics are not disposed of (after September 1, 2010).	**C**	287.07(5)(a)
H. Used oil filters are not disposed of (after January 1, 2011). They are collected at the recycling facility.	**C**	287.07(4m)
i. Oil absorbent materials are not disposed of unless the waste oil has been drained so that no visible signs of free-flowing oil remain in or on the absorbent materials and the absorbent materials are not hazardous waste. None was observed	**C**	287.07(4m)

Section 3: Solid Waste Program Environmental Management System Initiatives

A. Landfill phase development and closure following approved plan of operation.	**C**	514.06(9)
B. Gas system installation following approved plan of operation. This is being addressed in the organic stability plan and associated requirements	**NA**	514.06(9)
C. Active gas extraction system operating.	**NA**	504.08(2)
D. Approved landfill gas treatment system operating.	**NA**	504.08(2)

LANDFILL FACILITY INSPECTION FORM - RECORDS SUPPLEMENT

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates record keeping practices to assess their status and if data is being maintained.

Section 1: General Administrative Requirements

A. Copies of landfill compliance certifications submitted by a certified operator or facility manager.	**C**	506.19(1)
B. Copies of Department approvals, facility submitted plans and operating records kept at the facility. *	**C**	506.17
C. Records of untreated contaminated soil used as alternative daily cover or facility structures: volume, average organic compound concentration, average benzene concentration, and location for each project. Not usedat the facility	**NA**	506.105(4)(a)
D. Copies of annual financial responsibility adjustments submitted to the Department	**C**	520.05(1)
E. Waste more than 5% of total design capacity analyzed in accordance with NR 506.09(2). No unique waste streams are equal to or greater than the 5% criteria.	**NA**	506.09(1)&(2)
F. Records of the maximium organic concentrations for untreated contaminted soil accepted for disposal. Material not accepted	**NA**	506.105(3)
G. Records maintained of alternative daily cover materials used at the facility and the ratio to waste disposed. ADC to date have not been accepted	**NA**	520.14(4)(a)4
I. Summary reports submitted to the Department following each leachate cleanout or inspection event. The summaries need to be submitted. Electronically is OK.	**X**	506.07(5)(g)
J. Closure/long-term care cost estimates updated to reflect current design and operations (minimum every 10 years).	**C**	520.07(1m)(a)

H. Sludge waste disposal

1. Material test results maintained to document that there are no free liquids. Not accepted	**NA**	506.14(2)(c)
2. Evaluations for potential special handling or monitoring requirements maintained. Not accepted	**NA**	506.14(2)(d)
3. Copies of annual reports submitted to Department documenting daily mixing ratios and any operational problems. Not accepted	**NA**	506.14(2)(e)

LANDFILL FACILITY INSPECTION FORM - PERFORMANCE SUPPLEMENT

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates facility systems (storm water, cover, gas, leachate and environmental monitoring) to assess their status and if data is being maintained.

Section 1: General Performance Requirements

A. Equipment provided to control accidental fires and arrangements with the local fire agency. Viroqua fire department is familiar with the facility and extra daily cover is available	C	506.07(1)(h)
B. Provisions made for back-up equipment in the event of operating equipment breakdown.	C	506.07(1)(p)
C. Monitoring and sampling devices protected to prevent contaminant entry and damage. Recent evaluation the monitoring wells and repair made as needed.	C	507.04(3)
D. All monitoring devices clearly and permanently labeled on the outside of the device.*	C	507.04(4)
E. Intermediate cover vegetated, compacted and sloped no less than 5% and no greater than 33%.	C	506.06
F. Active gas extraction system operating and drawing a vacuum at the extraction well furthest from the blower.	NA	504.08(2)(J)

Section 2: Storm Water Maintenance Requirements

A. Stockpiled soil material that is not anticipated to be used within 6 months seeded. None at this time	NA	506.07(1)(r)
B. Storm water drainage ditches, structures and sedimentation basins cleaned and maintained. Stormwater conveyance and sed basin have been grubbed out and looked good.	C	506.07(2)(b)
C. Surface water sampling locations surveyed and permanently and clearly marked.	NI	507.23(2)

Section 3: Leachate System Maintenance

A. Vehicle traffic not allowed to travel on granular drainage layer as first lift of waste is being placed. The site has a minimumof 20 feet or more of waste has placed on all liner sections	C	506.07(3)(a)
B. Leachate lines cleaned immediately after construction, and annually thereafter. As-built provided leach lin claeanin information. And records review showed the line cleaning.	C	506.07(5)(c)
C. Leachate removal from all leachate storage structures to maintain gravity flow.	C	506.07(5)(a)
D. Leachate collection lines video inspected every 5 years	C	506.07(5)(e)
E. Leachate collection lines blockages investigated and remedial action proposed.	C	506.07(5)(f)

LANDFILL FACILITY INSPECTION FORM - OPERATIONS SUPPLEMENT

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates daily procedures and practices to assess if the site is accepting appropriate wastes and handling them properly.

Section 1: General Operating Requirements

A. A certified operator or facility manager present during hours of operation and a list of certified operators or facility managers maintained at the landfill.	**C**	506.07(1)(i)
B. Scavenging within the active disposal area prohibited.	**C**	506.07(1)(o)
C. Access roads to active area all-weather construction and maintained in good condition.	**C**	506.07(1)(s)
D. Access roads used by solid waste hauling trucks constructed with less than 10% grade. its close to the 10 % but it is very short.	**C**	506.07(1)(t)

E. Daily Cover

1. Clay soil scarified or removed prior to placement of the next lift of solid waste.	**NA**	506.05(1)
2. Alternate daily cover materials approved for use by Department.	**NA**	506.055
3. Alternate daily cover material on-site storage properly maintained prior to use.	**NA**	506.055(1)(d)
4. Untreated contaminated soil used for alternative cover or facility structures does not impair operation of the landfill, cause windblown problems, ponding of storm water or other nuisance conditions.	**NA**	506.105(1)(a)2

Section 2: Waste Screening Requirements

1. Random load inspections conducted on every 5,000 tons of waste accepted or one inspection per month *	**C**	506.16(1)(a)
2. Random load inspection performed by NR 524 certified landfill operator or manager.	**C**	506.16(3)
3. Non-approved waste rejected and handled according to applicable regulations.	**C**	506.16(5)
4. Random load inspection records maintained for a minimum of 3 years.	**C**	506.17

Section 3: Select Waste Handling Requirements

A. Asbestos material disposal

1. Facility is approved for category I, category II and friable asbestos.	**C**	506.10(1)
2. Category II and friable asbestos disposed in a trench excavated into existing refuse and covered with at least 3 feet of solid waste or soil prior to compaction.* Asbestos is in a dedicated area that recieves minimal amounts of materials should be covered daily.	**X**	506.10(2)(a)
3. Category II and friable asbestos disposal trench locations recorded by horizontal and vertical coordinates and records maintained at the facility.	**C**	506.10(2)(b)
4. Category II and friable asbestos not placed in previous asbestos disposal areas or areas proposed for future structures in the landfill.	**CA**	506.10(2)(c)

B. Untreated contaminated soil disposal

1. Untreated soil disposed in compliance with NR 419.07 air management non-attainment requirements	**NA**	506.105

LANDFILL FACILITY INSPECTION FORM - OPERATIONS SUPPLEMENT

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates daily procedures and practices to assess if the site is accepting appropriate wastes and handling them properly.

Section 3: Select Waste Handling Requirements

C. Municipal solid waste ash disposal

1. Wind blown material being prevented. Not accepted	NA	506.15(3)(a)
2. Exposed residue area no larger than 50 feet by 100 feet.*	NA	506.15(3)(b)
3. Residue covered with a minimum of 6 inches of soil at the end each day.*	NA	506.15(3)(c)
4. Filled areas, other than the active disposal area, covered with soil or alternative cover*	NA	506.15(3)(d)

Key : C or EV: Evaluated - no noncompliance detected at the time of inspection CA: Compliance with Concern R: Returned to Compliance X or V: Non-Compliance
Y: Yes N: No UN: Unknown NA: Inspected, Not Applicable NE: Evaluation Determination will be Made at a Later Date NI: Not Inspected
*: Dept. approved alternate may apply No 'box' is an open ended question ND: Inspected, Not Determined

d_report_sub_cme_package_inspection_ff

SITE PHOTOS

Photo # 83686 Photo 1 of 18

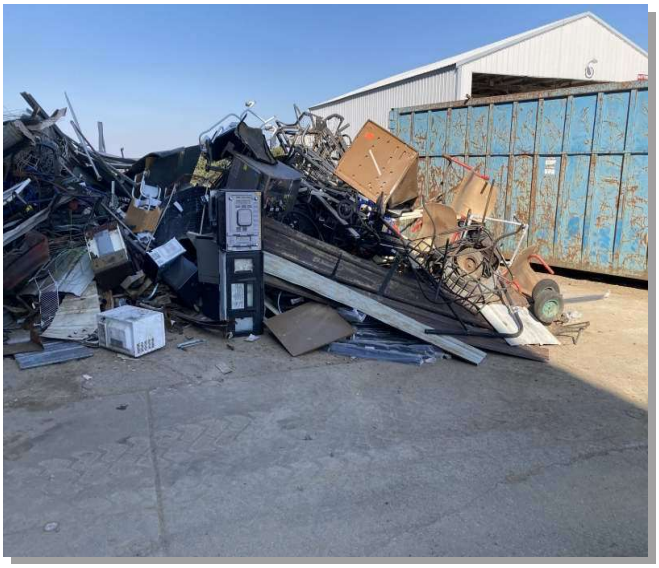
Photo Date & Time

Photo Direction

Photographer

Photo Description

Scrap metal but has some electronics in it



SITE PHOTOS

Photo # 83687 Photo 2 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Mattresses ready to be shipped out



Photo # 83688 Photo 3 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Electronics that need to be stored to prevent contact water



Photo # 83689 Photo 4 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Tire pile is less than a truckload



SITE PHOTOS

Photo # 83690 Photo 5 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Appliances should also be stored to prevent contact water



Photo # 83691 Photo 6 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

example of well llabelled and locked



Photo # 83692 Photo 7 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

SITE PHOTOS

Photo # 83694 Photo 8 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Baled egg cartons



Photo # 83695 Photo 9 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Flourescent bulbs



Photo # 83696 Photo 10 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Battery's



SITE PHOTOS

Photo # 83697 Photo 11 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Baled Plastic

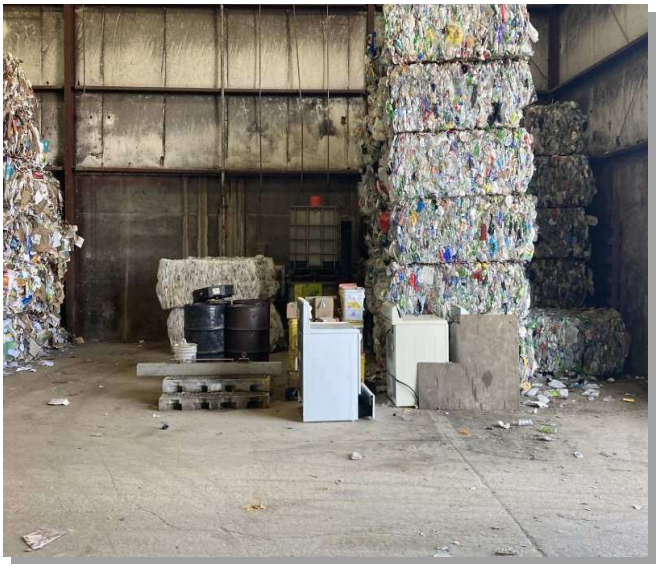


Photo # 83698 Photo 12 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Baled cardboard



Photo # 83699 Photo 13 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Portion of site with final cap installled



SITE PHOTOS

Photo # 83700 Photo 14 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Stormwater conveyance brushed out



Photo # 83701 Photo 15 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Sed basin brushed out



Photo # 83702 Photo 16 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Blown out section of perimeter fence where surface water blows through it. Culvert or energy dissipator strucure should be set up.



SITE PHOTOS

Photo # 83703 Photo 17 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Area where interim cover was ripped off to add extra waste.



Photo # 83704 Photo 18 of 18

Photo Date & Time

Photo Direction

Photographer

Photo Description

Excess interim cover placed on perimeter



State of Wisconsin
Department of Natural Resources

Form 4430-5 (R. 03/06)

COMPLIANCE MONITORING AND EVALUATION FORM

A. GENERAL INFORMATION

FIST SEQ #: 73545

Facility Name (current)	FID #	EPA ID #	Case #	Complaint #
VERNON COUNTY LANDFILL	663038310		73545	

Street/Location	Notification Status
CTY RD LF	

City	Zip Code	County	Type of Contact	Contact Date/Time
VIROQUA	-	VERNON	FIELD	06/20/2022 00:00

Contact Name/Phone Number	Staff Assigned to Site	Case Close Out Date
STACIE SANBORN ( ) -	BRESTER, TESS	06/20/2022

B. FACILITY INSPECTED AS

Inspection Type
LANDFILL > 500,000 CU YD

C. NOTIFICATION CHANGE

Date processed SHWIMS_____, EPA Data System_____

Status Change: Field Verified Status Is

Name Change: Former Name

D. ACTIVITY TYPES

Lic/RU/RA	Staff Person	Lead Program	Activity Type
3268	BRESTER, TESS M	SOLID WASTE	COMPLIANCE ACTIVE LANDFILL

E. ACTIONS AND VIOLATIONS

F. CASE CONTACTS

G. COMMENTS

Routine general, performance, records, and operations inspections.

Region Signature(s)



BRESTER, TESS

Date Signed 07/07/2022

SITE NARRATIVE

Narrative:

Tess Brester (DNR) met with Stacie Sanborn (Vernon County [County]) at the Vernon County landfill at approximately 10AM on June 20, 2022, to conduct a routine active, performance, operations, and records inspection of the Vernon County landfill.

Approximately 30,000-60,000 gallons of leachate is hauled weekly to primarily the Sparta wastewater treatment plant with an on-site haul truck. The truck was observed parked under the above head leachate loadout at the time of the inspection. Backup leachate treatment plants include La Crosse and Viroqua wastewater treatment plants. Leachate collection line jetting has not yet occurred for 2022. The County is anticipating televising leachate collection lines in 2022 to further investigate the blockage report in the 2021 jetting report.

No active landfill gas system (vertical gas wells, blower, flare) is installed at the site. The department and the County discussed the installation of the gas extraction system and that it needs to occur in accordance with the 1) Air permit (typically requires gas extraction after 5 years of waste placement in a cell), 2) gas extraction well installation plan/layout (installation of gas wells when waste reaches final grade), and 3) the phasing plan for the landfill (if included due to age of plan of operation). Brester stated she would look into the County's gas well installation plan/layout and phasing plan and would additionally reach out to the assigned Air program regulator and would follow up with the County on this topic.

The perimeter litter fence on the eastern side of the landfill was observed down and collected windblown debris was observed in the down litter fencing. Windblown debris was additionally observed on the eastern exterior sideslope of the landfill. The County explained that the County has recently obtained additional telephone poles to extend the perimeter litter fence to the north. The County is waiting to install the additional telephone poles before the litter fence is repaired. The department and County discussed the need to collect windblown debris on the eastern side of the landfill. Collection of windblown debris will be reinspected during the department's next inspection.

The active area of the landfill was located in the northern portion of the landfill. A pit dug for asbestos waste was located south of the active area and is covered with additional waste at the end of the working day when asbestos waste is accepted at the facility. Animal carcasses are trenched and buried upon acceptance. No ADC materials are currently stockpiled or used at the landfill. Sandy soil is the primary daily cover used.

The northern exterior sideslope of the landfill was observed with uncovered waste berm. The County explained that the area had recently been regraded to prepare for future filling sequences. A trench was excavated just north of the waste berm to contain any runoff that may contact the waste pile. A contractor is scheduled to come later in the week to cover the exposed waste. This area will be reinspected during the department's next inspection. Intermediate cover below the northern waste berm was observed with patchy vegetation; however, no erosion rills were observed on the northern exterior sideslope. During the same time the northern waste berm is covered, the contractor will also regrade the eastern exterior sideslope where severe erosion rills were observed. The eastern exterior sideslope is being regraded to allow for filling to continue in the area. This area will additionally be reinspected to ensure that either the erosion rills are repaired, or the area is regraded for filling.

The department observed groundwater monitoring wells MW-1, MW-1R, MW-1PR, MW-1RZ, MW-2, MW-2P, MW-3, MW-4, MW-6, MW-7, MW-8R, MW-9, MW-10, MW-11, MW-12, MW-13P, MW-14, and MW-14Z; gas probes GP-2R and GP-3; lysimeters LYS-1, LSY-2, and LYS-3. Monitoring devices appeared to be in overall good condition; however, the following repairs are needed:

*Cut down and resurvey the inner PVC pipe for lysimeters 2 and 3. The resurveyed top of PVC pipe elevation should be sent to the department.
*Place clean fill or bentonite in the gap around the protective casings of groundwater monitoring wells MW-10, MW-11, MW-12, and MW-14/14Z.
*Label all leachate cleanouts.

LANDFILL FACILITY INSPECTION FORM - GENERAL

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 1: General Facility Requirements

A. Sign posted which indicates the landfill name, license number, hours of operation, waste types accepted, and penalty for unauthorized use.	**C**	506.07(1)(L)
B. Gate area clean and no solid waste indiscriminately dumped in area.	**C**	506.07(1)(k)
C. Provisions made to confine windblown material within the active disposal area.	**CA**	506.07(1)(b) Photo(s): Y
D. Reasonable effort made to collect windblown materials deposited beyond the active area at the end of the day. Windblown debris was observed around primarily the northeastern and eastern areas surrounding the landfill, including the eastern exterior sideslope. Concentrated windblown was observed collected where the eastern perimeter litter fence was observed unrepaired from the department's last inspection. The department and County discussed collecting the windblown debris, focusing on areas that may become further windblown and leave the landfill property.	**CA**	506.07(1)(c) Photo(s): Y
E. Fugitive dust controlled in accordance with NR 415.04 from all areas of the landfill.	**C**	506.07(1)(n)
F. Storm water diverted away from fill areas and temporary measures used to trap sediment.	**C**	506.07(2)(a)
G. Any liquid which comes in contact with waste or accumulates where active waste disposal operations are occurring handled as leachate and properly managed.*	**C**	506.07(5)(b)
H. Daily disposal of solid waste confined to as small an area as practical.	**C**	506.07(1)(a)
I. Municipal solid waste and non-high-volume industrial solid waste covered at the end of operating day with at least 6 inches of daily cover. * A waste berm area was observed uncovered near the northern exterior sideslope. The County explained that a trench was dug beneath the waste to collect any leachate generated and that a contractor would be on site that week to cover the waste. This area will be reinspected during the department's next inspection for proper coverage of the waste.	**CA**	506.05 Photo(s): Y
J. Areas not receiving waste for 6 months covered with one foot of fine grained intermediate cover. * Intermediate cover was observed on all four exterior sideslopes of the landfill. Intermediate cover on the eastern exterior sideslopes of the landfill was experiencing extensive erosion rills that, if furthered, may expose waste. The County discussed that the contractor that will be onsite to cover the exposed waste on the northern sideslope will also be regrading this area to begin filling. Any areas not being regraded should be inspected for intermediate cover condition and repaired and vegetated.	**CA**	506.06 Photo(s): Y
K. Putrescible materials immediately compacted and covered. Animal carcasses accepted are trenched and buried upon arrival.	**C**	506.07(1)(d)

Section 2: Absence of Prohibited Recyclables

A. Lead acid batteries are not disposed of. Battery drop off area.	**C**	506.095(1)
B. Major appliances are not disposed of. Appliance drop off area.	**C**	506.095(2)
C. Waste oil or materials containing free flowing waste oil are not disposed of. Waste oil drop off area.	**C**	506.095(3)
D. Yard waste is not disposed of. Turned away - no compost site.	**C**	506.095(4)
E. Wisconsin mandated recycling materials from a region without an effective program are not disposed of. Recycling center on site.	**C**	506.095(5)

LANDFILL FACILITY INSPECTION FORM - GENERAL

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 2: Absence of Prohibited Recyclables

F. Wisconsin mandated recycling materials that have been seperated for recycling are not disposed of (follow up with Department regional recycling contact).	**C**	506.095(6)
G. Electronics are not disposed of (after September 1, 2010). Accept for proper disposal at electronics recycler.	**C**	287.07(5)(a)
H. Used oil filters are not disposed of (after January 1, 2011).	**C**	287.07(4m)
i. Oil absorbent materials are not disposed of unless the waste oil has been drained so that no visible signs of free-flowing oil remain in or on the absorbent materials and the absorbent materials are not hazardous waste.	**C**	287.07(4m)

Section 3: Solid Waste Program Environmental Management System Initiatives

A. Landfill phase development and closure following approved plan of operation. Files to determine compliance with the sites phasing plan could not be located due to file transition. This item will be reevaluated once the files can be located.	**NI**	514.06(9)
B. Gas system installation following approved plan of operation. Files to determine compliance with the sites phasing plan could not be located due to file transition. This item will be reevaluated once the files can be located.	**NI**	514.06(9)
C. Active gas extraction system operating.	**NI**	504.08(2)
D. Approved landfill gas treatment system operating.	**NI**	504.08(2)

LANDFILL FACILITY INSPECTION FORM - RECORDS SUPPLEMENT

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates record keeping practices to assess their status and if data is being maintained.

Section 1: General Administrative Requirements

A. Copies of landfill compliance certifications submitted by a certified operator or facility manager. Will check if the certification has been submitted to the regional program assistant or other regional staff.	**NI**	506.19(1)
B. Copies of Department approvals, facility submitted plans and operating records kept at the facility. *	**C**	506.17
C. Records of untreated contaminated soil used as alternative daily cover or facility structures: volume, average organic compound concentration, average benzene concentration, and location for each project. No contaminated soils currently accepted at the facility.	**C**	506.105(4)(a)
D. Copies of annual financial responsibility adjustments submitted to the Department	**C**	520.05(1)
E. Waste more than 5% of total design capacity analyzed in accordance with NR 506.09(2).	**C**	506.09(1)&(2)
F. Records of the maximium organic concentrations for untreated contaminted soil accepted for disposal. No contaminated soils currently accepted at the facility.	**C**	506.105(3)
G. Records maintained of alternative daily cover materials used at the facility and the ratio to waste disposed. No ADC is currently used at the facility.	**C**	520.14(4)(a)4
I. Summary reports submitted to the Department following each leachate cleanout or inspection event. Jetting for 2022 has not occured yet.	**NI**	506.07(5)(g)
J. Closure/long-term care cost estimates updated to reflect current design and operations (minimum every 10 years). Closure last approved in 2015 and LTC last approved in 2021.	**C**	520.07(1m)(a)

H. Sludge waste disposal

1. Material test results maintained to document that there are no free liquids. Sludges are not frequently accepted. Follow special waste plan when they do.	**NI**	506.14(2)(c)
2. Evaluations for potential special handling or monitoring requirements maintained.	**NI**	506.14(2)(d)
3. Copies of annual reports submitted to Department documenting daily mixing ratios and any operational problems.	**NI**	506.14(2)(e)

LANDFILL FACILITY INSPECTION FORM - PERFORMANCE SUPPLEMENT

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates facility systems (storm water, cover, gas, leachate and environmental monitoring) to assess their status and if data is being maintained.

Section 1: General Performance Requirements

A. Equipment provided to control accidental fires and arrangements with the local fire agency. Fire extinguishers on equipment, fire suppression systems	C	506.07(1)(h)
B. Provisions made for back-up equipment in the event of operating equipment breakdown. Can obtain equipment from highway department	C	506.07(1)(p)
C. Monitoring and sampling devices protected to prevent contaminant entry and damage.	CA	507.04(3)
D. All monitoring devices clearly and permanently labeled on the outside of the device.* New labels have been added to the monitoring devices. One label was observed missing and needs to be replaced to properly display the monitoring wells name.	C	507.04(4)
E. Intermediate cover vegetated, compacted and sloped no less than 5% and no greater than 33%. Areas of intermediate cover on the eastern side of the landfill were observed with severe erosion rills. The rills did not appear to be exposing waste. The area will be disturbed later in the week to allow for additional filling in the area. This area will be reinspected during the department's next inspection to check for filling or intermediate cover repair. An area on the northern side of the landfill also had exposed waste that was regraded to allow for filling. The waste is expected to be covered with intermediate cover during the same time the intermediate cover on the eastern side of the landfill is disturbed. This area will additionally be reinspected during the department's next inspection.	CA	506.06
F. Active gas extraction system operating and drawing a vacuum at the extraction well furthest from the blower.	NI	504.08(2)(J)

Section 2: Storm Water Maintenance Requirements

A. Stockpiled soil material that is not anticipated to be used within 6 months seeded. One stockpile located to the west of the landfill.	C	506.07(1)(r)
B. Storm water drainage ditches, structures and sedimentation basins cleaned and maintained.	C	506.07(2)(b)
C. Surface water sampling locations surveyed and permanently and clearly marked.	NI	507.23(2)

Section 3: Leachate System Maintenance

A. Vehicle traffic not allowed to travel on granular drainage layer as first lift of waste is being placed.	NA	506.07(3)(a)
B. Leachate lines cleaned immediately after construction, and annually thereafter.	C	506.07(5)(c)
C. Leachate removal from all leachate storage structures to maintain gravity flow. Haul	C	506.07(5)(a)
D. Leachate collection lines video inspected every 5 years	C	506.07(5)(e)
E. Leachate collection lines blockages investigated and remedial action proposed. The County plans to televise the leachate collection line indicated with a blockage in the 2021 jetting report.	C	506.07(5)(f)

LANDFILL FACILITY INSPECTION FORM - OPERATIONS SUPPLEMENT

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates daily procedures and practices to assess if the site is accepting appropriate wastes and handling them properly.

Section 1: General Operating Requirements

A. A certified operator or facility manager present during hours of operation and a list of certified operators or facility managers maintained at the landfill.	**C**	506.07(1)(i)
B. Scavenging within the active disposal area prohibited.	**C**	506.07(1)(o)
C. Access roads to active area all-weather construction and maintained in good condition.	**C**	506.07(1)(s)
D. Access roads used by solid waste hauling trucks constructed with less than 10% grade.	**C**	506.07(1)(t)

E. Daily Cover

1. Clay soil scarified or removed prior to placement of the next lift of solid waste.	**C**	506.05(1)
2. Alternate daily cover materials approved for use by Department. ADC is not used - sand/soil is primary daily cover.	**C**	506.055
3. Alternate daily cover material on-site storage properly maintained prior to use. No stockpiled ADC was observed on site.	**NI**	506.055(1)(d)
4. Untreated contaminated soil used for alternative cover or facility structures does not impair operation of the landfill, cause windblown problems, ponding of storm water or other nuisance conditions. No biosoil piles are on site.	**NI**	506.105(1)(a)2

Section 2: Waste Screening Requirements

1. Random load inspections conducted on every 5,000 tons of waste accepted or one inspection per month * Random load inspections were not conducted for January or February 2022. Random load inspections must be conducted once a month if tonnage does not require more frequent inspections.	**CA**	506.16(1)(a)
2. Random load inspection performed by NR 524 certified landfill operator or manager.	**C**	506.16(3)
3. Non-approved waste rejected and handled according to applicable regulations.	**C**	506.16(5)
4. Random load inspection records maintained for a minimum of 3 years.	**C**	506.17

Section 3: Select Waste Handling Requirements

A. Asbestos material disposal

1. Facility is approved for category I, category II and friable asbestos. Site has a dedicated pit located near the active area for asbestos that is covered at the end of each day asbestos is accepted.	**C**	506.10(1)
2. Category II and friable asbestos disposed in a trench excavated into existing refuse and covered with at least 3 feet of solid waste or soil prior to compaction.*	**C**	506.10(2)(a)
3. Category II and friable asbestos disposal trench locations recorded by horizontal and vertical coordinates and records maintained at the facility. Pit located is surveyed.	**C**	506.10(2)(b)
4. Category II and friable asbestos not placed in previous asbestos disposal areas or areas proposed for future structures in the landfill.	**C**	506.10(2)(c)

B. Untreated contaminated soil disposal

1. Untreated soil disposed in compliance with NR 419.07 air management non-attainment requirements No contaminated soils currently accepted at the facility.	**C**	506.105

LANDFILL FACILITY INSPECTION FORM - OPERATIONS SUPPLEMENT

This inspection form, when used along with the LANDFILL FACILITY INSPECTION FORM - GENERAL form, evaluates daily procedures and practices to assess if the site is accepting appropriate wastes and handling them properly.

Section 3: Select Waste Handling Requirements

C. Municipal solid waste ash disposal

1. Wind blown material being prevented. No ash accepted.	**NA**	506.15(3)(a)
2. Exposed residue area no larger than 50 feet by 100 feet.*	**NA**	506.15(3)(b)
3. Residue covered with a minimum of 6 inches of soil at the end each day.*	**NA**	506.15(3)(c)
4. Filled areas, other than the active disposal area, covered with soil or alternative cover*	**NA**	506.15(3)(d)

Key : C or EV: Evaluated - no noncompliance detected at the time of inspection CA: Compliance with Concern R: Returned to Compliance X or V: Non-Compliance
Y: Yes N: No UN: Unknown NA: Inspected, Not Applicable NE: Evaluation Determination will be Made at a Later Date NI: Not Inspected
***: Dept. approved alternate may apply No 'box' is an open ended question ND: Inspected, Not Determined**

SITE PHOTOS

Photo # 88070 Photo 1 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction SE

Photographer BRESTER, TESS

Photo Description

Eastern perimeter litter fence observed down with windblown debris collected at the base of the litter fence. The litter fence needs to be repaired and the windblown debris needs to be collected.



Photo # 88071 Photo 2 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction SE

Photographer BRESTER, TESS

Photo Description

Intermediate cover on the eastern exterior sideslope observed partially vegetated with deep erosion rills. The erosion rills did not appear to be exposing waste. The area is anticipated to be disturbed to be used for filling within the next few days.



Photo # 88072 Photo 3 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction AT

Photographer BRESTER, TESS

Photo Description

Groundwater monitoring well MW-2 observed locked, labeled, and appeared to be in good condition.



SITE PHOTOS

Photo # 88073 Photo 4 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction SE

Photographer BRESTER, TESS

Photo Description

Intermediate cover on the western exterior sideslope of the landfill was observed well vegetated and appeared to be in good condition.



Photo # 88074 Photo 5 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction NE

Photographer BRESTER, TESS

Photo Description

Intermediate cover on the western exterior sideslope of the landfill was observed well vegetated and appeared to be in good condition.



Photo # 88075 Photo 6 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction AT

Photographer BRESTER, TESS

Photo Description

Groundwater monitoring well MW-9 observed locked, labeled, and appeared to be in good condition.



SITE PHOTOS

Photo # 88076 Photo 7 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction AT

Photographer BRESTER, TESS

Photo Description

Gas probe GP-2R observed locked, labeled, and appeared to be in good condition.



Photo # 88077 Photo 8 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction AT

Photographer BRESTER, TESS

Photo Description

Leachate cleanout on the northern perimeter of the landfill missing a label. Please label the leachate cleanout.



Photo # 88078 Photo 9 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction AT

Photographer BRESTER, TESS

Photo Description

Leachate cleanout on the northern perimeter of the landfill missing a label. Please label the leachate cleanout.



SITE PHOTOS

Photo # 88079 Photo 10 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction SW

Photographer BRESTER, TESS

Photo Description

Intermediate cover on the western portion of the northern exterior sideslope of the landfill observed with patchy vegetation. No significant erosion rills were observed in this area.



Photo # 88080 Photo 11 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction S

Photographer BRESTER, TESS

Photo Description

Intermediate cover on the central portion of the northern exterior sideslope of the landfill observed vegetated. An uncovered waste berm was observed at the top of northern sideslope. A contractor is scheduled to come to the site this week to cover the exposed waste.



Photo # 88081 Photo 12 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction SE

Photographer BRESTER, TESS

Photo Description

Intermediate cover on the eastern portion of the northern exterior sideslope of the landfill observed vegetated. An uncovered waste berm was observed at the top of northern sideslope. A contractor is scheduled to come to the site this week to cover the exposed waste.



SITE PHOTOS

Photo # 88082 Photo 13 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction SW

Photographer BRESTER, TESS

Photo Description

Above ground leachate tank (left) and haul truck under leachate loadout (right).



Photo # 88083 Photo 14 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction S

Photographer BRESTER, TESS

Photo Description

Force main manhole with passive vent.



Photo # 88084 Photo 15 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction AT

Photographer BRESTER, TESS

Photo Description

Leachate cleanout and other associated leachate conveyance features. Please label the leachate cleanout.



SITE PHOTOS

Photo # 88085 Photo 16 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction AT

Photographer BRESTER, TESS

Photo Description

Lysimeter LYS-3 observed with the inner PVC pipe beginning to heave not allowing the cap to properly lock. The PVC pipe should be cut down and the top of well grade surveyed (this information sent to the department).



Photo # 88086 Photo 17 of 17

Photo Date & Time 06/20/2022 00:00

Photo Direction AT

Photographer BRESTER, TESS

Photo Description

Certified operators and managers.



State of Wisconsin
Department of Natural Resources

Form 4430-5 (R. 03/06)

COMPLIANCE MONITORING AND EVALUATION FORM CASE PACKAGE

A. GENERAL INFORMATION

FIST SEQ #: 73891

Facility Name (current)	FID #	EPA ID #	Case #	Complaint #
VERNON COUNTY LANDFILL	663038310		73891	

Street/Location	Notification Status
CTY RD LF	

City	Zip Code	County	Type of Contact	Contact Date/Time
VIROQUA	-	VERNON	FIELD	08/23/2022 00:00

Contact Name/Phone Number	Staff Assigned to Site	Case Close Out Date
STACIE SANBORN ( ) -	BRESTER, TESS	

B. FACILITY INSPECTED AS

Inspection Type
LANDFILL > 500,000 CU YD

C. NOTIFICATION CHANGE

Date processed SHWIMS_____, EPA Data System_____

Status Change: Field Verified Status Is

Name Change: Former Name

D. ACTIVITY TYPES

Lic/RU/RA	Staff Person	Lead Program	Activity Type
3268	BRESTER, TESS M	SOLID WASTE	COMPLIANCE ACTIVE LANDFILL
3268	COOPER, CAROLYN E	SOLID WASTE	COMPLIANCE
3268	LOURIGAN, JOSEPH J	SOLID WASTE	COMPLIANCE

E. ACTIONS AND VIOLATIONS

Action Date	Action Type	Close Date	SNC	Comments
08/23/2022	NON			

Viol. Type	Action Type	Violation Discovery Date	Action Date	Response Due Date	Actual Compliance Date	Viol. Status Code	Code or Statute Citation	Code or Statute Description
	NON	08/23/2022	08/23/2022	09/30/2022		X	506.05	6" inches dailty cover
	NON	08/23/2022	08/23/2022	09/30/2022		X	506.07(1)(d)	Putrescible materials not covered

F. CASE CONTACTS

G. COMMENTS

Routine active landfill inspection, universal waste inspection, and observation of groundwater monitoring well installation.

Region Signature(s) BRESTER, TESS

Date Signed 09/02/2022

Carolyn Cooper and Joe Lourigan (DNR) met with Stacie Sanborn (Vernon County [County]) and Brian Kent (Short Elliott Hendrickson, Inc. [SEH]) at the Vernon County landfill at approximately 1:00 PM on August 23, 2022 to observe drilling of groundwater monitoring well MW-16. No concerns were observed related to the groundwater monitoring well drilling.

Tess Brester (DNR) met with Stacie Sanborn (Vernon County [County]) and Brian Kent (Short Elliott Hendrickson, Inc. [SEH]) at the Vernon County landfill at approximately 1:30 PM on August 23, 2022.

Brester and Sanborn discussed follow up actions taken since the department's last compliance inspection, which includes:
*Leachate cleanouts have been labeled.
*The northern exterior sideslope that had exposed waste has been graded.
*The eastern exterior sideslope that had severe erosion rills is now the active area of the landfill.
*The eastern permanent litter fence has been repaired and borings for the installation of more litter fence have been completed.
*Holes/divots around groundwater monitoring wells have been repaired.
*Lysimeter tops have been raised to allow the devices to lock properly.
*Groundwater monitoring well MW-8 has been labeled.
*Chicken wire has been placed on the sideslope riser to prevent animals from entering the pipe.

There were two active areas in the landfill during the inspection. The primary active area is located on the eastern sideslope. An additional active area is located in Phase 5 that is primarily accepting bulky waste that will not compact well on sideslopes. The County discussed that they have been out of daily cover and neither active area has been covered. The County has called multiple contractors to bring more daily cover material to the site, but the contractors were unavailable. The DNR requested the County notify the department in writing once daily cover material has begun to be delivered and used on site. A small stockpile of shingles was onsite; however, the size of the stockpile would not be enough to cover both active areas. No asbestos was being accepted during the inspection. The asbestos pit location has not changed since the department's June 20, 2022 inspection.

The DNR, County, and SEH discussed the site's organic stability plan, leachate recirculation plan, and plans to install an active gas extraction system. The DNR discussed that, based on current grades of the landfill, a portion of the gas extraction wells are at final grade and should be installed. Based on review of the current gas extraction system layout in the plan of operation, the current design depicts the blower/flare for the active gas extraction system located on the final cover of the landfill. The DNR, County, and SEH discussed that the gas system will likely need to be modified via a plan modification request to move the blower/flare off of the landfill final cover. Additional modifications may need to be made to the system during that time which can include gas header pipe location and condensate knockout feature location(s).

The DNR stated they would follow up with the County on the interaction of the organic stability plan, leachate recirculation plan, and gas extraction system installation/plan mod.

LANDFILL FACILITY INSPECTION FORM - GENERAL

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 1: General Facility Requirements

A. Sign posted which indicates the landfill name, license number, hours of operation, waste types accepted, and penalty for unauthorized use.	**C**	506.07(1)(L)
B. Gate area clean and no solid waste indiscriminately dumped in area.	**C**	506.07(1)(k)
C. Provisions made to confine windblown material within the active disposal area.	**CA**	506.07(1)(b) Photo(s): Y
D. Reasonable effort made to collect windblown materials deposited beyond the active area at the end of the day.	**CA**	506.07(1)(c) Photo(s): Y
E. Fugitive dust controlled in accordance with NR 415.04 from all areas of the landfill.	**C**	506.07(1)(n)
F. Storm water diverted away from fill areas and temporary measures used to trap sediment.	**C**	506.07(2)(a)
G. Any liquid which comes in contact with waste or accumulates where active waste disposal operations are occurring handled as leachate and properly managed.*	**C**	506.07(5)(b)
H. Daily disposal of solid waste confined to as small an area as practical.	**C**	506.07(1)(a)
I. Municipal solid waste and non-high-volume industrial solid waste covered at the end of operating day with at least 6 inches of daily cover. * Daily cover was not being used prior to the department's inspection and during the department's inspection due to lack of source of material.	**X**	506.05
J. Areas not receiving waste for 6 months covered with one foot of fine grained intermediate cover. *	**C**	506.06
K. Putrescible materials immediately compacted and covered. Daily cover was not being used prior to the department's inspection and during the department's inspection due to lack of source of material.	**X**	506.07(1)(d)

Section 2: Absence of Prohibited Recyclables

A. Lead acid batteries are not disposed of.	**C**	506.095(1)
B. Major appliances are not disposed of.	**C**	506.095(2)
C. Waste oil or materials containing free flowing waste oil are not disposed of.	**C**	506.095(3)
D. Yard waste is not disposed of.	**C**	506.095(4)
E. Wisconsin mandated recycling materials from a region without an effective program are not disposed of.	**C**	506.095(5)
F. Wisconsin mandated recycling materials that have been seperated for recycling are not disposed of (follow up with Department regional recycling contact).	**C**	506.095(6)
G. Electronics are not disposed of (after September 1, 2010).	**C**	287.07(5)(a)

Key : **C or EV: Evaluated - no noncompliance detected at the time of inspection** **CA: Compliance with Concern** **R: Returned to Compliance** **X or V: Non-Compliance**
Y: Yes **N: No** **UN: Unknown** **NA: Inspected, Not Applicable** **NE: Evaluation Determination will be Made at a Later Date** **NI: Not Inspected**
***: Dept. approved alternate may apply** **No 'box' is an open ended question** **ND: Inspected, Not Determined**

LANDFILL FACILITY INSPECTION FORM - GENERAL

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 2: Absence of Prohibited Recyclables

H. Used oil filters are not disposed of (after January 1, 2011).	**C**	287.07(4m)
i. Oil absorbent materials are not disposed of unless the waste oil has been drained so that no visible signs of free-flowing oil remain in or on the absorbent materials and the absorbent materials are not hazardous waste.	**C**	287.07(4m)

Section 3: Solid Waste Program Environmental Management System Initiatives

A. Landfill phase development and closure following approved plan of operation. This item will be evaluated based on the County's response to the issued notice of non-compliance.	**ND**	514.06(9)
B. Gas system installation following approved plan of operation. This item will be evaluated based on the County's response to the issued notice of non-compliance.	**ND**	514.06(9)
C. Active gas extraction system operating. This item will be evaluated based on the County's response to the issued notice of non-compliance.	**ND**	504.08(2)
D. Approved landfill gas treatment system operating. This item will be evaluated based on the County's response to the issued notice of non-compliance.	**ND**	504.08(2)

ASSESSMENT GUIDE FOR ELECTRONIC WASTES, UNIVERSAL WASTE AND USED OIL HANDLERS

This form, used for facilities that provide collection or recycling services for one or more of these materials, evaluates basic material handling requirements. Responses on the form are used by the Department to identify facilities that may require separate follow-up inspections.

Section 1: Electronic Waste: Discarded household electronics: computers, computer accessories, TVs, printers,

A. Are Electronic Wastes stored on-site? If No, go to Section 2. — **Y**

Additional Information Resource: Managing Electronic Wastes Destined for Recycling, DNR Publication WA-1473.

B. Do you have documentation showing that electron wastes have been stored for less than one year? — **Y**

Boxes of e-waste are not labeled with start collection date. The County keeps records of the dates that e-waste is shipped off site.

C. Are all e-wastes stored in a manner that protects them from weather and breakage? — **N**

Collected e-waste is stored outside until enough is collected to place into cardboard boxes/pallets. Once placed in boxes, the e-waste is stored inside a storage building.

D. Are all e-wastes stored so they are secure and inaccessible to the public after hours? — **Y**

E. Are the containers of discarded electronics labeled to identify the contents? — **N**

F. Are the facility employees who handle the discarded electronics trained to prevent breakage and how to clean up any breakage that occurs? — **Y**

Any broken material is cleaned up and placed in a plastic tote until it is included in the e-waste shipments off site to the e-waste recycler.

G. Are any of the electronics de-manufactured or disassembled on site?
Note: Demanufacturing or disassembly means to manually break down e-waste into individual components parts for resale or reuse, or to sort for further recycling. Some components generated by demanufacturing or disassembly are universal wastes (e.g., nickel-cadmium or lithium batteries; fluorescent or other mercury-containing lights, switches or relays.) See Section B - D. — **NA**

H. Do you know where the electronic wastes are sent for processing or recycling? If yes, list the recycler/s: — **Y**

Section 2: Universal Waste Standards - Batteries, NR 673.02: lead-acid automotive, mercuric-oxide (button, some

A. Are spent batteries managed on-site? If No, go to Section 3. — **Y**

Universal Waste rules streamline the requirements for collecting and transporting hazardous waste batteries, certain pesticides, fluorescent and other hazardous waste lamps, mercury containing equipment and antifreeze.

Universal Waste Handler is: a generator of universal waste, or the owner or operator of a facility that receives universal waste from other handlers, accumulates universal waste and sends universal waste to another universal waste handler, destination facility or to a foreign destination. A Universal Waste Handler does not include a person who treats, disposes or recycles universal waste [s. NR 673.09(12)(b), Wis. Adm. Code]. Persons treating, disposing, recycling, or otherwise processing universal wastes are universal waste destination facilities and are subject to applicable hazardous waste regulations.

Additional information resource: Management of Used Batteries, UW Extension Publication SHWEC 710.MK.0002.

B. Are leaking batteries stored in containers that are closed, structurally sound and leak proof? — **Y**

Batteries are stored in plastic cat litter boxes.

C. Do you have documentation showing that batteries been have stored for less than one year? — **Y**

Cat litter boxes are not marked with start collection date, but shipping records are maintained.

D. Are all batteries or containers of batteries labeled or marked "Waste -", "Used -" or "Universal Waste -" batteries? — **N**

E. Do you know where the batteries are sent for processing or recycling? If yes, list recycler/s — **Y**

GlobalTech Environmental

ASSESSMENT GUIDE FOR ELECTRONIC WASTES, UNIVERSAL WASTE AND USED OIL HANDLERS

This form, used for facilities that provide collection or recycling services for one or more of these materials, evaluates basic material handling requirements. Responses on the form are used by the Department to identify facilities that may require separate follow-up inspections.

Section 3: Universal Waste Standards - Mercury Containing Devices, NR 673.04: manometers, switches,

A. Are discarded mercury containing devices managed on-site? If No, go to Section 4. **Additional information resource Management of Mercury Containing Equipment, DNR Publication WA-1004.**	**N**
B. Are leaking mercury containing devices stored in containers that are closed, structurally sound and leak proof?	**NA**
C. Do you have documentation showing that these devices have been stored for less than one year?	**NA**
D. Are the devices or containers labeled or marked "Waste -", "Used -" or "Universal Waste -" followed by the name of the device?	**NA**
E. Do you know where the mercury containing devices sent for processing or recycling If yes, list recycler/s:	**NA**

Section 4: Universal Waste Standards - Lamps, NR 673.05: fluorescent, HID, mercury or sodium vapor.

A. Are discarded lamps managed on-site? If No, go to Section 5. **Additional information resource: Safe Lamp and Bulb Management, DNR Publication WA-195.**	**Y**
B. Are lamps stored in containers that are closed, structurally sound, adequate to prevent breakage and compatible with the contents of the lamps? Lamp Recyclers Inc sends cardboard barrels to the site for lamp disposal. Lamps are stored in other boxes until they are transferred into the cardboard barrels.	**Y**
C. Do you have documentation showing that lamps been stored for less than one year? Shipping records are maintained. Lamp Recyclers Inc additionally collects lamps about every 3 months.	**Y**
D. Are all containers labeled or marked "Waste -", "Used -" or "Universal Waste -" lamps? Cardboard barrels are marked with a Universal Waste stickers. Other boxes used to store lamps are not marked with Universal Waste or start date of collection.	**N**
E. Do you know where the lamps are sent for processing or recycling? If yes, list recycler/s: Lamp Recyclers Inc	**Y**

Section 5: Universal Waste Standards - Antifreeze, used engine coolant, propylene or ethylene glycol.

A. Is used antifreeze managed on-site? If No, go to Section 6. **Additional information resource: Managing Used Antifreeze, DNR Publication WA-356.**	**Y**
B. Is the antifreeze stored in containers that are closed, structurally sound and leak proof?	**Y**
C. Do you have documentation showing that antifreeze has been stored for less than one year?	**Y**
D. Are containers labeled or marked "Used Antifreeze"?	**N**
E. Do you know where the antifreeze is sent for recycling? If yes, list recycler/s:	**UN**

CASE INSPECTION FORM(S)

ASSESSMENT GUIDE FOR ELECTRONIC WASTES, UNIVERSAL WASTE AND USED OIL HANDLERS

This form, used for facilities that provide collection or recycling services for one or more of these materials, evaluates basic material handling requirements. Responses on the form are used by the Department to identify facilities that may require separate follow-up inspections.

Section 6: Used Oil, NR 679 subch C.

A. Is used oil managed on-site? If No, go to Section 7.

If the facility operates a used oil collection center, they may accept used oil from household do-it-yourselfers and farmers or companies who self-transport no more than 55 gallons of used oil at any time. Additional information resource: Used Oil Management, DNR Publication WA-233

Y

B. Are the containers and above-ground tanks labeled with the words "Used Oil"?

Since barrels are not owned by the County, signs may be placed next to the barrels with the appropriate language.

N

C. Are the containers or tanks in good condition and not leaking?

Y

D. Are spills cleaned up promptly, and released used oil and other materials managed properly?

Absorbent socks and oil dry are used in the event of a spill.

Y

E. Do you know where the used oil is sent for processing or recycling? If yes, list recycler/s:

Rock Oil

Y

Section 7: Miscellaneous Information

F. Are there any additional comments or concerns about management practices for the above wastes at this facility? If Yes, describe.

N

Key : **C or EV: Evaluated - no noncompliance detected at the time of inspection** **CA: Compliance with Concern** **R: Returned to Compliance** **X or V: Non-Compliance**
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***: Dept. approved alternate may apply** **No 'box' is an open ended question** **ND: Inspected, Not Determined**

CASE PHOTOS

Photo # 89596 Photo 1 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction W

Photographer COOPER, CAROLYN

Photo Description

Drill rig drilling MW-16.



CASE PHOTOS

Photo # 89597 | Photo 2 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction SE

Photographer BRESTER, TESS

Photo Description

Intermediate cover placed on regraded northern exterior sideslope of the landfill.



Photo # 89598 | Photo 3 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction DOWN

Photographer BRESTER, TESS

Photo Description

Labeled leachate cleanout.



Photo # 89599 | Photo 4 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction SE

Photographer BRESTER, TESS

Photo Description

Intermediate cover placed on regraded northern exterior sideslope of the landfill.



CASE PHOTOS

Photo # 89600 | Photo 5 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction DOWN

Photographer BRESTER, TESS

Photo Description

Labeled leachate cleanout.



Photo # 89601 | Photo 6 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction AT

Photographer BRESTER, TESS

Photo Description

Repair of gap around groundwater monitoring well casing to prevent surface water from entering the well.



Photo # 89602 | Photo 7 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction S

Photographer BRESTER, TESS

Photo Description

Litter fence on the eastern perimeter of the landfill repaired.



CASE PHOTOS

Photo # 89603 | Photo 8 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction S

Photographer BRESTER, TESS

Photo Description

Active area for 'regular' MSW waste on the eastern sideslope with no daily cover.



Photo # 89606 | Photo 9 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction N

Photographer BRESTER, TESS

Photo Description

Litter fence on the eastern perimeter of the landfill repaired.



Photo # 89607 | Photo 10 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction E

Photographer BRESTER, TESS

Photo Description

Section of litter fence down where new groundwater monitoring well nest will be installed. Litter has been cleaned up in this area.



CASE PHOTOS

Photo # 89609 | Photo 11 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction AT

Photographer BRESTER, TESS

Photo Description

Chicken wire added around sideslope riser to prevent animals from entering the sideslope riser pipe.



Photo # 89611 | Photo 12 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction NW

Photographer BRESTER, TESS

Photo Description

Second active area for bulky waste on the western portion of the landfill with no daily cover.



Photo # 89612 | Photo 13 of 13

Photo Date & Time 08/23/2022 00:00

Photo Direction NE

Photographer BRESTER, TESS

Photo Description

Top of 'regular' MSW waste disposal area with no daily cover.



D-3 – WDNR Notice of Noncompliance (2021-2022)

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
LaCrosse Service Center
3550 Mormon Coulee Road
La Crosse WI 54601

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

December 2, 2021

File Ref: FID 663038310
Vernon
SW / CMEL

Stacie Sanborn, Solid Waste Manager
Vernon County Solid Waste/Recycling Facility
S3705 County Road Lf
Viroqua, Wisconsin 54665 8198

Subject: Notice of Noncompliance (NON) at the Vernon County Solid Waste/Recycling Facility

Dear Stacie Sanborn:

Enclosed are copies of the inspection forms and the 18 photos that were completed for Vernon County Solid Waste/Recycling Facility located at S3705 County Road Lf, Viroqua, Wisconsin 54665 on November 4, 2021.

The inspection indicated that, at the time of the inspection, Vernon County Solid Waste/Recycling Facility was not in compliance with the solid waste compliance at active landfills requirements of Chapters NR 500 to 538, Wisconsin Administrative Code.

Identified below are the five alleged areas of noncompliance with Chapters NR 500 to 538, Wisconsin Administrative Code. and the actions you should take to resolve these alleged areas of noncompliance. The inspection forms identified one item that was not inspected (NI). Since the item was not inspected a compliance determination was not made.

Alleged Areas of Noncompliance

1. Failure to have provisions to keep the windblown material confined within the active area as required by s. NR 506.07(1)(b) and (c), Wis. Adm. Code. The site inspection showed there is some fencing, but it really wasn't in the active area and additional daily cover would hold the windblown down in the waste mass.
To be in compliance with this requirement please ensure that the existing provisions are able to keep windblown material confined within the active area.

2. Failure to cover municipal solid waste at the end of each operating day with at least 6 inches of daily cover as required by s. NR 506.05, Wis. Adm. Code. The site inspection showed the daily cover needs to improve in quantity, lateral application and its maintenance.

To be in compliance with this requirement at the end of each operating day cover the municipal solid waste with at least 6 inches of daily cover.

3. Section 506.10(2)(a), Wis. Adm. Code. Asbestos is in a dedicated area however; it should be covered daily.

4. Failure to take reasonable effort to collect and dispose of all windblown material at the end of each operating day as required by s. NR 506.07(1)(c), Wis. Adm. Code. The site inspection showed there is windblown along the fence line. It is a lot better than previous inspections, but routine operations need to be ramped up to keep the

active area small, get daily cover on the waste and maintain it, move portable wind fences as needed, and also add extra sections of wind fence, reconstruct the waste perimeter fence that has a section knocked down and pick up the debris along the inside edge on a routine basis.

To be in compliance with this requirement, at the end of each operating day, all windblown material shall be collected and properly disposed of in the active area unless you established, to the satisfaction of the Department, that all windblown material cannot be collected using reasonable efforts, because of conditions beyond your control, and windblown material which can be collected using reasonable effort has been collected and properly disposed and nuisance conditions do not exist.

5. Section 506.07(5)(g) Reports for leachate collection line cleanout/inspection need to be submitted to the department; electronic submittal is acceptable.

Areas of Concern / Other

Please note that the department did not inspect the Universal waste recycling activities for your facility and an inspection will be performed in the near future by Troy Gansluckner, Waste Management Specialist - Baldwin service center. Two guidance documents (WA-1307, and WA-1736) have been attached to assist you in the management of these materials.

The department recommends you take immediate action to address the identified areas of noncompliance and requests that you provide written documentation of the corrective actions taken along with their implementation dates within 30 days of the date of this letter. While we appreciate receiving your plan by this date, please understand that you are currently in noncompliance and will remain in noncompliance until all identified areas are addressed. Failure to respond in a timely manner may result in escalated enforcement actions. Please note that Chapters NR 500 to 538 Wisconsin Administrative Code are available on the Department's website at http://dnr.wi.gov/topic/Waste/Laws.html .

Thank you for your cooperation and please contact John Morris, Regional Program Supervisor at 715-210-0797, or john.moris@wisconsin.gov for further assistance in the future.

Sincerely,

Martin Herrick,
West Central Region

cc: WC Facility File
Troy Gansluckner (email)

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
2984 Shawano Avenue
Green Bay, WI 54313

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

September 2, 2022

FID 663038310
Vernon County
SW / Correspondence

Stacie Sanborn
Administrator, Vernon County SW/R
S3705 County Road LF,
Viroqua, WI 54665

Subject: August 23, 2022, Vernon County Landfill (Lic. #3268) Compliance Inspection Summary and Notice of Non-Compliance

Dear Ms. Sanborn:

Enclosed is a copy of the Department of Natural Resources' (department's) inspection report for the compliance inspection conducted on August 23, 2022 for the Vernon County (County) landfill. Based on the inspection, the landfill may not be in compliance with applicable solid waste management requirements. The areas of alleged non-compliance are discussed below, along with the actions required.

1. **Section NR 506.05, Wis. Adm. Code, and s. NR 506.07(1)(d), Wis. Adm. Code, require the placement of daily cover or alternative daily cover (ADC) over putrescible materials immediately and at the end of each operating day.**

   During the department's inspection, the County stated that the County was currently out of daily cover material. The department observed two active areas that did not have daily cover applied. On August 26, 2022, the County notified the department via email that daily cover material has been delivered to the site and on August 30, 2022, the department received photos via email of the daily cover being applied to the areas observed open during the department's inspection. While the department has received this information, further evaluation of the site's current daily cover material sources and availability is necessary to ensure that the County will not encounter this issue in the future.

   By September 30, 2022, please provide a plan that outlines actions the County will take to prevent a shortage of daily cover or ADC material at the site in the future. The plan should include a discussion on:

   - The circumstances that led to the daily cover shortage that was observed during the department's August 23, 2022 inspection.
   - The current sources of daily cover and ADC material and the anticipated volume of material from each source.
   - The current volume of daily cover material on site.
   - The anticipated volume of daily cover material that is needed on a daily basis.
   - An anticipated timeline for the current volume of material on site to the volume of material needed for daily cover on a daily basis.

Areas of Concern

2. In addition to the above areas of alleged non-compliance, during the department's inspection, we discussed the implementation of the active gas extraction system. **Section NR 514.07(3)(c), Wis. Adm. Code, requires the components of an active gas extraction system be installed and made operational following attainment of waste final grades. The blower, flare, driplegs, controls, condensate handling, and appurtenances of the gas extraction system must be installed prior to or as part of the attainment of waste final grades within the first phase of waste filling.**

   At the time of the inspection, no portions of the active gas extraction system have been installed. We discussed that the County would likely modify the gas extraction system to move the blower/flare building off of the final cover and potentially re-evaluate the gas extraction system design/layout. Modifications to the approved gas extraction system would require a plan modification request to be reviewed and approved by the department. By September 30, 2022, the County should submit to the department, in writing, a timeline for either submitting a plan modification request to modify the gas extraction system design or provide an evaluation of the current grades of the landfill to the currently approval gas extraction system layout to determine which gas extraction wells areas are at final grades and ready for well installation. A timeline for when these gas extraction wells, blower/flare, and other associated features should additionally be proposed if the current gas extraction system layout will be followed.

3. During the department's June 20, 2022, inspection, the department observed windblown debris that was outside of the waste limits. The department requested that progress be made in collecting the windblown debris. During the department's August 23, 2022, inspection, the department observed progress towards collecting the windblown debris; however, the windblown debris collection was not fully completed. The County needs to continue to make progress towards collecting all windblown debris that is outside of the landfill waste limits. As areas are cleaned, photo documentation of the progress can be sent to the department. The department will inspect for continued improvement of windblown debris collection during the department's next inspection.

While we will appreciate receiving your plan by September 30, 2022, please understand you are in non-compliance and will remain in non-compliance until you fulfill all requirements of ch. NR 506, Wis. Adm. Code.

If you have any questions regarding the attached inspection report or notice of non-compliance, please contact Tess Brester at Tess.Brester@wisconsin.gov or (920) 419-9219. Thank you for your cooperation.

Sincerely,

Tess Brester, P.E.
Waste Management Engineer
Northeast Region

cc: John Morris – DNR/WA (via email)
Carolyn Cooper – DNR/WA (via email)
NER File

Enclosures: August 23, 2022, Inspection Report

D-4 – WDNR Return to Compliance Letter 2022

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
2984 Shawano Avenue
Green Bay, WI 54313

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

October 11, 2022

FID 663038310
Vernon County
SW / Correspondence

Stacie Sanborn
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Subject: Return to Compliance Letter for the September 2, 2022, and December 2, 2021, Notices of Noncompliance for the Vernon County Landfill, Vernon County, Wisconsin, License #3268

Dear Ms. Sanborn:

The department's December 2, 2021, NON letter alleged five areas of noncompliance that were observed during the department's routine compliance inspection conducted on November 4, 2021. On December 14, 2021, and December 30, 2021, the department received emails from Vernon County providing documentation to satisfy compliance with items numbers 2, 3, 4, and 5 of the December 2, 2021, NON. Compliance with item #1 of the December 2, 2021, NON was pending installation of additional litter collection fence on the eastern side of the landfill.

On August 23, 2022, the department conducted a routine inspection of the Vernon County landfill and found one additional area of alleged noncompliance. On September 30, 2022, the department issued an additional NON for the area of noncompliance that requested photo documentation and a narrative discussing preventing the area of noncompliance in the future. On August 30, 2022, Vernon County submitted photo documentation via email. On September 30, 2022, Vernon County submitted a narrative, via email, discussing preventing the area of noncompliance in the future. The September 30, 2022, email and attachment additional included photo documentation verifying compliance with item #1 of the December 2, 2021, NON.

As part of its solid waste regulatory program, the department may perform additional inspections at this facility to ensure compliance with chs. NR 500 to 538, Wis. Adm. Code.

If you have any questions regarding this letter, please contact Tess Brester at Tess.Brester@wisconsin.gov or (920) 419-9219.

Sincerely,

Tess Brester, P.E.
Waste Management Engineer
Northeast Region

cc: John Morris – DNR/WA (via email)
Carolyn Cooper – DNR/WA (via email)
NOR File

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D-5 – WDNR Inspection (8-2023) and Letter of Noncompliance

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg, WI 53711

Tony Evers, Governor
Adam N. Payne, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

August 23, 2023

FID 663038310
Vernon County
SW / Correspondence

Stacie Sanborn
Administrator, Vernon County SW/R
S3705 County Road LF,
Viroqua, WI 54665

Subject: August 10, 2023, Vernon County Landfill (Lic. #3268) Compliance Inspection Summary and Notice of Non-Compliance

Dear Ms. Sanborn:

Enclosed is a copy of the Department of Natural Resources' (department's) inspection report for the compliance inspection conducted on August 10, 2023 for the Vernon County (County) landfill. Based on the inspection, the landfill may not be in compliance with applicable solid waste management requirements. The areas of alleged non-compliance are discussed below, along with the actions required.

Section NR 506.05(1), Wis. Adm. Code, and s. NR 506.07(1)(a), Wis. Adm. Code, require the placement of daily cover or alternative daily cover (ADC) over waste and at the end of each operating day and limiting the waste disposal area to as small an area as practical.

During the department's inspection, the department observed that the landfill did not have daily cover applied and waste was being disposed of throughout the landfill footprint.

By September 30, 2023, please provide the department with narrative and photos showing the landfill having an adequate amount of daily cover over the waste and measures taken to limit the waste disposal area to as small an area as practical.

While we will appreciate receiving the information by September 30, 2023, please understand you are in non-compliance and will remain in non-compliance until you fulfill all requirements of ch. NR 506, Wis. Adm. Code.

If you have any questions regarding the attached inspection report or notice of non-compliance, please contact Colin Maus at Colin.Maus@wisconsin.gov or (608) 516-2462. Thank you for your cooperation.

Sincerely,

Colin Maus

Colin Maus
Waste Management Engineer
South Central Region

cc: Bridget Kelly – DNR/WA (via email)
Tyler Sullivan– DNR/WA (via email)

Enclosures: August 23, 2022, Inspection Report

State of Wisconsin
Department of Natural Resources

Form 4430-5 (R. 03/06)

COMPLIANCE MONITORING AND EVALUATION FORM

A. GENERAL INFORMATION

FIST SEQ #: 75930

Facility Name (current)	FID #	EPA ID #	Case #	Complaint #
VERNON CNTY SOLID WASTE/RECYCLING FACILITY	663038310	WID988642187	75930	

Street/Location	Notification Status
S3705 COUNTY ROAD LF	LANDFILL 50,000-500,000 CU YD

City	Zip Code	County	Type of Contact	Contact Date/Time
VIROQUA	54665-8198	VERNON	FIELD	08/10/2023 00:00

Contact Name/Phone Number		Staff Assigned to Site	Case Close Out Date
GAIL FRIE, SW MGR	(608) 634-2900	MAUS, COLIN	08/10/2023

B. FACILITY INSPECTED AS

Inspection Type
LANDFILL 50,000-500,000 CU YD

C. NOTIFICATION CHANGE

Date processed SHWIMS_____, EPA Data System_____

Status Change: Field Verified Status Is _____

Name Change: Former Name _____

D. ACTIVITY TYPES

Lic/RU/RA	Staff Person	Lead Program	Activity Type
3268	MAUS, COLIN J	SOLID WASTE	COMPLIANCE ACTIVE LANDFILL
3268	SULLIVAN, TYLER J	SOLID WASTE	ASSIST LEAD STAFF

E. ACTIONS AND VIOLATIONS

Action Date	Action Type	Close Date	SNC	Comments
08/10/2023	NON			

Viol. Type	Action Type	Violation Discovery Date	Action Date	Response Due Date	Actual Compliance Date	Viol. Status Code	Code or Statute Citation	Code or Statute Description
	NON	08/10/2023	08/10/2023	09/09/2023		X	506.07(1)(a)	SW confined to small area as practical
	NON	08/10/2023	08/10/2023	09/09/2023		X	506.05	6" inches dailty cover

F. CASE CONTACTS

G. COMMENTS

SITE NARRATIVE

Narrative:

Maus and Sullivan (department) met with Stacie Sanborn of Vernon County at the Vernon County Landfill on August 10, 2023 for a compliance inspection.

The department walked the active area first with Stacie and noticed that no daily cover soils were applied on the landfill. The department discussed the following strategies for limiting the active tipping area:

1. Covering the active area of the landfill with soils to force people to dump only in a small area not covered by soils during operation.
2. Use of cones and signs to direct people to only dump in a certain area.
3. Ensuring that the compactor is not parked in the area where you want dumping to occur.

The department walked the perimeter of the landfill and vegetation was well established onsite.

LANDFILL FACILITY INSPECTION FORM - GENERAL

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 1: General Facility Requirements

A. Sign posted which indicates the landfill name, license number, hours of operation, waste types accepted, and penalty for unauthorized use.	C	506.07(1)(L)
B. Gate area clean and no solid waste indiscriminately dumped in area.	C	506.07(1)(k)
C. Provisions made to confine windblown material within the active disposal area.	C	506.07(1)(b)
D. Reasonable effort made to collect windblown materials deposited beyond the active area at the end of the day.	C	506.07(1)(c)
E. Fugitive dust controlled in accordance with NR 415.04 from all areas of the landfill.	C	506.07(1)(n)
F. Storm water diverted away from fill areas and temporary measures used to trap sediment.	C	506.07(2)(a)
G. Any liquid which comes in contact with waste or accumulates where active waste disposal operations are occurring handled as leachate and properly managed.*	C	506.07(5)(b)
H. Daily disposal of solid waste confined to as small an area as practical.	X	506.07(1)(a)
I. Municipal solid waste and non-high-volume industrial solid waste covered at the end of operating day with at least 6 inches of daily cover. *	X	506.05
J. Areas not receiving waste for 6 months covered with one foot of fine grained intermediate cover. *	C	506.06
K. Putrescible materials immediately compacted and covered.	C	506.07(1)(d)

Section 2: Absence of Prohibited Recyclables

A. Lead acid batteries are not disposed of.	C	506.095(1)
B. Major appliances are not disposed of.	C	506.095(2)
C. Waste oil or materials containing free flowing waste oil are not disposed of.	C	506.095(3)
D. Yard waste is not disposed of.	C	506.095(4)
E. Wisconsin mandated recycling materials from a region without an effective program are not disposed of.	C	506.095(5)
F. Wisconsin mandated recycling materials that have been seperated for recycling are not disposed of (follow up with Department regional recycling contact).	C	506.095(6)
G. Electronics are not disposed of (after September 1, 2010).	C	287.07(5)(a)
H. Used oil filters are not disposed of (after January 1, 2011).	C	287.07(4m)

LANDFILL FACILITY INSPECTION FORM - GENERAL

This inspection form, used for active Municipal or Industrial Solid Waste Landfills, evaluates specific waste program initiatives as well as compliance with select NR 506 operating requirements. LANDFILL ... SUPPLEMENT forms can be used along with this form for more detailed evaluation of minimum operating and performance standards. NR 503 One-time Disposal and C&D landfill inspections do not use this form.

Section 2: Absence of Prohibited Recyclables

i. Oil absorbent materials are not disposed of unless the waste oil has been drained so that no visible signs of free-flowing oil remain in or on the absorbent materials and the absorbent materials are not hazardous waste.	**C**	287.07(4m)

Section 3: Solid Waste Program Environmental Management System Initiatives

A. Landfill phase development and closure following approved plan of operation.	**C**	514.06(9)
B. Gas system installation following approved plan of operation.	**C**	514.06(9)
C. Active gas extraction system operating.	**C**	504.08(2)
D. Approved landfill gas treatment system operating.	**C**	504.08(2)

Key : C or EV: Evaluated - no noncompliance detected at the time of inspection CA: Compliance with Concern R: Returned to Compliance X or V: Non-Compliance
Y: Yes N: No UN: Unknown NA: Inspected, Not Applicable NE: Evaluation Determination will be Made at a Later Date NI: Not Inspected
***: Dept. approved alternate may apply No 'box' is an open ended question ND: Inspected, Not Determined**

SITE PHOTOS

Photo # 98887 Photo 1 of 6
Photo Date & Time 08/10/2023 00:00
Photo Direction E
Photographer MAUS, COLIN
Photo Description
Leachate loadout pad



Photo # 98888 Photo 2 of 6
Photo Date & Time 08/10/2023 00:00
Photo Direction S
Photographer MAUS, COLIN
Photo Description
Active landfill filling area



Photo # 98889 Photo 3 of 6
Photo Date & Time 08/10/2023 00:00
Photo Direction E
Photographer MAUS, COLIN
Photo Description
Active landfill tipping area



SITE PHOTOS

Photo # 98890 Photo 4 of 6
Photo Date & Time 08/10/2023 00:00
Photo Direction S
Photographer MAUS, COLIN
Photo Description
Active landfill tipping area



Photo # 98891 Photo 5 of 6
Photo Date & Time 08/10/2023 00:00
Photo Direction N
Photographer MAUS, COLIN
Photo Description
Landfill exterior slope



Photo # 98892 Photo 6 of 6
Photo Date & Time 08/10/2023 00:00
Photo Direction DOWN
Photographer MAUS, COLIN
Photo Description
MW-8 well nest locked and labeled



Appendix E

Tonnage Reports

			Waste Category (tons)[3]																			Waste Imported to Wisconsin from Out of State (tons)[2]						Capacity and Site Life		
Facility Name	DNR Lic. No.	County	Municipal Solid Waste Category 1	Utility Ash Category 2	Papermill Waste Sludge Category 3	Foundry Waste Category 4	POTW (Public Waste Water Treatment) Sludge - Category 5	Other solid waste - Non-MSW/ Non-HW - Category 6	Waste used for ADC/other - Category 19	Incinerator Ash - Category 20	Industrial waste used for ADC/other - Category 21	Shredder fluff used for ADC/other - Category 22	Treated contaminated soil used for ADC/other - Category 23	Unusable papermaking materials - Category 24	Construction & Demo. Waste - Category 25	Sediment Contaminated w/PCBs - Category 26	Waste from a Non-profit - Category 27	Waste from a Natural Disaster - Category 28	Waste removed at DNR request - Category 29	Qualified facility residue (Recyc.) - Category 30	Qualified facility residue (C&D, combustor) - Category 31	Exempt Waste Category 32	Sediments not mixed with other wastes not in other categories - Category 33	Totals: Categories 1-33	IA[2]	IL[2]	IN[2]	MI[2]	MN[2]	Total Tons Out of State Waste		Capacity As of January 2023 in Cu Yds[3]	Estimated Remaining Site Life In Years[4]
ADAMS COUNTY LANDFILL AND RECYCLING CENTER	3150	Adams	27,857	0	0	0	0	0	0	0	0	0	0	19,612	0	0	0	0	0	513	0	0	47,981	0	0	0	0	0	0	498,538	419,443	4
ADVANCED DISPOSAL SERVICES CRANBERRY CREEK LANDFILL LLC	2967	Wood	137,481	0	0	323	76	16,780	24,587	0	0	0	950	3,345	3,335	0	0	0	0	0	0	0	6,346	193,222	138	0	0	0	0	138	1,884,246	1,550,164	6
AHLSTROM-MUNKSJO - MOSINEE PLANT CELL 2 LANDFILL	4610	Marathon	0	13,787	12,565	0	0	1,110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27,462	0	0	0	0	0	0	869,604	854,054	16
AHLSTROM-MUNKSJO MOSINEE PLANT CELL 1 LANDFILL	2806	Marathon	0	0	0	0	0	892	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	892	0	0	0	0	0	0	4,130	0	0
BFI WASTE SYSTEMS OF NORTH AMERICA INC	3474	Washburn	175,512	8,831	0	0	0	10,324	0	14,631	0	0	1,858	0	5,994	0	0	0	0	2,810	1,107	0	0	221,067	0	0	0	0	61,269	61,269	5,155,760	4,930,010	19
BROWN CNTY SOUTH LF - STOCK - HOLLAND SITE	3565	Brown	226,660	0	0	0	3,552	4,773	38,434	0	8,429	23,238	0	50,697	36,506	0	0	0	0	0	0	0	0	392,289	0	0	0	0	0	0	9,303,000	7,266,533	11
CHEMTRADE SOLUTIONS LLC	1907	Winnebago	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35,953	35,953	0
CITY OF JANESVILLE LANDFILL	3939	Rock	147,131	0	0	0	369	1,475	0	0	3,021	35,143	0	0	22,197	0	0	0	0	9,438	0	0	0	218,774	0	35,143	0	0	0	35,143	4,557,435	4,261,335	14
COUNTY OF VERNON	3268	Vernon	16,266	0	0	0	0	0	136	0	0	0	0	0	925	0	0	0	0	0	0	0	0	17,327	0	0	0	0	0	0	62,472	33,769	2
DAIRYLAND POWER COOP (STONEMAN)	3122	Grant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60,000	60,000	0
DAIRYLAND POWER COOP LANDFILL PHASE IV - BELVIDERE	4126	Buffalo	0	50,719	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50,719	0	0	0	0	0	0	2,014,800	1,970,500	39
DANE CNTY LF #2 RODEFELD	3018	Dane	217,536	0	0	0	0	1,740	26,015	0	0	0	0	0	15,096	0	4,421	0	0	6,841	21,584	0	0	293,233	0	0	0	0	0	0	1,835,793	1,476,190	4
DEER TRACK PARK LANDFILL	3230	Jefferson	178,556	0	0	3,302	0	28,820	72,381	0	14	7,591	14,115	0	10,015	0	7	0	0	1,251	649	0	299	317,000	3,195	0	0	0	0	3,195	3,053,194	2,696,517	7
DOMTAR AW CORP ASH BARK SITE	1365	Wood	0	0	8,137	0	0	975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,112	0	0	0	0	0	0	423,598	414,985	39
DOMTAR AW CORP WASTEWATER TREATMENT SITE	2613	Wood	0	0	13,372	0	0	990	725	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15,087	0	0	0	0	0	0	557,016	542,721	44
EMERALD PARK LANDFILL, LLC	3290	Waukesha	189,140	0	0	5,023	0	25,714	39,612	0	10,589	35,946	1,627	0	85,100	0	2,842	0	0	9,450	0	0	47,005	452,048	0	0	0	0	0	0	3,859,968	6,279,780	9
FORT JAMES CORP GREEN BAY WEST LAND FILL	2332	Brown	0	0	120,629	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120,629	0	0	0	0	0	0	2,189,474	2,007,255	23
GEORGIA PACIFIC CONSUMER OPERATIONS LLC	2893	Brown	0	53,230	2,722	0	0	27,365	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83,317	0	0	0	0	0	0	221,900	144,528	1
GLACIER RIDGE LANDFILL, LLC	3068	Dodge	349,375	0	0	26,057	7,185	15,817	1,175	0	93,812	36,298	11	947	30,085	0	7,325	0	0	7,351	0	0	6,599	582,037	808	0	0	0	0	808	5,335,956	4,501,268	5
GREDE LLC - REEDSBURG	2974	Sauk	0	0	0	12,079	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12,079	0	0	0	0	0	0	90,579	81,287	9
HARRISON LANDFILL	3458	Calumet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40,845	40,845	3
HICKORY MEADOWS LANDFILL, LLC	3134	Calumet	175,477	0	99,123	1,000	130	25,771	0	0	4,125	41,813	9,964	78,457	29,930	0	0	0	0	0	0	0	8,148	473,938	0	0	0	130	0	130	5,323,763	3,698,500	6
HIGHWAY G SANITARY LANDFILL	3100	Vilas	33,933	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33,933	0	0	0	50	0	50	204,478	165,123	4
KESTREL HAWK LANDFILL	572	Racine	89,787	0	0	0	0	14,209	209	0	18,624	0	0	0	0	0	1,562	0	0	1,661	0	0	0	126,052	0	0	0	0	0	0	270,145	0	0
KOHLER CO LANDFILL	1508	Shaboygan	0	0	0	23,845	526	4,360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28,731	0	0	0	0	0	0	476,242	464,217	22
LA CROSSE COUNTY SOLID WASTE MANAGEMENT FACILITY	3253	La Crosse	38,106	68	0	0	0	1,752	8,211	9,737	7,779	0	2,942	0	24,062	0	677	0	0	16	18,720	0	0	112,069	129	53	0	0	18,911	19,093	1,584,065	1,446,794	11
LINCOLN COUNTY SANITARY LANDFILL	3141	Lincoln	32,954	0	0	223	648	339	711	0	0	0	720	0	0	0	0	0	0	0	0	0	0	35,595	0	0	0	0	0	0	956,219	909,716	14
LOKI FIONTAR LLC	3036	Outagamie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50,000	50,000	3
MAILLARD RIDGE LANDFILL, INC.	3244	Walworth	125,024	0	0	0	0	19,579	6,654	0	7,905	22,559	2	0	38,021	0	1,220	0	0	2,053	0	0	907	223,924	0	26,049	0	0	0	26,049	1,477,901	1,649,995	4
MARATHON CNTY BLUE BIRD RIDGE RDF	4228	Marathon	171,540	1,438	5,688	6,390	1,040	7,096	37	0	22,315	0	0	0	7,337	0	19	0	0	0	0	0	0	222,899	0	0	0	0	0	0	442,749	102,733	4
MARATHON COUNTY LANDFILL	3338	Marathon	19	0	0	0	0	491	0	0	0	0	0	0	54	0	0	0	0	0	0	0	0	563	0	0	0	0	0	0	176,174	175,239	1
MAR-OCO LAND FILL	3095	Marinette	11,749	0	0	0	0	0	4,044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15,794	0	0	0	0	0	0	363,953	337,630	12
MOCCASIN MIKE SANITARY LANDFILL	2627	Douglas	122,889	0	0	0	2,821	133	1,818	0	0	0	0	0	3,357	0	22	0	0	0	0	0	0	131,040	0	0	0	0	104,892	104,892	691,373	533,450	4
MONROE COUNTY RIDGEVILLE II SANITARY LANDFILL	3660	Monroe	44,492	0	0	0	0	11	1,329	0	0	0	27	0	0	0	0	0	0	0	0	0	0	45,859	0	0	0	0	0	0	51,000	154,554	3
NORTH SITE LANDFILL	3275	Winnebago	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,317,200	10,317,200	15
NORTHERN STATES POWER CO - WOODFIELD ASH LANDFILL	3233	Bayfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	131,378	131,378	10
OUTAGAMIE CNTY NE LF (AREA 6)	3235	Outagamie	262,912	0	0	0	991	2,082	36,378	0	27,849	19,577	3,630	13,284	59,105	0	13	0	0	9,409	5,310	0	0	440,541	0	0	0	0	0	0	1,262,767	869,978	2
PACKAGING CORP OF AMERICA - TOMAHAWK LANDFILL	3114	Lincoln	0	14,585	4,450	0	0	870	0	0	0	0	0	114	0	0	0	0	0	0	0	0	0	20,019	0	0	0	0	0	0	1,254,531	1,217,277	33
RED HILLS LANDFILL - PHASE 5-6	3251	Outagamie	0	0	84,151	0	0	569	0	0	7,993	0	0	0	0	0	0	0	0	0	0	0	0	92,713	0	0	0	0	0	0	4,552,598	4,425,889	35
SEVEN MILE CREEK LANDFILL, LLC	3097	Eau Claire	244,893	77	34	308	0	16,728	159	0	6,277	40,751	1,363	0	32,157	0	0	0	0	0	0	0	418	343,165	45	0	0	0	63,533	63,578	4,782,505	4,262,661	8
SHAWANO COUNTY PHASE 2 LANDFILL	3069	Shawano	281	0	0	4,315	0	119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,715	0	0	0	0	0	0	19,804	17,920	4
WATER QUALITY CENTER LANDFILL	2488	Wood	0	7,523	3,522	0	0	29	0	0	2,999	0	0	0	0	0	0	0	0	0	0	0	0	14,074	0	0	0	0	0	0	2,776,857	2,763,348	89
WATER RENEWAL CENTER LANDFILL	1686	Portage	0	0	6,931	0	0	4	5,995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12,930	0	0	0	0	0	0	367,167	326,370	37
WAUPACA FOUNDRY INC LANDFILL #3	3412	Waupaca	0	0	0	66,218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66,218	0	0	0	0	0	0	850,944	801,894	10
WEPCO PLEASANT PRAIRIE LF	2786	Kenosha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,977,494	3,977,494	20
WI PUBLIC SERV CORP -WESTON ASH DISP SITE # 3	3067	Marathon	0	73,648	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73,648	0	0	0	0	0	0	3,625,187	3,572,581	40
WISCONSIN ELECTRIC POWER COMPANY D/B/A WE ENERGIES - CALEDONIA LANDFILL	3232	Racine	0	7,726	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,726	0	0	0	0	0	0	2,395,573	2,389,135	40
WMWI - MADISON PRAIRIE	3318	Dane	0	0	0	2,471	0	23,967	18,444	0	0	0	0	0	34,867	0	0	0	0	0	3,971	0	18,597	102,317	0	0	0	0	0	0	784,606	703,690	7
WMWI - METRO RECYCLING & DISPOSAL	1099	Milwaukee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WMWI - METRO Recycling & Disposal - Northern Expansion-West	4579	Milwaukee	466,164	0	0	3,428	358	83,461	108,032	0	10,271	205	5,042	0	13,861	0	368	0	0	4,026	14,672	0	136	710,024	0	5	0	0	0	5	7,237,900	6,558,366	9
WMWI - ORCHARD RIDGE - EAST EXPANSION	4491	Waukesha	384,550	0	0	11,479	0	84,592	193,501	0	15,632	23,181	0	0	13,598	0	1,611	0	0	16,075	7,695	0	6,443	758,357	1	159	0	0	0	160	13,100,000	13,168,106	13
WMWI - ORCHARD RIDGE SECURE LANDFILL	3360	Waukesha	0	0	0	0	0	0	0	0	0	0	24,722	0	0	0	0	0	0	0	0	0	0	24,722	0	0	0	0	0	0	342,529	343,990	3
WMWI - PHEASANT RUN RECYCLING & DISPOSAL - NORTHEAST EXPANSION	3765	Kenosha	111,928	3,773	0	175	5,840	19,699	27,598	0	55	17,348	6,730	0	15,853	0	172	0	0	0	0	0	1,060	210,230	0	3,610	0	0	0	3,610	8,632,000	8,259,497	39
WMWI - VALLEY TRAIL RECYCLING & DISPOSAL	3066	Green Lake	115,103	0	0	10,817	0	23,061	5,990	0	37,909	0	2,932	0	2,161	0	449	0	0	0	0	0	386	198,807	0	0	0	0	0	0	3,707,915	3,536,620	18
WMWI - RIDGEVIEW RECYCLING & DISPOSAL - SOUTH	4292	Manitowoc	185,027	40,111	0	13,149	183	85,795	19,598	0	9,845	0	6,334	11,190	4,647	0	4,990	0	0	1,364	0	0	1,218	383,450	0	0	0	11,280	0	11,280	6,449,594	6,026,915	17
WMWI - TIMBERLINE TRAIL RECYCLING & DISPOSAL	3455	Rusk	116,531	22	0	0	0	4,705	0	0	3,291	0	1,413	1,877	1,198	0	580	0	0	0	0	0	483	130,100	0	0	0	0	46	46	3,876,261	3,646,021	9
WPL - COLUMBIA ENERGY CENTER LANDFILL	3025	Columbia	0	343,845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	343,845	0	0	0	0	0	0	1,077,099	612,655	9
WPL - EDGEWATER GENERATING STATION	2853	Shaboygan	0	7,705	0	0	0	0	0	0	0	0	0	0	342	0	0	0	0	0	0	0	0	8,046	0	0	0	0	0	0	783,153	27,820	20
WPL - COLUMBIA ENERGY CENTER	2325	Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total			**4,398,873**	**627,087**	**361,324**	**190,602**	**23,719**	**556,197**	**641,773**	**24,368**	**298,733**	**303,650**	**84,382**	**159,911**	**509,414**	**0**	**26,279**	**0**	**0**	**71,745**	**74,221**	**0**	**98,044**	**8,450,322**	**4,316**	**65,019**	**0**	**11,459**	**248,651**	**329,445**			

Footnotes:

[1]Waste categories are defined in the Environmental Fees table on the DNR website https://dnr.wi.gov/topic/Landfills/documents/environmentalfeesummary.pdf.

[2] Out of State tonnage is already included in the category and total tonnages.

[3] As reported by the landfill on the Calendar Year 2021 or 2022 Waste Disposal Tonnage/Capacity Certification Report.

[4] As calculated and reported by the landfill. Methods vary.

Last updated May 2023

2021 Wisconsin Municipal and Industrial Waste Landfill Tonnages

Facility Name	WDNR Lic. No.	County	Waste Category (tons)[1]																	Waste Imported to Wisconsin from Out of State (tons)[2]						Capacity and Site Life	
			Municipal Solid Waste Category 1	Utility Ash Category 2	Papermill Waste Sludge Category 3	Foundry Waste Category 4	POTW (Public Waste Water Treatment) Sludge - Category 5	Other solid waste - Non-MSW/ Non-HW - Category 6	Waste used for ADC/other - Category 19	Incinerator Ash Category 20	Industrial waste used for ADC/other - Category 21	Shredder fluff used for ADC/other - Category 22	Treated contaminated soil used for ADC/other - Category 23	Unusable paper making materials - Category 24	Construct-ion & Demo. Waste - Category 25	Sediment Contaminated w/PCBs - Category 26	Waste from a Non-profit - Category 27	Waste from a Natural Disaster - Category 28	Waste removed at DNR request - Category 29	Qualified facility residue (Recyc.) - Category 30	Qualified facility residue (C&D, combustor) - Category 31	Exempt Waste Category 32	Totals: Categories 1-32	IA[2]	IL[2]	IN[2]	MI[2]	MN[2]	Total Tons Out of State Waste		Capacity As of January 2022 in Cu Yds[3]	Estimated Remaining Site Life In Years[4]
ADAMS COUNTY LANDFILL AND RECYCLING CENTER	3150	Adams	41.368	0	0	0	0	0	0	0	0	0	0	351	2.396	0	0	0	0	0	0	0	44.115	0	0	0	0	0	0	548.452	498.538	8
ADVANCED DISPOSAL SERVICES CRANBERRY CREEK LANDFILL LLC	2967	Wood	130,931	0	0	525	0	17,075	0	0	31,908	5,758	1,037	0	9,808	0	0	0	0	1,817	0	0	198,859	0	0	0	0	0	0	2,057,749	1,884,246	7
AHLSTROM-MUNKSJO - MOSINEE PLANT CELL 2 LANDFILL	4610	Marathon	0	10,151	1	0	0	15,597	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25,749	0	0	0	0	0	0	956,245	869,604	17
AHLSTROM-MUNKSJO MOSINEE PLANT CELL 1 LANDFILL	2806	Marathon	0	2,336	3,094	0	0	2,646	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,076	0	0	0	0	0	0	9,094	4,130	1
BFI WASTE SYSREMS OF NORTH AMERICA INC	3474	Washburn	193,345	9,651	0	0	755	15,239	0	14,820	0	0	437	0	3,055	0	0	0	0	3,142	0	0	240,444	0	0	0	0	62,652	62,652	5,492,259	5,155,760	19
BROWN CNTY SOUTH LF - STOCK - HOLLAND SITE	3565	Brown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.303.000	9.303.000	11
CHEMTRADE SOLUTIONS LLC	1907	Winnebago	0	0	0	0	0	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	0	0	0	0	0	0	36,012	35,953	14
CITY OF JANESVILLE LANDFILL	3939	Rock	148,410	0	0	0	2,021	2,329	0	0	2,674	41,344	0	0	20,589	0	0	0	1,309	15,840	0	0	234,516	0	41,344	0	0	0	41,344	4,941,340	4,557,435	14
COUNTY OF VERNON	3268	Vernon	17,706	0	0	0	0	0	0	0	0	0	0	0	691	0	0	0	0	0	0	0	18,397	0	0	0	0	0	0	93,088	62,472	3
DAIRYLAND POWER COOP (STONEMAN)	3122	Grant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60,000	60,000	0
DANE CNTY LF #2 RIDGEFIELD	3018	Dane	189,067	0	0	0	0	1,674	30,098	0	0	0	0	0	15,352	0	3,759	0	0	5,786	24,737	0	270,473	0	0	0	0	0	0	2,165,941	1,835,793	6
DEER TRACK PARK LANDFILL	3230	Jefferson	196,442	0	0	3,410	80	18,641	13,579	0	0	9,726	16,244	798	8,021	0	299	0	0	1,504	568	0	269,312	4,921	0	0	0	0	4,921	3,319,839	3,053,194	10
DOMTAR AW CORP ASH BARK SITE	1365	Wood	0	0	0	0	0	865	1,980	0	0	0	0	0	0	0	0	0	0	0	0	0	2,845	0	0	0	0	0	0	426,477	423,598	39
DOMTAR AW CORP WASTEWATER TREATMENT SITE	2613	Wood	0	0	14,335	0	0	2,189	566	0	0	0	0	0	0	0	0	0	0	0	0	0	17,090	0	0	0	0	0	0	575,150	557,017	44
DAIRYLAND POWER COOP LANDFILL PHASE IV - BELVIDERE	4126	Buffalo	0	47,882	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47,882	0	0	0	0	0	0	1,853,033	2,014,800	44
EMERALD PARK LANDFILL, LLC	3290	Waukesha	152.728	0	5.203	1.837	804	26.600	55.491	0	12.646	42.188	773	0	71.951	0	426	0	0	2.992	0	0	373.639	0	0	0	0	0	0	4.430.310	3.859.968	6
FORT JAMES CORP GREEN BAY WEST LAND FILL	2332	Brown	0	0	88,298	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88,298	0	0	0	0	0	0	2,267,820	2,152,774	24
GEORGIA PACIFIC CONSUMER OPERATIONS LLC	2893	Brown	0	33,342	6,373	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39,715	0	0	0	0	0	0	120,659	221,900	30
GREDE LLC - REEDSBURG	2974	Sauk	0	0	0	9,176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,176	0	0	0	0	0	0	99,500	90,324	11
GLACIER RIDGE LANDFILL, LLC	3068	Dodge	324,893	0	0	9,073	6,138	24,928	6,895	0	88,762	45,106	13	28	25,039	0	1,694	0	0	4,608	0	0	537,177	827	0	0	0	0	827	6,123,385	5,335,956	6
HIGHWAY G SANITARY LANDFILL	3100	Vilas	46.690	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46.690	0	0	0	621	0	621	230.000	200.000	6
HARRISON LANDFILL	3458	Calumet	0	0	9,224	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,224	0	0	0	0	0	0	55,486	40,845	5
HICKORY MEADOWS LANDFILL, LLC	3134	Calumet	143,814	0	73,776	7,472	178	27,934	0	0	7,316	41,046	4,767	59,500	27,681	18	0	0	0	0	0	32,590	426,092	0	0	0	178	0	178	5,609,183	5,323,763	8
KESTREL HAWK LANDFILL	572	Racine	116,749	0	0	0	0	28,723	235	0	4,271	0	0	0	0	0	1,778	0	0	323	1,068	0	153,147	0	1,014	0	0	0	1,014	451,000	270,145	1
KOHLER CO LANDFILL	1508	Sheboygan	0	0	0	23,675	604	1,645	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25,924	0	0	0	0	0	0	118,056	476,242	35
LA CROSSE COUNTY SOLID WASTE MANAGEMENT FACILITY	3253	La Crosse	45.014	79	0	0	2.453	2.382	14.474	9.790	5.693	0	51	0	25.285	0	715	0	0	8	10.599	0	116.543	148	0	0	0	18.894	19.042	1.701.269	1.584.065	11
LINCOLN COUNTY SANITARY LANDFILL	3141	Lincoln	28,642	0	45	0	0	389	904	0	0	0	3,895	0	0	0	0	0	0	0	0	0	33,875	0	0	0	0	0	0	988,257	956,219	15
LOKI FIONTAR LLC	3036	Outagamie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50,000	50,000	3
MAR-OCO LAND FILL	3095	Marinette	13,370	0	0	0	0	0	4,552	0	0	0	0	0	0	0	0	0	0	0	0	0	17,922	0	0	0	0	0	0	409,313	379,746	12
MARATHON CNTY BLUE BIRD RIDGE RDF	4228	Marathon	183,617	1,601	5,622	0	2,160	12,601	20,726	0	13,365	0	0	0	11,420	0	18	0	0	0	0	0	251,129	0	0	0	0	0	0	828,081	442,749	1
MARATHON COUNTY LANDFILL	3338	Marathon	134	0	0	0	2,193	68	1,371	0	0	0	0	0	2,288	0	0	0	0	0	0	0	6,053	0	0	0	0	0	0	184,021	176,174	2
MOCCASIN MIKE SANITARY LANDFILL	2627	Douglas	122,429	0	0	0	2,938	932	1,474	0	0	0	0	0	5,420	0	18	0	0	0	0	0	133,211	0	0	0	0	107,832	107,832	795,733	691,373	4
MONROE COUNTY RIDGEVILLE II SANITARY LANDFILL	3660	Monroe	48,192	0	0	0	9	165	5,519	0	0	0	372	0	60	0	0	0	0	0	0	0	54,317	0	0	0	0	0	0	47,821	51,000	1
MALLARD RIDGE LANDFILL, INC	3244	Walworth	112,901	0	0	0	0	21,926	11,539	0	10,195	25,289	3,085	0	33,442	0	317	0	0	2,516	0	0	221,210	0	27,653	0	0	0	27,653	1,332,937	1,477,901	5
NORTH SITE LAND FILL LICENSE #3275	3275	Winnebago	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,317,200	10,317,200	15
NORTHERN STATES POWER CO - WOODFIELD ASH LANDFILL	3233	Bayfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	131.378	131.378	10
OUTAGAMIE CNTY NE LF (AREA 6)	3235	Outagamie	513,952	0	355	0	2,928	2,926	52,945	0	49,740	47,855	7,025	38,856	45,959	0	22	0	0	8,791	1,653	0	773,008	0	0	0	0	0	0	1,950,503	1,262,767	3
PACKAGING CORP OF AMERICA - TOMAHAWK LANDFILL	3114	Lincoln	0	16,883	4,588	0	0	352	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21,823	0	0	0	0	0	0	1,297,014	1,254,531	30
RED HILLS LANDFILL - PHASE 5-6	3251	Outagamie	0	0	65,569	0	0	239	0	0	13,271	0	0	0	0	0	0	0	0	0	0	0	79,079	0	0	0	0	0	0	4,632,000	4,552,598	40
SHAWANO COUNTY PHASE 2 LANDFILL	3069	Shawano	486	0	0	12,870	0	2	0	0	0	0	0	0	41	0	0	0	0	0	0	0	13,399	0	0	0	0	0	0	29,971	19,804	2
STORA ENSO NORTH AMERICA - WATER RENEWAL CTR	1686	Portaee	0	0	9,659	0	0	33	15.105	0	1.212	0	0	0	0	0	0	0	0	0	0	0	26.009	0	0	0	0	0	0	404.395	367.167	16
SEVEN MILE CREEK LANDFILL, LLC	3097	Eau Claire	204,311	53	4,367	309	0	15,096	153	0	5,735	54,281	2,566	0	37,420	0	0	0	0	0	0	0	324,291	156	0	0	0	44,359	44,515	1,160,000	4,819,313	10
W M W I - MADISON PRAIRIE	3318	Dane	0	0	0	3,854	0	31,476	16,933	0	0	27	0	0	34,944	0	0	0	0	0	815	47,189	135,238	27	0	0	0	14	41	837,136	784,606	10
WAUPACA FOUNDRY INC LANDFILL #3	3412	Waupaca	0	0	0	56,852	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56,852	0	0	0	0	0	0	893,057	850,944	10
WEPCO PLEASANT PRAIRIE LF	2786	Kenosha	0	9,780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,780	0	0	0	0	0	0	3,985,644	3,977,494	0
WI PUBLIC SREV CORP-WESTON ASH DISP SITE # 3	3067	Marathon	0	70,415	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70,415	0	0	0	0	0	0	3,683,866	3,625,187	14
WISCONSIN ELECTRIC POWER COMPANY D/B/A WE ENERGIES - CALEDONIA LANDFILL	3232	Racine	0	8,718	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,718	0	0	0	0	0	0	2,402,838	2,395,573	15
WMWI - METRO RECYCLING & DISPOSAL	1099	Milwaukee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WMWI - METRO RECYCLING & DISPOSAL - NORTHERN EXPANSION-WEST	4579	Milwaukee	531,313	2,227	0	4,268	1,268	89,542	48,773	0	7,920	39	12,346	0	7,636	0	1,398	0	0	5,985	13,195	0	725,910	0	208	0	0	0	208	8,116,000	7,237,900	8
WMWI - Orchard Ridge Recycling and Disposal	3360	Waukesha	0	0	0	0	0	0	35,872	0	0	0	27,079	0	0	0	0	0	0	0	0	0	62,951	0	0	0	0	0	0	189,985	342,529	1
WMWI - ORCHARD RIDGE - EAST EXPANSION	4491	Waukesha	434.890	0	0	17.587	0	107.179	177.798	0	14.106	2.008	0	0	19.407	0	5.274	0	0	0	17.145	7.185	802.579	130	1.114	0	385	0	1.628	4.469.000	3.600.000	4
WMWI - PHEASANT RUN RECYCYLING & DISPOSAL - NORTHEAST EXPANSION	3765	Kenosha	97,535	0	0	0	7,349	21,615	39,953	0	606	21,021	6,085	30	13,374	0	77	0	0	0	0	0	207,645	0	2,554	0	0	0	2,554	8,840,000	8,632,000	43
WMWI - VALLEY TRAIL RECYCLING & DISPOSAL	3066	Green Lake	129,699	0	1,065	12,118	0	22,938	11,404	0	51,767	0	3,977	2,745	2,827	0	1,164	0	0	0	0	0	239,704	0	0	0	0	0	0	3,883,725	3,707,915	18
WMWI -RIDGEVIEW RECYCLING & DISPOSAL - SOUTH	4292	Manitowoc	213,640	37,243	2,737	4,844	254	60,060	37,859	0	14,543	0	0	26,033	4,041	0	5,424	0	0	2,077	0	0	408,755	0	0	0	53	0	53	6,852,716	6,449,594	17
WMWI-TIMBERLINE TRAIL RECYCLING & DISPOSAL	3455	Rusk	95,862	2,578	0	0	0	4,424	28	0	515	0	719	1,834	751	0	238	0	0	0	0	0	106,949	0	0	0	0	103	103	4,000,291	3,876,261	15
WPL - EDGEWATER GENERATING STATION	2853	Sheboygan	0	22,857	0	0	0	0	0	0	0	0	0	0	2.004	0	0	0	0	0	0	0	24,861	0	0	0	0	0	0	805.407	783.153	52
WPL – COLUMBIA ENERGY CENTER LANDFILL	3025	Columbia	0	147,481	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	147,481	0	0	0	0	0	0	3,200,000		20
WPL-COLUMBIA ENERGY CENTER	2325	Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
WATER QUALITY CENTER LANDFILL	2488	Wood	0	6,507	5,903	0	0	27	0	0	2,470	0	0	0	0	0	0	0	0	0	0	0	14,906	0	0	0	0	0	0	2,791,603	2,776,857	85
		Totals	**4,478,130**	**429,783**	**300,214**	**167,870**	**32,133**	**580,522**	**606,226**	**24,610**	**338,714**	**335,687**	**90,471**	**130,176**	**430,901**	**18**	**22,620**	**0**	**1,309**	**72,534**	**59,819**	**79,779**	**8,181,518**	**6,208**	**73,886**	**0**	**1,237**	**233,854**	**315,185**			

Footnotes:

[1] Waste categories are defined in the Environmental Fees table on the DNR website at: https://dnr.wi.gov/topic/Landfills/documents/environmentalfeesummary.pdf

[2] Out of State tonnage is already included in the category and total tonnages.

[3] As reported by the landfill on the Calendar Year 2020 or 2021 Waste Disposal Tonnage/Capacity Certification Report.

[4] As calculated and reported by the landfill. Methods vary.

2020 Wisconsin Municipal and Industrial Waste Landfill Tonnage Report

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				Waste Category (tons)[1]																		Waste Imported to Wisconsin from Out of State (tons)[3]						Capacity and Site Life			
Facility Name	WDNR Lic. No.	County	Initial or Original Capacity	Municipal waste - Cat. 1	Utility ash - Cat. 2	Papermill sludge / ash - Cat. 3	Foundry waste - Cat. 4	POTW sludge - Cat. 5	Other solid waste - Non-MSW/ Non-HW - Cat. 6	Waste used for ADC/other - Cat. 19	Incin-erator ash - Cat. 20	Industrial waste used for ADC/other - Cat. 21	Shredder fluff used for ADC/other - Cat. 22	Treated contam-inated soil used for ADC/other - Cat. 23	Unusable paper-making materials Cat. 24	Construct-ion & Demo. Waste - Cat. 25	Sediment Contam-inated w/PCBs - Cat. 26	Waste from a Non-profit - Cat. 27	Waste from a Natural Disaster - Cat. 28	Waste removed at DNR request - Cat. 29	QMRF residue (Recyc.) - Cat. 30	QMRF residue (C&D) - Cat. 31	Total (Cat 1-31)	IL[4]	IN[4]	IA[4]	MN[4]	MI[4]	Other[4]	Cap. As of Jan. 2020 in Cu Yds[6]	Cap. as of Jan. 2021 in Cu Yds [5 or 6]	Estimated Disposal Capacity consumed in 2020 (Cu Yds)	Estimated Remaining Site Life in Years[7]
KESTREL HAWK LF	572	Racine	5,000,000	105,341	0	0	0	0	57,229	93	0	7,739	0	0	0	0	0	1,926	0	0	0	1,127	173,455	85	0	0	0	0	0	96,293	451,000	281,290[7]	2
WMWI - METRO RECYCLING & DISPOSAL	1099	Milwaukee	5,175,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOMTAR AW LLC ASH BARK SITE	1365	Wood	1,260,000	0	0	0	0	0	826	0	0	0	0	0	0	0	0	0	0	0	0	0	826	0	0	0	0	0	0	427,506	426,477	1,028[7]	0
KOHLER CO LF	1508	Sheboygan	4,240,000	0	0	0	16,953	628	991	0	0	0	0	0	0	0	0	0	0	0	0	0	18,572	0	0	0	0	0	0	13,908	118,056	13,757[7]	9
WATER RENEWAL CENTER LANDFILL	1686	Portage	1,551,000	0	0	6,910	0	0	0	805	0	870	0	0	0	0	0	0	0	0	0	0	8,585	0	0	0	0	0	0	414,206	404,395	9,811[7]	33
CHEMTRADE SOLUTIONS LLC	1907	Winnebago	175,000	0	0	0	0	0	95	0	0	0	0	0	0	0	0	0	0	0	0	0	95	0	0	0	0	0	0	36,107	36,012	86[9]	15
WPL-COLUMBIA ENERGY CENTER	2325	Columbia	500,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G-P CONSUMER OPERATIONS LLC GB WEST LF	2332	Brown	6,250,000	0	0	37,720	0	0	0	5,599	0	13,388	0	0	0	0	0	0	0	0	0	0	56,707	0	0	0	0	0	0	2,200,179	2,165,991	73,900[7]	26
WATER QUALITY CENTER LF	2488	Wood	679,384	0	7,691	29,103	0	0	4,686	0	0	23,455	0	0	0	30	0	0	0	0	0	0	64,966	0	0	0	0	0	0	2,856,989	2,791,603	65,386[9]	NR[2]
DOMTAR AW LLC WASTEWATER TREATMENT LF	2613	Wood	2,736,369	0	0	2,904	0	0	10,505	600	0	0	0	0	0	0	0	0	0	0	0	0	14,009	0	0	0	0	0	0	594,025	575,150	18,875[5]	1
SUPERIOR CTY MOCCASIN MIKE LF	2627	Douglas	1,500,000	116,919	0	0	0	2,547	2,347	1,683	0	0	0	0	0	7,693	0	26	0	0	0	0	131,215	0	0	0	104,336	0	0	772,995	623,151	149,844[7]	5
WEPCO PLEASANT PRAIRIE LF	2786	Kenosha	5,000,000	0	12,281	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12,281	0	0	0	0	0	0	3,995,878	3,985,644	10,234[7]	2
AHLSTROM-MUNKSJÖ MOSINEE LLC	2806	Marathon	500,000	0	1,767	2,613	0	0	6,065	0	0	0	0	0	0	0	0	0	0	0	0	0	10,445	0	0	0	0	0	0	8,500	9,094	11,334[7]	1
WPL - EDGEWATER GENERATING STATION	2853	Sheboygan	1,150,000	0	12,005	0	0	0	0	0	0	0	0	0	0	3,445	0	0	0	0	0	0	15,450	0	0	0	0	0	0	820,923	805,407	15,516[7]	54
GEORGIA PACIFIC CONSUMER OPERATIONS LLC	2893	Brown	750,000	0	0	5,384	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,384	0	0	0	0	0	0	127,459	120,659	6,800[7]	17
ADVANCED DISP SERV CRANBERRY CREEK LF LLC	2967	Wood	1,200,000	142,981	24	0	576	704	20,424	0	0	22,234	9,411	9,199	2,164	11,678	0	0	0	1,976	0	0	221,372	0	0	66	0	0	0	2,307,622	2,057,749	249,873[9]	NR[2]
GREDE LLC - REEDSBURG	2974	Sauk	375,000	0	0	0	8,560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,560	0	0	0	0	0	0	106,085	99,500	6,585	7
DANE CNTY LF #2 RODEFELD	3018	Dane	650,000	182,532	0	0	0	2,595	1,206	23,507	0	0	0	0	0	8,922	0	0	0	0	5,897	13,997	238,656	0	0	0	0	0	0	2,457,921	2,165,941	291,980[7]	8
WPL- COLUMBIA ENERGY CENTER	3025	Columbia	6,529,200	0	86,168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86,168	0	0	0	0	0	0	5,256,344	5,184,538	71,806[9]	29
LOKI FIONTAR LLC	3036	Outagamie	4,250,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50,000	50,000	0	NR[2]
WMWI - VALLEY TRAIL RECYCLING & DISPOSAL	3066	Green Lake	2,813,000	96,608	0	4,881	12,097	0	49,878	7,708	0	43,602	0	9,384	633	2,176	0	498	0	0	0	0	227,465	0	0	0	0	0	0	3,999,271	3,883,725	115,546[9]	17
WIS PUBLIC SERV CORP WESTON ASH DISP SITE #3	3067	Marathon	873,000	0	50,150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50,150	0	0	0	0	0	0	3,725,658	3,683,866	41,792[7]	15
GLACIER RIDGE LANDFILL LLC	3068	Dodge	1,885,800	420,059	0	0	21,503	5,120	25,493	1,705	0	95,936	33,466	3,984	0	31,616	0	8,997	0	0	1,691	0	649,570	0	0	625	0	0	0	4,388,437	6,123,385[7]	965,052[9]	NR[2]
SHAWANO CTY PHASE 2 LF	3069	Shawano	405,000	412	0	0	12,112	0	217	0	0	0	0	0	0	74	0	0	0	0	0	0	12,815	0	0	0	0	0	0	39,717	29,971	9,746[7]	3
MAR-OCO LF	3095	Marinette	1,480,000	15,666	0	0	0	0	0	4,179	0	0	0	0	0	0	0	0	0	0	0	0	19,845	0	0	0	0	0	0	442,109	409,313	32,796[9]	12
SEVEN MILE CREEK LANDFILL LLC	3097	Eau Claire	3,000,000	226,925	320	777	443	0	17,359	1,346	0	11,856	53,241	914	0	31,749	0	0	0	0	0	0	344,930	0	0	391	71,649	0	0	1,470,000	1,160,000	550,927[9]	2
HWY G SANITARY LF	3100	Vilas	250,000	21,260	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,507	0	24,767	0	0	0	0	645	0	244,613	230,000	14,613[7]	7
PACKAGING CORP OF AMERICA - TOMAHAWK LF	3114	Lincoln	2,800,000	0	19,345	6,644	0	391	510	0	0	0	0	0	0	0	0	0	0	0	0	0	26,890	0	0	0	0	0	0	1,334,622	1,297,014	37,608[7]	35
DAIRYLAND POWER COOP - CASSVILLE	3122	Grant	83,400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60,000	60,000	0	0
HICKORY MEADOWS LANDFILL LLC	3134	Calumet	7,546,000	188,565	0	37,920	7,261	384	74,124	0	0	14,632	25,695	5,906	62,212	32,387	8,566	593	0	0	0	0	458,245	0	0	0	0	248	0	6,925,106	5,609,183	1,315,923[5]	NR[2]
LINCOLN CNTY SANITARY LF	3141	Lincoln	825,000	40,238	0	80	0	0	372	752	0	0	0	4,601	0	0	0	0	0	0	0	0	46,043	0	0	0	0	0	0	1,037,912	988,257	49,655[7]	16
ADAMS CNTY LF & RECYCLING CENTER	3150	Adams	700,000	40,164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	502	0	40,666	0	0	0	0	0	0	591,258	548,452	42,806[7]	10
DEER TRACK PARK LANDFILL	3230	Jefferson	3,885,800	143,577	0	0	324	0	25,712	31,086	0	3,264	8,544	8,621	1,860	4,172	0	0	0	0	1,385	550	229,095	0	0	3,409	0	0	0	3,540,483	3,319,839	220,644[9]	13
WEPCO CALEDONIA LF	3232	Racine	0	7,460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,460	0	0	0	0	0	0	2,409,055	2,402,838	6,217[9]	15
NORTHERN STATES POWER CO - WOODFIELD ASH LF	3233	Bayfield	255,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	131,378	131,378	0	0
OUTAGAMIE CNTY NE LF (AREA 6)	3235	Outagamie	7,955,000	482,791	0	100	0	5,069	2,924	34,141	4,136	36,992	36,728	9,255	14,470	49,231	0	13	0	0	8,978	0	684,828	0	0	0	0	0	0	2,645,836	1,950,503	695,333[9]	3
MALLARD RIDGE LANDFILL INC	3244	Walworth	5,197,000	115,081	0	0	0	0	35,144	16,720	0	8,728	20,262	13	0	36,469	0	2,210	0	0	2,634	0	237,260	21,254	0	0	0	0	0	1,659,734	1,332,937	326,797[7]	3
RED HILLS LANDFILL - PHASES 5 & 6	3251	Outagamie	2,750,000	0	0	65,943	0	0	228	0	0	27,910	0	0	0	0	0	0	0	0	0	0	94,081	0	0	0	0	0	0	4,872,233	4,632,000	240,233[9]	18
LA CROSSE CNTY LF MSW & ASH MONOFILL	3253	La Crosse	1,672,200	60,880	283	0	0	502	2,148	6,909	9,520	5,676	0	234	0	29,565	0	380	0	0	2	0	116,099	0	0	246	19,512	0	0	1,836,427	1,701,269	161,477[7]	12
VERNON CNTY SOLID WASTE/RECYCLING FACILITY	3268	Vernon	283,448	19,817	0	0	0	0	0	0	0	0	0	0	0	1,119	0	0	0	0	0	0	20,937	0	0	0	0	0	0	97,681	69,950	27,731[7]	3
GEORGIA PACIFIC NORTH LF	3275	Winnebago	3,062,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,317,200	10,317,200	0	15
EMERALD PARK LANDFILL LLC	3290	Waukesha	3,550,360	227,052	0	14,857	2,319	1,367	28,735	102,531	0	14,809	14,472	2,921	0	77,088	0	3,311	0	0	112	0	489,574	0	0	0	0	0	0	5,150,669	4,430,310	720,359[9]	6
W M W I - MADISON PRAIRIE LF	3318	Dane	4,284,000	0	216	0	794	0	28,292	16,990	0	0	115	0	0	25,946	0	0	0	0	0	22,314	94,667	0	0	0	0	0	0	913,440	837,136	76,304[9]	9
MARATHON CNTY AREA B LF	3338	Marathon	2,508,000	0	0	0	0	0	0	938	0	0	0	0	0	1,059	0	0	0	0	0	0	1,997	0	0	0	0	0	0	186,568	184,021	2,547[9]	2
WMWI-ORCHARD RIDGE RECYCLING & DISPOSAL	3360	Waukesha	9,352,900	0	0	0	0	0	0	0	0	0	0	42,486	0	0	0	0	0	0	0	0	42,486	0	0	3	0	0	0	50,000	81,500	NR[10]	1
WAUPACA FOUNDRY INC LF #3	3412	Waupaca	1,339,000	0	0	0	48,893	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48,893	0	0	0	0	0	0	929,274	893,057	36,217[9]	10
WMWI- TIMBERLINE TRAIL RECYCLING & DISPOSAL	3455	Rusk	2,933,000	83,198	2,974	0	0	0	4,760	905	0	978	0	262	1,577	887	0	673	0	0	0	0	96,213	0	0	0	25	0	0	4,242,318	4,000,291	242,027[9]	15
HARRISON LANDFILL	3458	Calumet	525,000	0	0	39,305	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39,305	0	0	0	0	0	0	117,875	55,486	62,389[7]	1
BFI WASTE SYSTEMS OF NORTH AMERICA LLC	3474	Washburn	4,347,900	176,822	1,886	0	0	0	15,683	0	17,320	0	0	126	0	2,294	0	0	0	0	0	0	214,131	0	0	0	72,163	0	0	5,707,624	5,492,259	215,365[9]	32
MONROE CNTY RIDGEVILLE II SAN LF	3660	Monroe	997,500	44,103	0	0	0	0	422	3,445	0	0	0	0	0	0	0	0	0	0	0	0	47,970	0	0	0	0	0	0	85,901	NR[2]	NR[2]	NR[2]
WMWI - PHEASANT RUN RECYCLING & DISPOSAL	3765	Kenosha	487,000	97,426	0	0	76	9,113	15,387	33,615	0	461	19,180	2,628	59	16,930	0	148	0	0	0	0	195,023	5,568	0	0	0	0	0	9,040,800	8,840,000	200,800[9]	NR[2]
JANESVILLE CTY LF (NEW)	3939	Rock	4,765,000	144,025	0	0	0	1,487	1,987	0	0	2,229	36,920	0	0	22,994	0	0	0	1,304	13,852	0	224,798	36,920	0	0	0	0	0	5,195,237	4,941,340	253,897[7]	20
DAIRYLAND POWER COOP PHASE IV - BELVIDERE	4126	Buffalo	3,011,000	0	36,650	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36,650	0	0	0	0	0	0	1,897,013	1,853,033	43,980	NR[2]
MARATHON CNTY BLUE BIRD RIDGE RDF	4228	Marathon		190,537	1,551	6,670	0	577	9,279	17,733	0	23,948	0	0	0	15,608	0	15	0	0	0	0	265,918	0	0	0	0	0	0	1,232,038	828,081	403,957[9]	2
WMWI -RIDGEVIEW RECYCLING & DISPOSAL - SOUTH	4292	Manitowoc	10,300,000	155,237	23,173	0	3,485	290	72,148	113,103	0	22,480	0	0	24,169	1,158	18	4,851	0	0	3,036	0	423,148	0	0	0	0	437	0	7,214,819	6,852,716	362,103[9]	12
WMWI-ORCHARD RIDGE RECYCLING & DISPOSAL	4491	Waukesha	5,422,855	384,692	0	0	507	0	130,478	171,529	0	20,229	0	0	0	10,824	0	1,111	0	0	18,208	6,892	744,469	1,913	0	305	74	175	53	5,300,000	4,469,000	831,000[9]	5
WMWI - METRO RECYCLING & DISPOSAL	4579	Milwaukee	9,653,185	471,443	0	0	5,932	610	89,054	67,384	0	8,078	0	5,884	0	8,387	0	120	0	0	7,647	14,488	679,028	228	0	0	0	0	0	8,970,800	8,116,000	854,000[9]	9
AHLSTROM-MUNKSJÖ MOSINEE LLC, CELL # 2	4610	Marathon	968,592	0	8,081	116	0	0	1,742	0	0	0	0	0	0	0	0	0	0	0	0	0	9,939	0	0	0	0	0	0	968,592	956,245	12,347[7]	19
		Totals		4,394,352	272,025	261,925	141,835	31,383	736,450	665,006	30,976	409,495	258,033	106,418	107,145	433,501	8,584	24,871	0	1,304	69,427	59,368	8,012,100	65,969	0	5,044	267,760	1,505	53				

Footnotes:

[1] Waste categories are defined in the Environmental Fees table on the DNR website at https://dnr.wi.gov/topic/Landfills/documents/environmentalfeesummary.pdf

[2] NR = not reported at the time of posting.

[3] Out of State tonnage is already inlcuded in the category and total tonnages.

[4] As reported by the landfill on the Calendar Year 2019 or 2020 Waste Disposal Tonnage/Capacity Certification Report.

[5] As reported by the landfill. Calculated based on a topographical survey.

[6] As reported by the landfill. Calculated using standard conversion factors.

[7] As calculated and reported by the landfill. Methods vary.

[8] Calculated using the Jan. 2020 and Jan 2021 capacity reported by the landfill.

[9] Landfill capacity increased due to an approved expansion.

[10] NR = not reported, landfill reported a survey was used to estimate Jan. 2021 Capacity remaining

KEY	
Category 1: Municipal Waste	**Category 23:** Treated Contaminated Soil used for daily cover
Category 2: Utility Ash/Sludges	**Category 24:** Exempt Unusable Paper Making Materials
Category 3: Pulp/Papermill Mfg waste	**Category 26:** Construction & Demolition (C&D) Waste
Category 4: Foundry Waste	**Category 26:** Sediments Contaminated with PCBs
Category 5: POTW Sludges	**Category 27:** Waste Generated by a Non-Profit Org
Category 6: All other SW (not HW)	**Category 28:** Waste Generated by Natural Disaster
Category 19: Fee Exempt waste used for dikes, berms, etc	**Category 29:** Waste Removed at Request of DNR to Mitigate Potential Env Impacts
Category 20: Energy Recovery Incinerator Ash	**Category 30:** MRF Residuals – 10% cap
Category 21: High Volume Industrial used for daily cover.et	**Category 31:** MFR Residuals – 30% cap
Category 22: Shredder Fluff used for daily cover	

Last revised November 2021

2019 Wisconsin Municipal and Industrial Waste Landfill Tonnage Report

Facility Name	WDNR Lic. No.	County	Initial or Original Capacity	Cap. as of Jan. 2021 In Cu Yds	Cat. 1 (tons)	Cat. 2 (tons)	Cat. 3 (tons)	Cat. 4 (tons)	Cat. 5 (tons)	Cat. 6 (tons)	Cat. 19 (tons)	Cat. 20 (tons)	Cat. 21 (tons)	Cat. 22 (tons)	Cat. 23 (tons)	Cat. 24 (tons)	Cat. 25 (tons)	Cat. 26 (tons)	Cat. 27 (tons)	Cat. 28 (tons)	Cat. 29 (tons)	Cat. 30 (tons)	Cat. 31 (tons)	IL	IN	IA	MN	MI	Other	Estimated Site Life In Years
KESTREL HAWK LF	572	Racine	5,000,000	96,293	102,589	0	0	0	0	40,462	634	0	18,844	0	0	0	0	0	2,370	0	0	0	0	4,820	0	0	0	0	0	0
WMWI - METRO RECYCLING & DISPOSAL	1099	Milwaukee	5,175,000	0	104,146	0	0	4,622	5	22,296	94,184	0	9,599	35	23,255	0	2,886	0	0	0	0	0	0	39	0	18	0	0	0	1
DOMTAR AW LLC ASH BARK SITE	1365	Wood	1,260,000	427,506	0	0	0	0	0	847	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33
KOHLER CO LF	1508	Sheboygan	4,240,000	13,908	0	0	0	23,399	1,086	5,417	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
WATER RENEWAL CENTER LANDFILL	1686	Portage	1,551,000	414,206	0	0	11,919	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
FALK LANDFILL	1882	Milwaukee	569,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHEMTRADE SOLUTIONS LLC	1907	Winnebago	175,000	36,012	0	0	0	0	0	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
WPL-COLUMBIA ENERGY CENTER	2325	Columbia	500,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G-P CONSUMER OPERATIONS LLC GB WEST LF	2332	Brown	6,250,000	2,200,179	0	0	72,521	0	0	760	0	0	50,252	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27
WATER QUALITY CENTER LF	2488	Wood	679,384	2,856,989	0	13,343	61,690	0	0	9,358	0	0	28,911	0	0	0	317	0	0	0	0	0	0	0	0	0	0	0	0	24
DOMTAR AW LLC WASTEWATER TREATMENT LF	2613	Wood	2,736,369	594,025	0	0	10,896	0	0	8,546	604	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93
SUPERIOR CTY MOCCASIN MIKE LF	2627	Douglas	1,500,000	946,604	117,348	0	0	0	2,901	702	2,154	0	0	0	0	0	5,142	0	69	0	0	0	0	0	0	0	0	104,975	0	6
WEPCO PLEASANT PRAIRIE LF	2786	Kenosha	5,000,000	3,995,878	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
WEPCO HWY 32 LF	2801	Ozaukee	2,000,000	610,255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
AHLSTROM-MUNKSJÖ MOSINEE LLC	2806	Marathon	500,000	8,500	0	10,830	4,767	0	0	14,480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
WPL - EDGEWATER GENERATING STATION	2853	Sheboygan	1,150,000	820,923	0	15,932	0	0	0	0	0	0	0	0	0	0	726	0	0	0	0	0	0	0	0	0	0	0	0	55
GEORGIA PACIFIC CONSUMER OPERATIONS LLC	2893	Brown	750,000	127,459	0	0	5,685	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
ADVANCED DISP SERV CRANBERRY CREEK LF LLC	2967	Wood	1,200,000	2,307,622	158,439	28	0	504	1,370	21,858	0	0	24,465	10,474	16,440	0	10,704	0	57	0	0	1,930	0	0	0	479	0	0	0	7
GREDE LLC - REEDSBURG	2974	Sauk	375,000	111,033	0	0	0	11,657	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
DANE CNTY LF #2 RODEFELD	3018	Dane	650,000	2,457,921	179,688	0	0	0	0	770	27,034	0	0	0	348	0	10,143	0	0	0	0	6,086	15,242	0	0	0	0	0	0	8
WPL- COLUMBIA ENERGY CENTER	3025	Columbia	6,529,200	5,256,344	0	107,803	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30
LOHI FIONTAR LLC	3036	Outagamie	4,250,000	50,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
WMWI - VALLEY TRAIL RECYCLING & DISPOSAL	3066	Green Lake	2,813,000	3,999,271	91,151	0	9,968	14,999	0	19,758	3,854	0	74,385	0	13,772	0	2,934	0	776	0	0	0	0	0	0	0	0	0	0	14
WIS PUBLIC SERV CORP WESTON ASH DISP SITE #3	3067	Marathon	873,000	3,725,658	0	65,562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
GLACIER RIDGE LANDFILL LLC	3068	Dodge	3,885,800	4,388,437	450,130	0	0	24,061	4,746	24,673	7,711	0	92,057	22,986	3,712	23	19,734	0	13,091	0	0	1,637	1,316	0	0	802	0	0	0	4
SHAWANO CTY PHASE 2 LF	3069	Shawano	405,000	39,717	241	0	0	12,073	0	195	0	0	0	0	0	0	298	0	0	0	0	0	0	0	0	0	0	0	0	4
MAR-OCO LF	3095	Marinette	1,480,000	442,109	14,610	0	0	0	0	0	3,270	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
SEVEN MILE CREEK LANDFILL LLC	3097	Eau Claire	3,000,000	1,322,048	258,763	290	3,782	396	0	19,974	1,522	0	8,512	48,866	36,562	0	37,368	0	0	589	0	0	0	0	0	19	100,897	0	0	2
HWY G SANITARY LF	3100	Vilas	250,000	244,613	32,304	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,672	0	0	0	0	1,354	0	8
PACKAGING CORP OF AMERICA - TOMAHAWK LF	3114	Lincoln	2,800,000	1,334,622	0	19,128	6,599	0	370	319	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38
DAIRYLAND POWER COOP - CASSVILLE	3122	Grant	83,400	60,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HICKORY MEADOWS LANDFILL LLC	3134	Calumet	7,546,000	6,925,106	192,058	0	57,211	16,606	338	65,229	0	0	14,697	33,356	4,301	68,248	27,999	246,762	733	0	0	0	0	0	0	0	0	125	0	7
LINCOLN CNTY SANITARY LF	3141	Lincoln	825,000	1,037,912	30,352	0	117	0	459	281	1,150	0	0	0	4,533	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
ADAMS CNTY LF & RECYCLING CENTER	3150	Adams	700,000	-503,394	38,504	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	520	0	0	0	0	0	0	0	1
DEER TRACK PARK LANDFILL	3230	Jefferson	3,885,800	3,540,483	146,209	0	0	0	0	13,175	35,381	0	4,383	12,433	19,452	1,900	11,176	0	4	0	0	2,373	548	0	0	6,293	0	0	0	13
WEPCO CALEDONIA LF	3232	Racine		2,409,055	0	5,796	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
NORTHERN STATES POWER CO - WOODFIELD ASH LF	3233	Bayfield	255,000	131,378	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OUTAGAMIE CNTY NE LF (AREA 6)	3235	Outagamie	7,955,000	2,644,083	491,524	0	251	0	3,958	6,644	56,636	4,155	44,304	31,819	4,311	15,314	55,794	0	724	10	0	8,784	275	0	0	0	0	0	0	4
MALLARD RIDGE LANDFILL INC	3244	Walworth	5,197,000	1,659,734	140,017	0	0	331	0	33,167	3,979	0	21,583	26,776	1,038	0	30,712	0	2,625	0	0	2,842	0	38,993	0	0	0	0	0	4
RED HILLS LANDFILL - PHASES 5 & 6	3251	Outagamie	2,750,000	4,872,233	0	0	64,454	0	0	0	0	0	32,781	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
LA CROSSE CNTY LF MSW & ASH MONOFILL	3253	La Crosse	1,672,200	1,836,427	59,072	340	0	0	2,395	4,041	9,392	9,475	11,696	0	713	0	22,610	0	55	89	0	11	0	0	0	1,044	20,620	0	0	13
VERNON CNTY SOLID WASTE/RECYCLING FACILITY	3268	Vernon	283,448	97,681	18,897	0	0	0	0	0	0	0	0	0	0	0	1,290	0	0	0	0	0	0	0	0	0	0	0	0	6
GEORGIA PACIFIC NORTH LF	3275	Winnebago	3,062,000	10,317,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
EMERALD PARK LANDFILL LLC	3290	Waukesha	3,550,360	5,150,669	259,938	0	12,531	3,087	2,196	61,193	21,771	0	25,849	0	4,973	0	81,735	0	4,454	0	0	715	0	2,081	0	0	0	0	0	7
W M W I - MADISON PRAIRIE LF	3318	Dane	4,284,000	913,440	0	366	0	690	0	25,263	39,113	0	0	0	0	0	27,429	62	0	0	0	0	17,726	0	0	0	0	0	0	9
MARATHON CNTY AREA B LF	3338	Marathon	2,508,000	-12,597	71	0	0	0	0	1,092	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WMWI-ORCHARD RIDGE RECYCLING & DISPOSAL	3360	Waukesha	9,352,900	50,000	254,294	0	0	1,986	0	113,218	191,060	0	24,695	0	32,548	0	12,724	0	1,226	0	0	7,775	3,067	0	0	0	0	0	0	2
WAUPACA FOUNDRY INC LF #3	3412	Waupaca	1,339,000	929,274	0	0	0	59,527	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
WMWI- TIMBERLINE TRAIL RECYCLING & DISPOSAL	3455	Rusk	2,933,000	4,142,318	87,762	3,719	0	0	0	4,924	1,397	0	957	0	783	1,868	698	0	874	0	0	0	0	26	0	0	759	0	17	15
HARRISON LANDFILL	3458	Calumet	525,000	117,875	0	0	44,710	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
BFI WASTE SYSTEMS OF NORTH AMERICA LLC	3474	Washburn	4,347,900	5,707,624	153,342	0	0	0	0	12,682	0	24,399	0	0	6,055	0	3,573	0	0	0	0	0	0	0	0	0	60,360	0	0	37
MONROE CNTY RIDGEVILLE II SAN LF	3660	Monroe	997,500	85,901	43,910	0	0	0	0	76	987	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
WMWI - PHEASANT RUN RECYCLING & DISPOSAL	3765	Kenosha	487,000	9,040,800	104,536	0	0	0	8,182	26,003	21,229	0	528	18,538	6,291	40	16,615	0	117	0	0	927	0	6,569	0	0	0	0	0	53
JANESVILLE CTY LF (NEW)	3939	Rock	4,765,000	5,195,237	138,858	0	0	0	988	3,990	0	0	3,566	38,199	0	0	15,713	0	0	0	397	9,765	0	38,199	0	0	0	0	0	18
DAIRYLAND POWER COOP PHASE IV - BELVIDERE	4126	Buffalo	3,011,000	1,897,013	0	43,055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
MARATHON CNTY BLUE BIRD RIDGE RDF	4228	Marathon		1,231,487	165,747	1,482	7,036	0	1,989	12,215	0	0	20,832	0	0	0	14,338	0	9	100	0	0	0	0	0	0	0	0	0	0
WMWI -RIDGEVIEW RECYCLING & DISPOSAL - SOUTH	4292	Manitowoc	10,300,000	7,214,819	126,992	32,276	0	4,224	205	52,709	73,924	0	31,807	0	25,170	20,824	1,390	45,218	4,823	0	0	3,406	0	0	0	0	0	2,311	0	14
WMWI-ORCHARD RIDGE RECYCLING & DISPOSAL	4491	Waukesha	5,422,855	5,300,000	95,189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,507	895	0	0	0	0	0	0	
WMWI - METRO RECYCLING & DISPOSAL	4579	Milwaukee	9,653,185	8,970,800	364,799	0	0	4,127	52	53,910	68,057	0	8,823	2	8,537	0	4,555	0	285	0	0	16,889	13,931	196	0	0	0	0	0	13
Totals					4,421,479	319,949	374,137	182,288	31,241	680,356	665,044	38,029	553,526	243,485	212,805	108,217	418,603	292,042	32,292	787	397	67,167	56,672	90,924	0	8,656	287,611	3,790	17	
					Cat. 1 (tons)	Cat. 2 (tons)	Cat. 3 (tons)	Cat. 4 (tons)	Cat. 5 (tons)	Cat. 6 (tons)	Cat. 19 (tons)	Cat. 20 (tons)	Cat. 21 (tons)	Cat. 22 (tons)	Cat. 23 (tons)	Cat. 24 (tons)	Cat. 25 (tons)	Cat. 26 (tons)	Cat. 27 (tons)	Cat. 28 (tons)	Cat. 29 (tons)	Cat. 30 (tons)	Cat. 31 (tons)	IL	IN	IA	MN	MI	Other	

Last updated: May 2021

KEY

Category 1: Municipal Waste
Category 2: Utility Ash/Sludges
Category 3: Pulp/Papermill Mfg waste
Category 4: Foundry Waste
Category 5: POTW Sludges
Category 6: All other SW (not HW)
Category 19: Fee Exempt waste used for dikes, berms, etc
Category 20: Energy Recovery Incinerator Ash
Category 21: High Volume Industrial used for daily cover,etc
Category 22: Shredder Fluff used for daily cover
Category 23: Treated Contaminated Soil used for daily cover
Category 24: Exempt Unusable Paper Making Materials
Category 25: Construction & Demolition (C&D) Waste
Category 26: Sediments Contaminated with PCBs
Category 27: Waste Generated by a Non-Profit Org
Category 28: Waste Generated by Natural Disaster
Category 29: Waste Removed at Request of DNR to Mitigate Potential Env Impacts
Category 30: MRF Residuals – 10% cap
Category 31: MFR Residuals – 30% cap

Facility Name	WDNR Lic. No.	County	Initial or Original Capacity	Cap. as of Jan. 2019 In Cu Yds	Cat. 1 (tons)	Cat. 2 (tons)	Cat. 3 (tons)	Cat. 4 (tons)	Cat. 5 (tons)	Cat. 6 (tons)	Cat 2 - Cat 6 Total	Cat. 19 (tons)	Cat. 20 (tons)	Cat. 21 (tons)	Cat. 22 (tons)	Cat. 23 (tons)	Cat. 24 (tons)	Cat. 25 (tons)	Cat. 26 (tons)	Cat. 27 (tons)	Cat. 28 (tons)	Cat. 29 (tons)	Cat. 30 (tons)	Cat. 31 (tons)	Out-of-State Waste (in tons) Cat 1 - 31 Total	IL	IN	IA	MN	MI	Other	Estimated Site Life In Years
KESTREL HAWK LF	572	Racine	5,000,000	351,859	111,574	0	0	0	0	19,865	19,865	846	0	2,663	44,097	0	0	0	0	1,446	0	0	0	0	180,491	0	0	0	0	0	0	2
WMWI - METRO RECYCLING & DISPOSAL	1099	Milwaukee	5,175,000	0	204,736	0	0	10,171	49	64,097	74,317	57,128	0	18,809	23	14,977	0	9,706	0	385	11	0	1,762	11,909	393,763	0	0	0	0	0	0	1
DOMTAR AW LLC ASH BARK SITE	1365	Wood	1,260,000	428,562	0	0	0	0	0	840	840	0	0	0	0	0	0	0	0	0	0	0	0	0	840	0	0	0	0	0	0	60
KOHLER CO LF	1508	Sheboygan	4,240,000	36,058	0	0	0	16,469	1,221	5,829	23,519	0	0	0	0	0	0	0	0	0	0	0	0	0	23,519	0	0	0	0	0	0	5
WATER RENEWAL CENTER LANDFILL	1686	Portage	1,551,000	426,429	0	0	8,959	0	0	15	8,974	0	0	0	0	0	0	0	0	0	0	0	0	0	8,974	0	0	0	0	0	0	41
FALK LANDFILL	1882	Milwaukee	569,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
CHEMTRADE SOLUTIONS LLC	1907	Winnebago	175,000	36,167	0	0	0	0	0	55	55	0	0	0	0	0	0	0	0	0	0	0	0	0	55	0	0	0	0	0	0	15
WPL-COLUMBIA ENERGY CENTER	2325	Columbia	500,000	20,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
G-P CONSUMER OPERATIONS LLC GB WEST LF	2332	Brown	6,250,000	2,251,606	0	0	90,434	0	0	0	90,434	0	0	79,106	0	0	0	0	0	0	0	0	0	0	169,540	0	0	0	0	0	0	27
WATER QUALITY CENTER LF	2488	Wood	679,384	2,973,811	0	23,095	59,414	0	0	4,623	87,132	0	0	18,322	0	0	0	0	0	0	0	0	0	0	105,454	0	0	0	0	0	0	35
DOMTAR AW LLC WASTEWATER TREATMENT LF	2613	Wood	2,736,369	616,329	0	0	6,024	0	0	10,018	16,042	664	0	0	0	0	0	0	0	0	0	0	0	0	16,706	0	0	0	0	0	0	49
SUPERIOR CTY MOCCASIN MIKE LF	2627	Douglas	1,500,000	946,604	116,698	0	0	0	9,567	811	10,378	2,253	0	0	0	0	0	4,117	0	85	0	0	0	0	133,531	0	0	0	105,310	0	0	10
WEPCO PLEASANT PRAIRIE LF	2786	Kenosha	5.000.000	3.995.878	0	27.973	0	0	0	0	27.973	0	0	0	0	0	0	0	0	0	0	0	0	0	27.973	0	0	0	0	0	0	15
WEPCO HWY 32 LF	2801	Ozaukee	2.000.000	610.255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
AHLSTROM-MUNKSJO MOSINEE LLC	2806	Marathon	500,000	25,235	0	11,971	1,200	0	0	14,196	27,367	0	0	0	0	0	0	0	0	0	0	0	0	0	27,367	0	0	0	0	0	0	6
WPL - EDGEWATER GENERATING STATION	2853	Sheboygan	1,150,000	849,309	0	35,540	0	0	0	0	35,540	0	0	0	0	0	0	1,062	0	0	0	0	0	0	36,602	0	0	0	0	0	0	21
GEORGIA PACIFIC CONSUMER OPERATIONS LLC	2893	Brown	750,000	134,281	0	0	8,125	0	0	0	8,125	0	0	0	0	0	0	0	0	0	0	0	0	0	8,125	0	0	0	0	0	0	13
ADVANCED DISP SERV CRANBERRY CREEK LF LLC	2967	Wood	1,200,000	2,586,291	180,189	0	0	823	10	19,894	20,727	0	0	29,966	0	8,961	0	11,810	0	1,538	0	0	2,118	0	255,309	0	0	0	0	0	0	8
GREDE LLC - REEDSBURG	2974	Sauk	375,000	1	0	0	0	17,499	0	0	17,499	0	0	0	0	0	0	0	0	0	0	0	0	0	17,499	0	0	0	0	0	0	13
KEWAUNEE CNTY SOLID WASTE	2975	Kewaunee	517,000	0	5,937	0	0	0	0	0	0	4,564	0	1,275	0	0	0	1,258	0	0	0	0	0	0	13,034	0	0	0	0	0	0	1
DANE CNTY LF #2 RODEFELD	3018	Dane	650,000	2,750,022	177,816	0	0	0	0	906	906	25,155	0	0	0	0	0	11,065	0	0	2,129	0	5,904	17,787	240,762	0	0	0	0	0	0	11
WPL- COLUMBIA ENERGY CENTER	3025	Columbia	6,529,200	4,549,264	0	88,227	0	0	0	0	88,227	0	0	0	0	0	0	0	0	0	0	0	0	0	88,227	0	0	0	0	0	0	46
APPLETON COATED LLC - LOCKS MILL	3036	Outagamie	4,250,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
WMWI - VALLEY TRAIL RECYCLING & DISPOSAL	3066	Green Lake	2,813,000	4,174,313	101,117	0	9,037	16,904	0	23,564	49,505	14,167	0	76,963	0	7,837	0	2,295	0	684	7	0	0	0	252,575	0	0	0	0	0	0	15
WIS PUBLIC SERV CORP WESTON ASH DISP SITE #3	3067	Marathon	873,000	3.804.332	0	35.054	0	0	0	0	35.054	0	0	0	0	0	0	0	0	0	0	0	0	0	35.054	0	0	0	0	0	0	15
ADVANCED DISPOSAL SERVICES GLACIER RIDGE LLC	3068	Dodge	5.385.800	5.384.820	441.081	0	21.585	21.654	4.736	28.789	76.764	11.642	0	67.787	15.399	3.521	22	25.128	0	12.176	427	0	954	8.787	663.688	0	0	898	0	0	0	7
SHAWANO CTY PHASE 2 LF	3069	Shawano	405,000	49,343	0	0	0	15,487	0	455	15,942	1,373	0	0	0	0	0	30	0	0	0	0	0	0	17,345	0	0	0	0	0	0	5
MAR-OCO LF	3095	Marinette	1,480,000	471,691	14,654	0	0	0	0	0	0	2,485	0	0	0	2,810	0	0	0	0	0	0	0	0	19,949	0	0	0	0	0	0	19
ADVANCED DISP SERV SEVEN MILE CREEK LF	3097	Eau Claire	3,000,000	1,651,905	257,456	3,345	4,538	489	0	14,980	23,353	4,786	0	8,386	52,680	9,161	0	34,286	0	0	0	0	0	0	390,108	0	0	600	105,296	0	0	3
HWY G SANITARY LF	3100	Vilas	250,000	170,510	24,545	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,874	0	27,419	0	0	0	0	1,427	0	9
PACKAGING CORP OF AMERICA - TOMAHAWK LF	3114	Lincoln	2,800,000	1,369,340	0	15,404	8,250	0	0	349	24,003	0	0	0	0	0	0	0	0	0	0	0	0	0	24,003	0	0	0	0	0	0	39
DAIRYLAND POWER COOP - CASSVILLE	3122	Grant	83,400	60,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADVANCED DISP SERV HICKORY MEADOWS LF LLC	3134	Calumet	7,546,000	7,816,204	171,644	0	73,896	16,271	150	72,523	162,840	0	0	13,328	28,779	2,920	70,310	22,876	354,287	650	0	0	0	0	827,634	0	0	0	0	218	0	11
LINCOLN CNTY SANITARY LF	3141	Lincoln	825,000	1,079,391	25,470	0	69	0	0	456	525	1,149	0	0	0	7,871	0	0	0	0	0	0	0	0	35,015	0	0	0	0	0	0	20
ADAMS CNTY LF & RECYCLING CENTER	3150	Adams	700,000	84,336	27,811	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	192	0	0	0	28,003	0	0	0	0	0	0	4
WMWI- DEER TRACK PARK RDF	3230	Jefferson	3,885,800	3,775,925	132,909	3	0	0	0	14,987	14,990	21,074	0	4,854	12,654	3,051	616	14,696	0	0	0	0	2,074	573	207,491	0	0	0	0	0	0	15
WEPCO CALEDONIA LF	3232	Racine	2,416,010	0	7,408	0	0	0	0	0	7,408	0	0	0	0	0	0	0	0	0	0	0	0	0	7,408	0	0	0	0	0	0	15
NORTHERN STATES POWER CO - WOODFIELD ASH LF	3233	Bayfield	255.000	131.378	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OUTAGAMIE CNTY NE LF FAREA 6I	3235	Outagamie	7,955,000	3,370,339	467,882	777	2,158	0	742	5,603	9,280	50,254	0	52,948	29,609	6,234	12,922	23,215	0	1,438	0	0	9,063	37,190	700,035	0	0	0	0	0	0	6
ADVANCED DISP SVCS MIDWEST MALLARD RIDGE LF	3244	Walworth	5,197,000	2,058,376	173,263	0	0	483	0	37,063	37,546	4,359	0	25,118	33,454	1,074	0	34,371	0	2,176	833	0	6,453	0	318,647	46,389	0	0	0	0	0	7
RED HILLS LANDFILL - PHASES 5 & 6	3251	Outagamie	2,750,000	5,027,963	0	0	61,215	0	0	343	61,558	0	0	41,966	0	0	0	0	0	0	0	0	0	0	103,524	0	0	0	0	0	0	1
LA CROSSE CNTY LF MSW & ASH MONOFILL	3253	La Crosse	1,672,200	1,981,654	61,924	394	0	0	47	2,691	3,132	7,367	8,680	5,554	0	408	0	21,130	0	40	163	0	1	0	108,399	0	0	171	16,818	0	0	18
VERNON CNTY SOLID WASTE/RECYCLING FACILITY	3268	Vernon	283,448	132,714	12,337	0	0	0	83	0	83	283	0	0	0	0	0	3,295	0	0	1,784	0	0	0	17,783	0	0	0	0	0	0	6
GEORGIA PACIFIC NORTH LF	3275	Winnebago	3,062,000	10,317,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
ADVANCED DISPOSAL EMERALD PARK LANDFILL LLC	3290	Waukesha	3,550,360	5,897,424	267,684	0	18,034	3,636	3,716	60,499	85,885	72,806	0	43,929	0	1,164	0	64,821	0	3,389	0	0	3,958	0	543,636	3,663	0	0	0	0	0	9
W M W I - MADISON PRAIRIE LF	3318	Dane	4,284,000	1,015,550	0	409	0	849	0	24,768	26,026	27,083	0	0	0	22,884	0	23,484	0	0	255	8,508	0	0	108,240	0	0	0	0	0	0	15
MARATHON CNTY AREA B LF	3338	Marathon	2,508,000	-10,778	0	0	0	0	0	8,046	8,046	0	0	0	0	0	0	0	0	0	0	0	0	0	8,046	0	0	0	0	0	0	1
W M W I-ORCHARD RIDGE RECYCLING & DISPOSAL	3360	Waukesha	9,352,900	219,898	508,772	0	0	11,180	0	160,871	172,052	138,560	0	24,860	163	163,802	0	13,430	0	1,207	28	0	28,608	17,793	1,069,273	424	0	32	26	0	126	2
WAUPACA FOUNDRY INC LF #3	3412	Waupaca	1,339,000	973,368	0	0	0	63,336	0	0	63,336	0	0	0	0	0	0	0	0	0	0	0	0	0	63,336	0	0	0	0	0	0	10
WMWI- TIMBERLINE TRAIL RECYCLING & DISPOSAL	3455	Rusk	2,933,000	4,241,393	86,077	2,538	0	0	0	11,270	13,808	6,570	0	1,757	0	7,597	2,880	779	0	764	0	0	0	0	120,232	95	0	0	525	0	0	15
HARRISON LANDFILL	3458	Calumet	525,000	127,705	0	0	38,517	0	0	0	38,517	0	0	0	0	0	0	0	0	0	0	0	0	0	38,517	0	0	0	0	0	0	11
BFI WASTE SYSTEMS OF NORTH AMERICA LLC	3474	Washburn	4,347,900	5,993,221	106,547	0	64	0	0	6,863	6,927	2,476	25,411	0	0	0	0	2,972	0	0	0	0	0	0	144,333	0	0	0	18,272	0	0	42
MONROE CNTY RIDGEVILLE I SAN LF	3660	Monroe	997,500	133,253	40,206	0	0	783	0	773	1,556	1,255	0	0	0	110	0	0	0	0	0	0	0	0	43,127	0	0	0	0	0	0	5
WMWI - PHEASANT RUN RECYCLING & DISPOSAL	3765	Kenosha	487,000	9,183,165	174,456	0	0	11	7,065	27,096	34,172	25,080	0	379	4,543	4,711	1,192	12,591	0	125	0	0	0	0	257,249	6,357	0	0	0	0	0	53
JANESVILLE CTY LF (NEW)	3939	Rock	4,765,000	1,087,553	149,212	0	0	0	307	11,244	11,551	0	0	3,643	45,573	0	0	15,475	0	0	0	0	11,769	0	237,223	45,753	0	0	0	0	0	6
DAIRYLAND POWER COOP PHASE IV - BELVIDERE	4126	Buffalo	3,011,000	1,943,983	0	76,843	0	0	0	0	76,843	0	0	0	0	0	0	0	0	0	0	0	0	0	76,843	0	0	0	0	0	0	25
MARATHON CNTY BLUE BIRD RIDGE RDF	4228	Marathon		1,580,137	139,515	1,464	12,681	0	469	11,468	26,082	0	0	19,223	0	0	0	12,424	0	20	0	0	0	0	197,264	0	0	0	0	0	0	5
WMWI -RIDGEVIEW RECYCLING & DISPOSAL - SOUTH	4292	Manitowoc	10,300,000	7,640,696	104,632	65,376	0	5,184	237	54,072	124,869	68,274	0	34,297	0	0	14,402	1,102	0	4,394	0	0	2,662	0	354,632	0	0	25	0	10,924	0	35
WINNEBAGO CNTY SUNNYVIEW LF	4628	Winnebago		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
											0														0							
		Totals	150,679,261	118,942,273	4,286,143	395,821	424,201	201,229	28,399	719,923	1,769,573	551,653	34,091	575,133	266,975	269,093	102,344	367,419	354,287	30,516	5,637	8,508	75,518	96,913	8,793,802	102,681	0	1,726	246,246	12,569	126	877
			Initial or Original Capacity	Cap. as of Jan. 2019 In Cu Yds	Cat. 1 (tons)	Cat. 2 (tons)	Cat. 3 (tons)	Cat. 4 (tons)	Cat. 5 (tons)	Cat. 6 (tons)	Cat 2 - Cat 6 Total	Cat. 19 (tons)	Cat. 20 (tons)	Cat. 21 (tons)	Cat. 22 (tons)	Cat. 23 (tons)	Cat. 24 (tons)	Cat. 25 (tons)	Cat. 26 (tons)	Cat. 27 (tons)	Cat. 28 (tons)	Cat. 29 (tons)	Cat. 30 (tons)	Cat. 31 (tons)	Cat 1 - 31 Total	IL	IN	IA	MN	MI	Other	

KEY

Category 1: Municipal Waste
Category 2: Utility Ash/Sludges
Category 3: Pulp/Papermill Mfg waste
Category 4: Foundry Waste
Category 5: POTW Sludges
Category 6: All other SW (not HW)
Category 19: Fee Exempt waste used for dikes, berms, etc
Category 20: Energy Recovery Incinerator Ash
Category 21: High Volume Industrial used for daily cover,etc
Category 22: Shredder Fluff used for daily cover
Category 23: Treated Contaminated Soil used for daily cover
Category 24: Exempt Unusable Paper Making Materials
Category 25: Construction & Demolition (C&D) Waste
Category 26: Sediments Contaminated with PCBs
Category 27: Waste Generated by a Non-Profit Org
Category 28: Waste Generated by Natural Disaster
Category 29: Waste Removed at Request of DNR to Mitigate Potential Env Impacts
Category 30: MRF Residuals – 10% cap
Category 31: MFR Residuals – 30% cap

Facility Name	WDNR Lic. No.	County	Initial or Original Cap	Cap. as of Jan. 2018 In Cu Yds	Cat. 1 (tons)	Cat. 2 (tons)	Cat. 3 (tons)	Cat. 4 (tons)	Cat. 5 (tons)	Cat. 6 (tons)	Cat. 19 (tons)	Cat. 20 (tons)	Cat. 21 (tons)	Cat. 22 (tons)	Cat. 23 (tons)	Cat. 24 (tons)	Cat. 25 (tons)	Cat. 26 (tons)	Cat. 27 (tons)	Cat. 28 (tons)	Cat. 29 (tons)	Cat. 30 (tons)	Cat. 31 (tons)	Cat 1 - 31 Total	IL	IN	IA	MN	MI	Other	Total Out of State Waste (Note - this waste is included in the Cat 1-31 Totals)
KESTREL HAWK LF	572	Racine	5,000,000	609,875	96,775	0	0	0	0	64,692	5,272	0	25,688	43,837	0	0	0	0	1,159	0	0	0	0	237,425	2,257	0	0	0	0	0	2,257
W M W I - METRO RECYCLING & DISPOSAL	1099	Milwaukee	5,175,000	219,086	220,424	0	0	6,671	4,340	67,791	66,586	0	20,033	0	11,630	0	1,390	0	277	0	0	801	13,056	412,999	4,094	0	0	0	0	0	4,094
DOMTAR AW LLC ASH BARK SITE	1365	Wood	1,260,000	429,609	0	0	0	0	0	840	0	0	0	0	0	0	0	0	0	0	0	0	0	840	0	0	0	0	0	0	0
KOHLER CO LF	1508	Sheboygan	4,240,000	56,763	0	0	0	13,129	1,223	2,372	0	0	0	0	0	0	0	0	0	0	0	0	0	16,724	0	0	0	0	0	0	0
WATER RENEWAL CENTER LANDFILL	1686	Portage	1,551,000	436,398	0	0	10,965	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	11,005	0	0	0	0	0	0	0
FALK LANDFILL	1882	Milwaukee	569,000	170,083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHEMTRADE SOLUTIONS LLC	1907	Winnebago	175,000	36,167	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0
WPL - COLUMBIA ENERGY CENTER	2325	Columbia	500,000	20,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G-P CONSUMER OPERATIONS LLC GB WEST LF	2332	Brown	6,250,000	2,295,401	0	0	76,090	0	0	0	0	0	20,855	0	0	0	0	0	0	0	0	0	0	96,945	0	0	0	0	0	0	0
WATER QUALITY CENTER LF	2488	Wood	679,384	3,082,101	0	26,723	31,060	0	0	14,043	0	0	16,949	0	0	0	0	0	0	0	0	0	0	88,774	0	0	0	0	0	0	0
DOMTAR AW LLC WASTEWATER TREATMENT LF	2613	Wood	2,736,369	635,774	0	0	2,088	0	0	5,277	0	0	0	0	0	0	0	0	0	0	0	0	0	7,365	0	0	0	0	0	0	0
SUPERIOR CTY MOCCASIN MIKE LF	2627	Douglas	1,500,000	1,160,282	115,212	0	0	0	3,141	1,192	3,935	0	0	0	3	0	4,693	0	103	0	0	0	0	128,279	0	0	0	104,592	0	0	104,592
WEPCO PLEASANT PRAIRIE LF	2786	Kenosha	5,000,000	4,019,189	0	3,033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,033	0	0	0	0	0	0	0
WEPCO HWY 32 LF	2801	Ozaukee	2,000,000	610,255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPERA MOSINEE LLC	2806	Marathon	500,000	29,510	0	11,222	2,211	0	0	7,111	0	0	0	0	0	0	0	0	0	0	0	0	0	20,544	0	0	0	0	0	0	0
WPL - EDGEWATER GENERATING STATION	2853	Sheboygan	1,150,000	949,132	0	49,365	0	0	0	0	0	0	0	0	0	0	3,231	0	0	0	0	0	0	52,596	0	0	0	0	0	0	0
GEORGIA PACIFIC CONSUMER PROD LP GB NORTHLAN	2893	Brown	750,000	144,031	0	0	8,995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,995	0	0	0	0	0	0	0
ADVANCED DISP SERV CRANBERRY CREEK LF LLC	2967	Wood	1,200,000	2,894,062	184,103	327	0	1,440	1,762	18,102	0	0	32,770	1,759	19,370	0	9,406	0	0	0	0	0	0	271,132	0	0	0	0	0	0	0
GREDE LLC - REEDSBURG	2974	Sauk	375,000	216,911	0	0	0	21,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21,200	0	0	0	0	0	0	0
RIVERVIEW TRANSFER & RECYCLING	2975	Kewaunee	517,000	21,521	17,160	0	0	0	0	0	9,576	0	5,578	1,629	0	0	1,311	0	0	0	0	0	0	35,254	0	0	0	0	0	0	0
DANE CNTY LF #2 RODEFELD	3018	Dane	650,000	3,044,459	170,141	0	0	0	0	909	32,853	0	0	0	0	0	7,595	0	0	0	0	5,904	17,787	235,189	0	0	0	0	0	0	0
WPL - COLUMBIA ENERGY CENTER	3025	Columbia	6,529,200	4,622,786	0	93,565	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93,565	0	0	0	0	0	0	0
APPLETON COATED LLC - LOCKS MILL	3036	Outagamie	4,250,000	28,309	0	1,200	8,325	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,525	0	0	0	0	0	0	0
W M W I - VALLEY TRAIL	3066	Green Lake	2,813,000	4,383,185	99,219	0	0	16,861	0	47,309	41,877	0	71,038	0	6,901	0	2,867	0	603	0	0	0	0	286,675	0	0	0	0	0	0	0
WIS PUBLIC SERV CORP WESTON ASH DISP SITE #3	3067	Marathon	873,000	3,833,544	0	51,796	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51,796	0	0	0	0	0	0	0
ADVANCED DISPOSAL SERVICES GLACIER RIDGE LLC	3068	Dodge	3,885,800	6,381,582	396,281	0	54,920	17,614	6,250	34,763	1,639	0	49,983	8,145	9,062	81	26,089	0	11,005	0	0	845	7,922	624,599	0	0	1,428	0	0	0	1,428
SHAWANO CTY PHASE 2 LF	3069	Shawano	405,000	62,011	0	0	0	13,327	0	637	916	0	0	0	0	0	562	0	0	0	0	0	0	15,442	0	0	0	0	0	0	0
MAR-OCO LF	3095	Marinette	1,480,000	503,837	13,974	0	0	0	0	0	2,318	0	0	0	0	0	0	0	0	0	0	0	0	16,292	0	0	0	0	0	0	0
ADVANCED DISP SERV SEVEN MILE CREEK LF LLC	3097	Eau Claire	3,000,000	1,324,790	292,191	297	3,094	895	0	12,567	7,145	0	17,669	56,483	7,796	0	33,242	0	0	0	0	0	0	431,379	0	0	217	144,707	0	0	144,924
HWY G SANITARY LF	3100	Vilas	250,000	214,611	22,218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,658	0	0	24,876	0	0	0	0	1,994	0	1,994
PACKAGING CORP OF AMERICA - TOMAHAWK LF	3114	Lincoln	2,800,000	1,401,320	0	15,808	8,702	0	0	339	0	0	0	0	0	569	0	0	0	0	0	0	0	25,418	0	0	0	0	0	0	0
DAIRYLAND POWER COOP - CASSVILLE	3122	Grant	83,400	60,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADVANCED DISP SERV HICKORY MEADOWS LF LLC	3134	Calumet	7,546,000	8,536,043	174,314	0	81,497	13,593	142	68,431	0	0	7,342	24,905	7,744	62,816	22,157	346,945	159	0	0	0	0	810,045	0	0	0	0	4,658	0	4,658
LINCOLN CNTY SANITARY LF	3141	Lincoln	825,000	1,124,727	26,361	0	6,812	0	0	318	1,896	0	0	0	6,470	0	0	0	0	0	0	0	0	41,857	0	0	0	0	0	0	0
ADAMS CNTY LF & RECYCLING CENTER	3150	Adams	700,000	124,340	21,644	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	96	0	21,740	0	0	0	0	0	0	0
DEER TRACK PARK RDF	3230	Jefferson	3,885,800	4,020,298	124,909	0	0	0	0	11,760	35,473	0	4,080	8,742	4,020	37	7,042	0	0	0	0	1,104	1,063	198,230	0	0	0	0	0	0	0
WEPCO CALEDONIA LF	3232	Racine		2,422,183	0	10,080	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,080	0	0	0	0	0	0	0
NORTHERN STATES POWER CO - WOODFIELD ASH LF	3233	Bayfield	255,000	131,378	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OUTAGAMIE CNTY NE LF (AREA 6)	3235	Outagamie	7,955,000	3,083,697	448,513	0	13,128	0	356	3,410	68,288	141	35,699	17,795	0	7,860	13,519	0	1,106	0	0	8,834	41,889	660,539	0	0	0	0	0	0	0
ADVANCED DISPOSAL SERVICES MALLARD RIDGE LLC	3244	Walworth	5,197,000	2,542,000	191,527	0	0	535	0	29,931	0	0	23,331	0	242	0	31,035	0	1,967	0	0	6,256	0	284,824	8,495	0	0	0	0	0	8,495
RED HILLS LANDFILL - PHASES 5 & 6	3251	Outagamie	2,750,000	370,596	0	0	66,831	0	0	3,051	0	0	41,423	0	0	0	0	0	0	0	0	0	0	111,305	0	0	0	0	0	0	0
LA CROSSE CNTY LF MSW & ASH MONOFILL	3253	La Crosse	1,672,200	2,139,600	59,123	427	0	0	90	2,503	12,688	9,044	4,370	0	651	0	22,744	0	146	185	0	0	0	111,970	0	0	209	17,061	0	0	17,271
VERNON CNTY SOLID WASTE/RECYCLING FACILITY	3268	Vernon	283,448	166,211	11,893	0	0	0	0	0	0	0	0	0	0	0	4,098	0	0	0	0	0	0	15,991	0	0	0	0	0	0	0
GEORGIA PACIFIC NORTH LF	3275	Winnebago	3,062,000	10,317,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADVANCED DISPOSAL EMERALD PARK LANDFILL LLC	3290	Waukesha	3,550,360	6,702,286	251,164	0	10,426	3,601	1,381	70,126	50,100	0	37,494	0	311	0	64,308	0	4,542	0	0	4,062	0	497,515	1,279	0	0	0	0	0	1,279
W M W I - MADISON PRAIRIE LF	3318	Dane	4,284,000	1,058,953	0	329	0	1,014	0	23,759	36,721	0	0	0	43,895	0	19,095	0	0	0	0	0	0	124,813	0	0	0	0	0	0	0
MARATHON CNTY AREA B LF	3338	Marathon	2,508,000	2,632	0	0	0	0	0	3,517	0	0	0	0	0	0	5	0	0	0	0	0	0	3,522	0	0	0	0	0	0	0
W M W I-ORCHARD RIDGE RECYCLING & DISPOSAL	3360	Waukesha	9,352,900	1,624,626	544,206	0	0	10,927	0	85,429	138,525	0	24,315	0	98,979	0	9,882	0	1,007	0	0	24,139	21,881	959,290	343	0	1	0	0	0	345
WAUPACA FOUNDRY INC LF #3	3412	Waupaca	1,339,000	1,020,284	0	0	0	60,285	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60,285	0	0	0	0	0	0	0
WASTE MANAGEMENT WI - TIMBERLINE TRAIL RDF	3455	Rusk	2,933,000	4,370,221	88,704	0	139	0	0	15,050	1,441	0	1,139	0	5,339	2,877	4,660	0	750	0	0	0	0	120,099	0	0	1,702	372	0	0	2,074
HARRISON LANDFILL	3458	Calumet	525,000	188,843	0	1,642	108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,750	0	0	0	0	0	0	0
BFI WASTE SYSTEMS OF NORTH AMERICA LLC	3474	Washburn	4,347,900	6,096,553	105,383	0	0	52	66	5,558	1,243	27,999	0	0	600	0	4,748	0	0	0	0	0	0	145,649	0	0	0	17,457	0	0	17,457
MONROE CNTY RIDGEVILLE II SAN LF	3660	Monroe	997,500	180,763	40,034	0	0	0	0	186	1,475	0	0	0	0	0	0	0	0	0	0	0	0	41,695	0	0	0	0	0	0	0
W M W I - PHEASANT RUN RECYCLING & DISPOSAL	3765	Kenosha	487,000	8,023,881	110,261	0	0	12	7,212	15,809	18,689	0	298	0	3,532	1,476	10,704	0	211	0	0	0	0	168,204	5,893	0	0	0	0	0	5,893
JANESVILLE CTY LF (NEW)	3939	Rock	4,765,000	1,359,844	151,383	0	0	0	472	7,632	0	0	3,391	67,436	0	0	14,092	0	0	0	0	8,171	0	252,577	67,436	0	0	0	0	0	67,436
DAIRYLAND POWER COOP PHASE IV - BELVIDERE	4126	Buffalo	3,011,000	3,000,000	0	66,564	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66,564	0	0	0	0	0	0	0
MARATHON CNTY BLUE BIRD RIDGE RDF	4228	Marathon		1,882,468	138,448	1,428	5,010	59	0	13,715	0	0	20,584	0	0	0	10,270	0	8	0	0	0	0	189,522	0	0	0	0	0	0	0
RIDGEVIEW RECYCLING & DISPOSAL - SOUTH	4292	Manitowoc	10,300,000	7,887,143	106,526	40,625	0	5,767	180	64,656	57,782	0	35,240	0	0	9,671	1,226	0	4,204	0	0	4,486	0	330,363	0	0	0	0	606	0	606
WINNEBAGO CNTY SUNNYVIEW LF	4628	Winnebago		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Totals	150,679,261	122,273,354	4,222,091	374,431	390,401	186,983	26,615	702,865	596,438	37,184	499,270	230,731	226,544	85,388	329,971	346,945	27,247	185	0	69,450	103,597	8,456,336	89,798	0	3,557	284,189	7,258	0	384,802
					Cat. 1 (tons)	Cat. 2 (tons)	Cat. 3 (tons)	Cat. 4 (tons)	Cat. 5 (tons)	Cat. 6 (tons)	Cat. 19 (tons)	Cat. 20 (tons)	Cat. 21 (tons)	Cat. 22 (tons)	Cat. 23 (tons)	Cat. 24 (tons)	Cat. 25 (tons)	Cat. 26 (tons)	Cat. 27 (tons)	Cat. 28 (tons)	Cat. 29 (tons)	Cat. 30 (tons)	Cat. 31 (tons)	Cat 1 - 31 Total	IL	IN	IA	MN	MI	Other	Totals

KEY

Category 1: Municipal Waste
Category 2: Utility Ash/Sludges
Category 3: Pulp/Papermill Mfg waste
Category 4: Foundry Waste
Category 5: POTW Sludges
Category 6: All other SW (not HW)
Category 19: Fee Exempt waste used for dikes, berms, etc
Category 20: Energy Recovery Incinerator Ash
Category 21: High Volume Industrial used for daily cover,etc
Category 22: Shredder Fluff used for daily cover
Category 23: Treated Contaminated Soil used for daily cover
Category 24: Exempt Unusable Paper Making Materials
Category 25: Construction & Demolition (C&D) Waste
Category 26: Sediments Contaminated with PCBs
Category 27: Waste Generated by a Non-Profit Org
Category 28: Waste Generated by Natural Disaster
Category 29: Waste Removed at Request of DNR to Mitigate Potential Env Impacts
Category 30: MRF Residuals – 10% cap
Category 31: MFR Residuals – 30% cap

Facility Name	WDNR Lic No.	County	Initial or Original Capacity	Cap as of Jan. of report year in Cu Yds	Cat. 01 (tons)	Cat. 02 (tons)	Cat. 03 (tons)	Cat. 04 (tons)	Cat. 05 (tons)	Cat. 06 (tons)	Cat 2 - Cat 6 Total	Cat. 19 (tons)	Cat. 20 (tons)	Cat. 21 (tons)	Cat. 22 (tons)	Cat. 23 (tons)	Cat. 24 (tons)	Cat. 25 (tons)	Cat. 26 (tons)	Cat. 27 (tons)	Cat. 28 (tons)	Cat. 29 (tons)	Cat. 30 (tons)	Cat. 31 (tons)	Cat 1 - 31 Total	Out-of-State Waste (in tons) IA	IL	IN	MI	MN	Other
KESTREL HAWK LF	572	Racine	5,000,000	940,542	90,208	0	0	0	0	25,101	25,101	1,617	0	163	35,087	0	0	0	0	1,262	0	0	0	309	153,747	0	682	0	0	0	0
W M W I - METRO RECYCLING & DISPOSAL	1099	Milwaukee	5,175,000	632,085	233,613	0	0	5,823	5,261	41,197	52,281	59,239	0	20,718	0	8,943	0	1,746	0	0	0	0	363	11,615	388,517	28	4,650	0	0	0	0
DOMTAR AW LLC ASH BARK SITE	1365	Wood	1,260,000	430,656	0	0	0	0	0	824	824	0	0	0	0	0	0	0	0	0	0	0	0	0	824	0	0	0	0	0	0
KOHLER CO LF	1508	Sheboygan	4,240,000	69,151	0	0	0	13,076	1,248	2,106	16,430	0	0	0	0	0	0	0	0	0	0	0	0	0	16,430	0	0	0	0	0	0
WATER RENEWAL CENTER LANDFILL	1686	Portage	1,551,000	457,867	0	0	9,246	0	0	36	9,282	0	0	0	0	0	0	0	0	0	0	0	0	0	9,282	0	0	0	0	0	0
FALK LANDFILL	1882	Milwaukee	569,000	170,083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHEMTRADE SOLUTIONS LLC	1907	Winnebago	175,000	36,211	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WPL - COLUMBIA ENERGY CENTER	2325	Columbia	500,000	20,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GEORGIA-PACIFIC CONSUMER PROD LP GB WEST LF	2332	Brown	6,250,000	2,358,148	0	0	118,663	0	0	0	118,663	0	0	58,521	0	0	0	0	0	0	0	0	0	0	177,184	0	0	0	0	0	0
WATER QUALITY CENTER LF	2488	Wood	679,384	3,169,615	0	30,520	29,231	0	0	3,779	63,530	13,952	0	0	0	0	0	37	0	0	0	0	0	0	77,519	0	0	0	0	0	0
DOMTAR AW LLC WASTEWATER TREATMENT LF	2613	Wood	2,736,369	645,207	0	0	96	0	0	5,578	5,674	0	0	0	0	2	0	0	0	0	0	0	0	0	5,676	0	0	0	0	0	0
SUPERIOR CTY MOCCASIN MIKE LF	2627	Douglas	1,500,000	548,685	114,702	0	0	0	2,544	984	3,527	25,398	0	4,668	0	3,830	0	5,226	0	53	0	0	0	0	157,405	0	0	0	0	102,810	0
WEPCO PLEASANT PRAIRIE LF	2786	Kenosha	5,000,000	4,021,716	0	3,492	0	0	0	0	3,492	0	0	0	0	0	0	0	0	0	0	0	0	0	3,492	0	0	0	0	0	0
WEPCO HWY 32 LF	2801	Ozaukee	2,000,000	610,255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPERA MOSINEE LLC	2806	Marathon	500,000	24,685	0	11,628	12,563	0	0	5,920	30,111	0	0	0	0	0	0	0	0	0	0	0	0	0	30,111	0	0	0	0	0	0
WASHINGTON ISLAND LF/COMPOST SITE	2837	Door	9,320	760	0	0	0	0	0	0	0	275	0	0	0	0	0	135	0	0	0	0	0	0	410	0	0	0	0	0	0
WPL - EDGEWATER GENERATING STATION	2853	Sheboygan	1,150,000	995,439	0	26,966	0	0	0	0	26,966	0	0	0	0	0	0	878	0	0	0	0	0	0	27,844	0	0	0	0	0	0
GEORGIA PACIFIC CONSUMER PROD LP GB NORTHLAN	2893	Brown	750,000	154,825	0	0	8,905	0	0	0	8,905	0	0	0	0	0	0	0	0	0	0	0	0	0	8,905	0	0	0	0	0	0
ADVANCED DISP SERV CRANBERRY CREEK LF LLC	2967	Wood	1,200,000	3,226,792	157,795	11	0	2,205	2,404	18,807	23,427	0	0	42,983	0	6,701	0	9,704	0	0	0	0	2,097	0	242,707	0	0	0	0	0	0
GREDE LLC - REEDSBURG	2974	Sauk	375,000	233,219	0	0	0	18,995	0	0	18,995	0	0	0	0	0	0	0	0	0	0	0	0	0	18,995	0	0	0	0	0	0
KEWAUNEE CNTY SOLID WASTE	2975	Kewaunee	517,000	55,816	22,125	0	0	0	0	0	0	4,986	0	2,411	3,340	0	0	1,962	0	0	0	0	0	0	34,824	0	0	0	0	0	0
DANE CNTY LF #2 RODEFELD	3018	Dane	650,000	3,330,005	165,811	0	0	0	0	1,045	1,045	20,187	0	0	0	0	0	8,434	0	0	0	0	6,182	12,466	214,125	0	0	0	0	0	0
WPL - COLUMBIA ENERGY CENTER	3025	Columbia	6,529,200	5,465,442	0	130,151	0	0	0	0	130,151	0	0	0	0	0	0	0	0	0	0	0	0	0	130,151	0	0	0	0	0	0
APPLETON COATED LLC - LOCKS MILL	3036	Outagamie	4,250,000	19,591	0	445	887	0	0	0	1,332	0	0	0	0	0	0	0	0	0	0	0	0	0	1,332	0	0	0	0	0	0
W M W I - VALLEY TRAIL	3066	Green Lake	2,813,000	4,600,017	95,483	0	372	15,971	0	22,874	39,217	467	0	65,299	0	13,586	0	4,579	0	696	0	0	0	0	219,327	0	0	0	0	0	0
WIS PUBLIC SERV CORP WESTON ASH DISP SITE #3	3067	Marathon	873,000	3,876,707	0	238,551	0	0	0	0	238,551	0	0	0	0	0	0	0	0	0	0	0	0	0	238,551	0	0	0	0	0	0
ADVANCED DISPOSAL SERVICES GLACIER RIDGE LLC	3068	Dodge	3,885,800	7,309,075	376,097	0	62,231	9,204	6,901	34,793	113,128	50,024	0	0	7,780	1,810	32	28,464	0	9,348	0	54	881	8,801	596,418	2,458	0	0	0	0	0
SHAWANO CTY PHASE 2 LF	3069	Shawano	405,000	73,806	0	0	0	10,207	0	373	10,580	65	0	0	0	0	0	561	0	0	0	0	0	0	11,206	0	0	0	0	0	0
MAR-OCO LF	3095	Marinette	1,480,000	530,836	17,687	0	0	0	0	0	0	7,475	0	0	0	0	0	0	0	0	0	0	0	0	25,162	0	0	0	0	0	0
ADVANCED DISP SERV SEVEN MILE CREEK LF LLC	3097	Eau Claire	3,000,000	2,000,000	266,785	379	2,459	910	0	11,521	15,269	5,008	0	24,669	59,294	2,731	0	28,312	0	0	0	0	0	0	402,068	709	0	0	0	131,385	0
HWY G SANITARY LF	3100	Vilas	250,000	247,188	21,092	0	0	0	0	0	0	95	0	0	0	0	0	0	0	0	0	0	2,207	0	23,394	0	0	0	1,099	0	0
PACKAGING CORP OF AMERICA - TOMAHAWK LF	3114	Lincoln	2,800,000	1,437,128	0	15,229	8,566	0	0	377	24,172	0	0	0	0	0	0	0	0	0	0	0	0	0	24,172	0	0	0	0	0	0
DAIRYLAND POWER COOP - CASSVILLE	3122	Grant	83,400	60,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADVANCED DISP SERV HICKORY MEADOWS LF LLC	3134	Calumet	7,546,000	9,294,257	187,398	0	79,408	13,587	127	41,500	134,622	4,482	0	7,318	14,890	14,542	53,722	16,309	353,169	0	0	0	0	0	786,452	0	0	0	920	0	0
LINCOLN CNTY SANITARY LF	3141	Lincoln	825,000	1,157,654	22,449	0	6,634	0	0	447	7,081	12,903	0	0	0	7,133	0	0	0	0	0	0	0	0	49,566	0	0	0	0	0	0
ADAMS CNTY LF & RECYCLING CENTER	3150	Adams	700,000	155,397	20,143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	172	0	20,315	0	0	0	0	0	0
DEER TRACK PARK RDF	3230	Jefferson	3,885,800	4,186,850	124,639	0	0	0	28	14,276	14,304	1,720	0	2,807	7,133	397	0	5,228	0	0	0	0	625	0	156,853	0	0	0	0	0	0
WEPCO CALEDONIA LF	3232	Racine	NA	2,430,583	0	5,274	0	0	0	0	5,274	0	0	0	0	0	0	0	0	0	0	0	0	0	5,274	0	0	0	0	0	0
NORTHERN STATES POWER CO - WOODFIELD ASH LF	3233	Bayfield	255,000	131,378	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OUTAGAMIE CNTY NE LF (AREA 6)	3235	Outagamie	7,955,000	4,044,335	432,694	0	0	0	275	3,608	3,883	46,252	25	47,042	565	0	7,044	27,294	0	1,692	0	0	8,417	30,829	605,736	0	0	0	0	0	0
ADVANCED DISPOSAL SERVICES MALLARD RIDGE LLC	3244	Walworth	5,197,000	2,998,176	197,356	0	0	540	0	27,133	27,673	0	0	21,876	0	784	0	29,260	0	1,446	0	0	5,672	0	284,067	0	6,156	0	0	0	0
RED HILLS LANDFILL - PHASE V	3251	Outagamie	2,750,000	543,116	0	0	68,641	0	0	125	68,766	0	0	25,845	0	0	0	0	0	0	0	0	0	0	94,611	0	0	0	0	0	0
LA CROSSE CNTY LF MSW & ASH MONOFILL	3253	La Crosse	1,672,200	2,284,320	55,091	429	0	0	83	4,178	4,689	21,226	9,561	3,661	0	1,827	0	21,026	0	488	0	0	0	0	117,569	341	0	0	0	25,510	0
VERNON CNTY SOLID WASTE/RECYCLING FACILITY	3268	Vernon	283,448	187,391	13,615	0	0	0	0	0	0	0	0	0	0	0	0	3,805	0	0	0	0	0	0	17,420	0	0	0	0	0	0
GEORGIA PACIFIC NORTH LF	3275	Winnebago	3,062,000	10,317,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADVANCED DISPOSAL EMERALD PARK LANDFILL LLC	3290	Waukesha	3,550,360	7,457,926	228,917	0	9,175	3,141	107	54,344	66,767	59,208	0	41,927	0	6,063	0	60,089	0	3,550	0	0	5,317	0	471,838	0	0	0	0	0	0
W M W I - MADISON PRAIRIE LF	3318	Dane	4,284,000	1,142,347	0	402	0	680	0	21,261	22,342	12,571	0	0	733	33,415	0	19,729	0	0	0	0	0	0	88,791	101	0	0	0	0	0
MARATHON CNTY AREA B LF	3338	Marathon	2,508,000	8,502	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
W M W I-ORCHARD RIDGE RECYCLING & DISPOSAL	3360	Waukesha	9,352,900	1,613,223	534,200	5	0	9,399	0	125,206	134,610	384,299	0	23,181	0	131,034	0	9,787	0	983	0	0	24,491	27,777	1,270,362	56	513	0	0	60	2
WAUPACA FOUNDRY INC LF #3	3412	Waupaca	1,339,000	1,064,940	0	0	0	58,464	0	0	58,464	0	0	0	0	0	0	0	0	0	0	0	0	0	58,464	0	0	0	0	0	0
WASTE MANAGEMENT WI - TIMBERLINE TRAIL RDF	3455	Rusk	2,933,000	4,519,510	85,811	0	0	0	0	2,662	2,662	3,461	0	3,148	0	2,512	2,812	724	0	534	0	0	0	0	101,665	0	0	0	0	1,474	0
APPLETON COATED LLC	3458	Calumet	525,000	190,761	0	4,929	0	0	0	0	4,929	0	0	0	0	0	0	0	0	0	0	0	0	0	4,929	0	0	0	0	0	0
BFI WASTE SYSTEMS OF NORTH AMERICA LLC	3474	Washburn	4,347,900	6,214,287	99,743	0	0	84	107	4,654	4,845	0	25,055	0	0	20	0	4,552	0	0	0	0	0	0	134,215	0	0	0	0	19,986	0
MONROE CNTY RIDGEVILLE II SAN LF	3660	Monroe	997,500	223,290	37,576	0	0	0	0	737	737	1,205	0	0	0	0	0	0	0	0	0	0	0	0	39,518	0	0	0	0	0	0
W M W I - PHEASANT RUN RECYCLING & DISPOSAL	3765	Kenosha	487,000	8,192,085	117,240	0	0	0	8,521	10,552	19,073	839	0	369	0	2,097	1,475	9,202	0	134	0	0	0	0	150,428	0	9,028	0	0	0	0
JANESVILLE CTY LF (NEW)	3939	Rock	4,765,000	1,605,322	135,286	0	0	0	528	2,392	2,920	0	0	3,303	42,444	0	0	15,361	0	0	0	0	8,013	0	207,327	0	42,444	0	0	0	0
DAIRYLAND POWER COOP PHASE IV - BELVIDERE	4126	Buffalo	3,011,000	2,100,015	0	72,722	0	0	0	0	72,722	0	0	0	0	0	0	0	0	0	0	0	0	0	72,722	0	0	0	0	0	0
MARATHON CNTY BLUE BIRD RIDGE RDF	4228	Marathon	NA	2,176,975	154,232	1,453	3,243	0	0	14,696	19,392	0	0	23,918	0	0	0	12,660	0	8	0	0	0	0	210,210	0	0	0	0	0	0
RIDGEVIEW RECYCLING & DISPOSAL - SOUTH	4292	Manitowoc	10,300,000	8,223,005	100,648	24,032	0	15,985	201	30,330	70,548	34,331	0	24,946	0	11,692	7,716	2,125	6,692	3,178	0	0	5,111	0	266,987	0	0	0	4,099	0	0
WINNEBAGO CNTY SUNNYVIEW LF	4628	Winnebago	NA	0	0	143	26,380	0	0	0	26,523	0	0	97,288	0	0	0	0	0	0	0	0	0	0	123,811	0	0	0	0	0	0
Totals			150,688,581	130,214,397	4,108,436	566,761	446,700	178,271	28,334	533,413	1,753,479	771,286	34,641	546,059	171,266	249,118	72,801	327,188	359,861	23,370	0	54	69,548	91,797	8,578,905	3,693	63,473	0	6,117	281,225	2

Facility Name	WDNR Lic No.	County	Initial or Original Capacity	Cap as of Jan. of report year in Cu Yds	Cat. 01 (tons)	Cat. 02 (tons)	Cat. 03 (tons)	Cat. 04 (tons)	Cat. 05 (tons)	Cat. 06 (tons)	Cat 2 - Cat 6 Total	Cat. 19 (tons)	Cat. 20 (tons)	Cat. 21 (tons)	Cat. 22 (tons)	Cat. 23 (tons)	Cat. 24 (tons)	Cat. 25 (tons)	Cat. 26 (tons)	Cat. 27 (tons)	Cat. 28 (tons)	Cat. 29 (tons)	Cat. 30 (tons)	Cat. 31 (tons)	Cat 1 - 31 Total	IA	IL	IN	MI	MN	Other

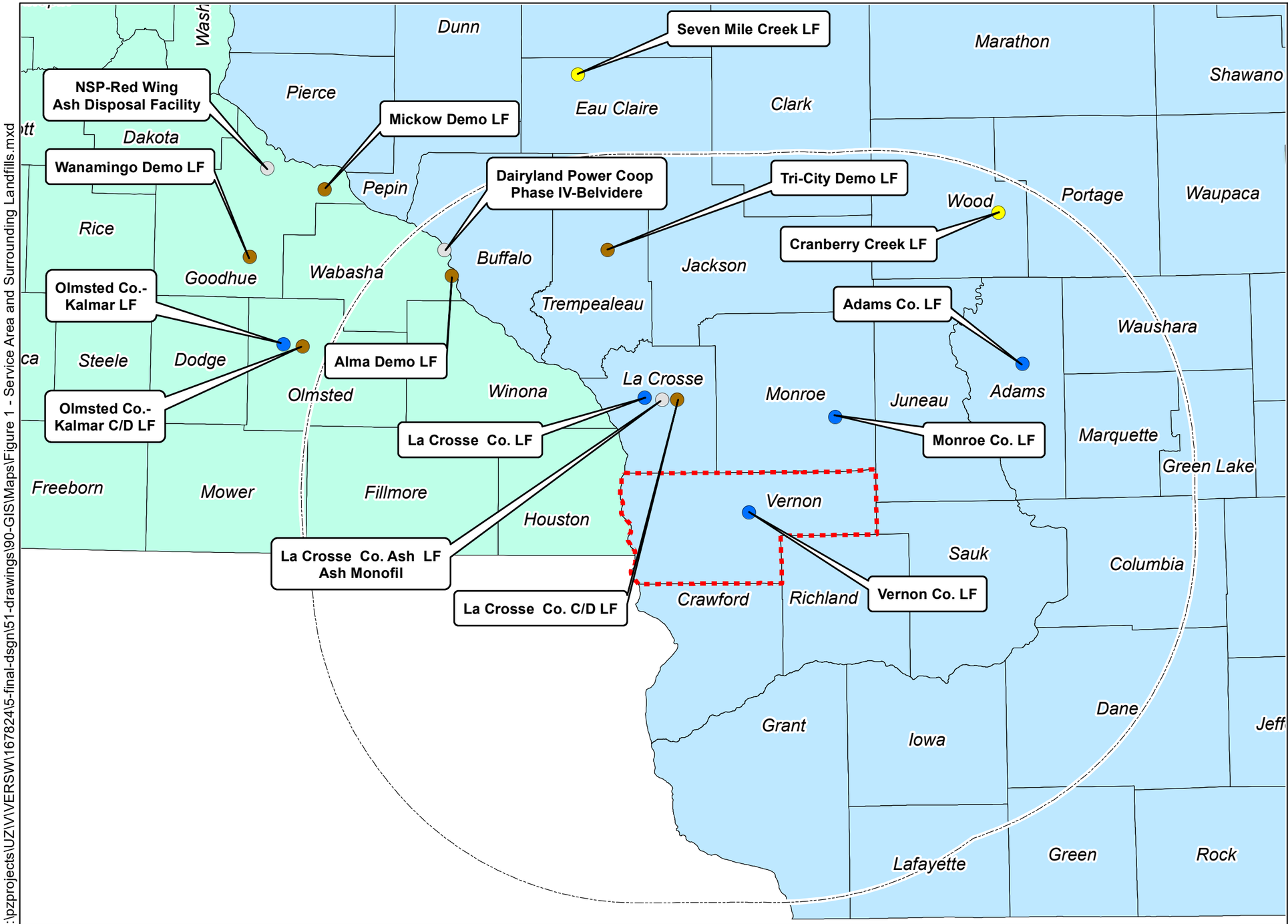
KEY

Category 1: Municipal Waste
Category 2: Utility Ash/Sludges
Category 3: Pulp/Papermill Mfg waste
Category 4: Foundry Waste
Category 5: POTW Sludges
Category 6: All other SW (not HW)
Category 19: Fee Exempt waste used for dikes, berms, etc
Category 20: Energy Recovery Incinerator Ash
Category 21: High Volume Industrial used for daily cover,etc
Category 22: Shredder Fluff used for daily cover
Category 23: Treated Contaminated Soil used for daily cover
Category 24: Exempt Unusable Paper Making Materials
Category 25: Construction & Demolition (C&D) Waste
Category 26: Sediments Contaminated with PCBs
Category 27: Waste Generated by a Non-Profit Org
Category 28: Waste Generated by Natural Disaster
Category 29: Waste Removed at Request of DNR to Mitigate Potential Env Impacts
Category 30: MRF Residuals – 10% cap
Category 31: MFR Residuals – 30% cap

Appendix F

Visuals

Document Path: Z:\pzprojects\UZ\VVERSW167824\5-final-dsgn\51-drawings\90-GIS\Maps\Figure 1 - Service Area and Surrounding Landfills.mxd



Legend

- Wisconsin Counties
- Minnesota Counties
- 60 Mile ROI
- Service Area Boundary

Landfills

Facility Type

- Ash Landfill
- C/D Landfill
- Private Landfill
- Public Landfill

N

W E

S

0 10 20 40 Miles

Source:
La Crosse County,MNDNR and WIDNR.
Projection:
La Crosse County Coordinates, Feet
Map by:
rjh

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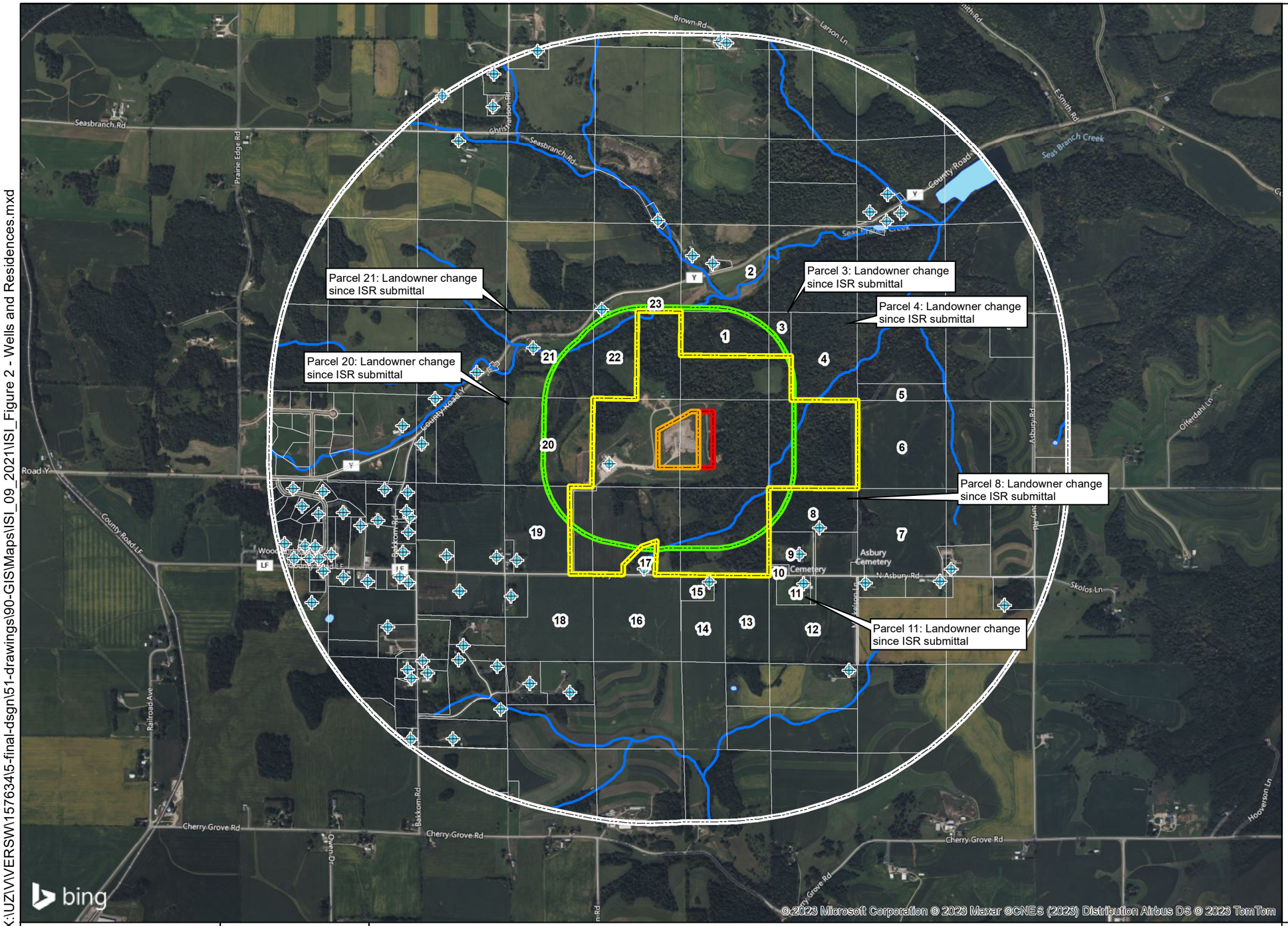
DATE: 07/25/2023

FEASIBILITY REPORT
VERNON COUNTY LANDFILL
(WIDNR LICENSE NO.3268)

Service Area and Surrounding Landfills

Figure 1

Document Path: X:\UZI\VERSW\1576345-final-dsgn\51-drawings\90-GIS\Maps\ISI_09_2021\ISI_Figure 2 - Wells and Residences.mxd



Legend

- Private Wells
- Landfill Property Boundary
- 1 Mile Buffer
- 1200 Foot Buffer
- Parcels within 1 Mile
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Landfill Expansion
- Waterbodies
- Streams

N

W E

S

0 750 1,500 3,000 Feet

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
RRH

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09/05/2023

FEASIBILITY REPORT VERNON COUNTY LANDFILL (WIDNR LICENSE NO.3268)

Residences and Private Wells Within 1 Mile of Proposed Landfill Expansion

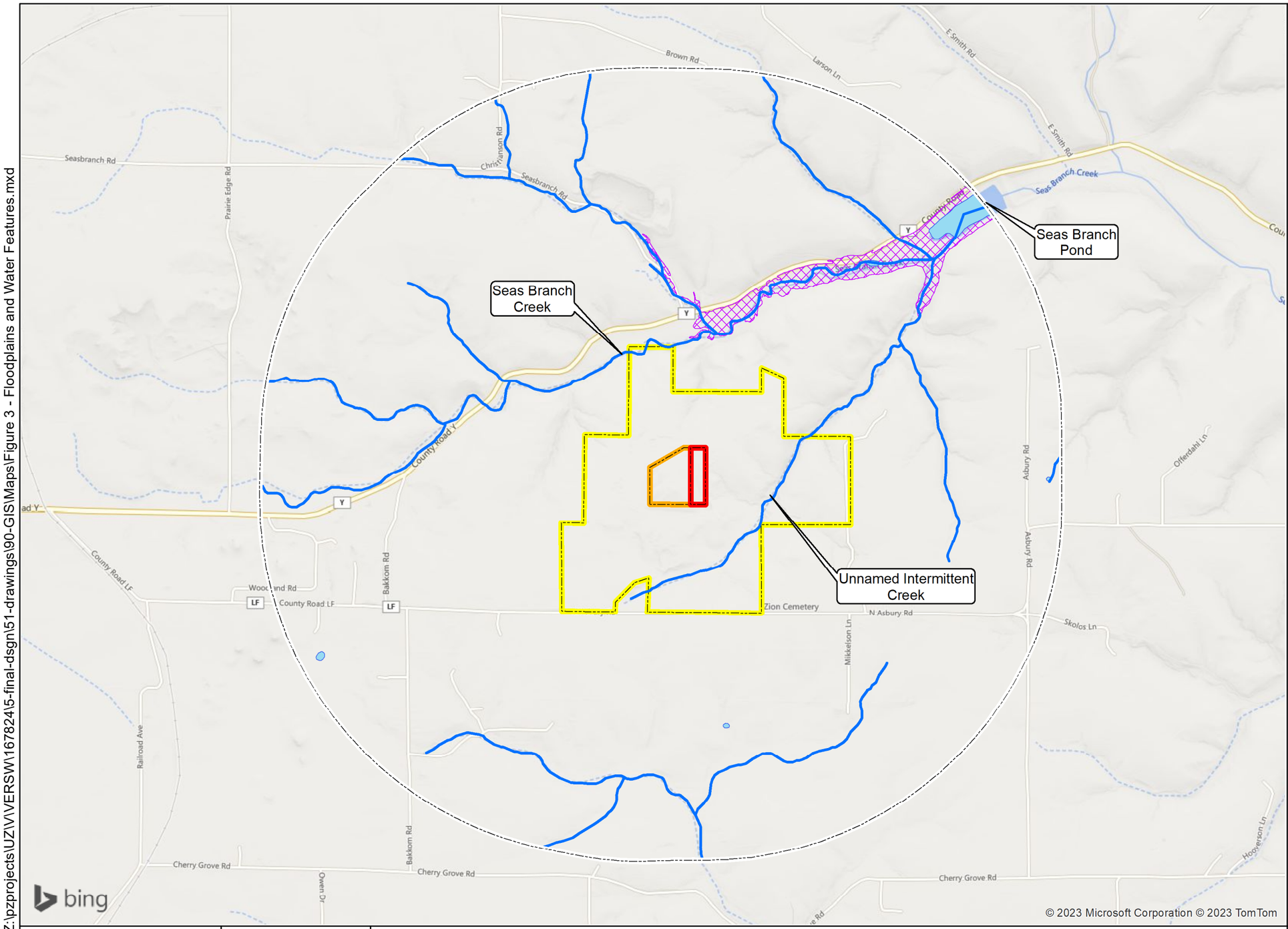
Figure 2

Table 1

Adjacent Land Owners

Map ID	Parcel ID	Owner	Owner 2	Postal Address	Site Addess
1	036-00411-0000	RANDY D & KAREN M CRUME		E8284 SEAS BRANCH RD VIROQUA WI 54665-8217	
2	036-00393-0000	RANDY D & KAREN M CRUME		E8284 SEAS BRANCH RD VIROQUA WI 54665-8217	E8284 SEAS BRANCH RD
3	036-00410-0000	RANDY CRUME	KAREN CRUME	E8284 SEASBRANCH RD VIROQUA WI 54665	
4	036-00408-0000	GERALD S HANOSKI TRUST		N1889 HAGEN RD LACROSSE WI 54601	
5	036-00379-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD COON VALLEY WI 54623	
6	036-00381-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD COON VALLEY WI 54623	
7	036-00674-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD COON VALLEY WI 54623	
8	036-00638-0000	STEVEN & DEBRA CLARK		214 N WASHINGTON AVE VIROQUA WI 54665	E8454 N ASBURY RD
9	036-00637-0000	WISCONSIN RSA #8	LIMITED PARTNERSHIP	8410 W BRYN MAWR AVE CHICAGO IL 60631	E8445 N ASBURY RD
10	036-00635-0000	ZION CHURCH		E8414 N ASBURY RD VIROQUA WI 54665	
11	036-00645-0000	JEROME BUTERA TRUST	SHARON BUTERA TRUST	E8449 N ASBURY RD VIROQUA WI 54665	E8449 N ASBURY RD
12	036-00644-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD COON VALLEY WI 54623	
13	036-00642-0000	K & M HERLITZKE FARMS LLC		W2818 EVANS DWYER RD COON VALLEY WI 54623	
14	036-00643-0000	JOHN & LINDA KIELER REVOCABLE TRUST		748 COUNTY RD Z HAZEL GREEN WI 53811	
15	036-00641-0000	ROBERT J & TAMMY L MENNE		E8327 N ASBURY RD VIROQUA WI 54665	E8327 N ASBURY RD
16	036-00652-0000	JOHN & LINDA KIELER REVOCABLE TRUST		748 COUNTY RD Z HAZEL GREEN WI 53811	
17	036-00647-0000	CHAD B WILLIAMS		E7541 COUNTY RD SS VIROQUA WI 54665	E8263 N ASBURY RD
18	036-00650-0000	JOHN & LINDA KIELER REVOCABLE TRUST		748 COUNTY RD Z HAZEL GREEN WI 53811	
19	036-00649-0001	WAYNE K KRUIZENGA	JULIE KRUIZENGA	E8107 COUNTY RD LF VIROQUA WI 54665-8166	E8108 COUNTY RD LF
20	036-00406-0000	RODNEY WIEBE	DEB WIEBE	E8137 COUNTY RD Y VIROQUA WI 54665	
21	036-00405-0000	RODNEY WIEBE	DEB WIEBE	E8137 COUNTY RD Y VIROQUA WI 54665	E8137 COUNTY RD Y
22	036-00404-0000	GRACE ACRES LLC		E8219 COUNTY RD Y VIROQUA WI 54665	
23	036-00402-0000	GRACE ACRES LLC		E8219 COUNTY RD Y VIROQUA WI 54665	E8219 COUNTY RD Y

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Legend

- Landfill Property Boundary
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Landfill Expansion
- 1 Mile Buffer
- Streams
- Waterbodies

Flood Zone

- 1% Chance Annual Flood Hazard

N

W E

S

0 750 1,500 3,000 Feet

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
rjh

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Document Path: Z:\pzprojects\UZ\VV\VERSW167824\5-final-dsgn\51-drawings\90-GIS\Maps\Figure 3 - Floodplains and Water Features.mxd

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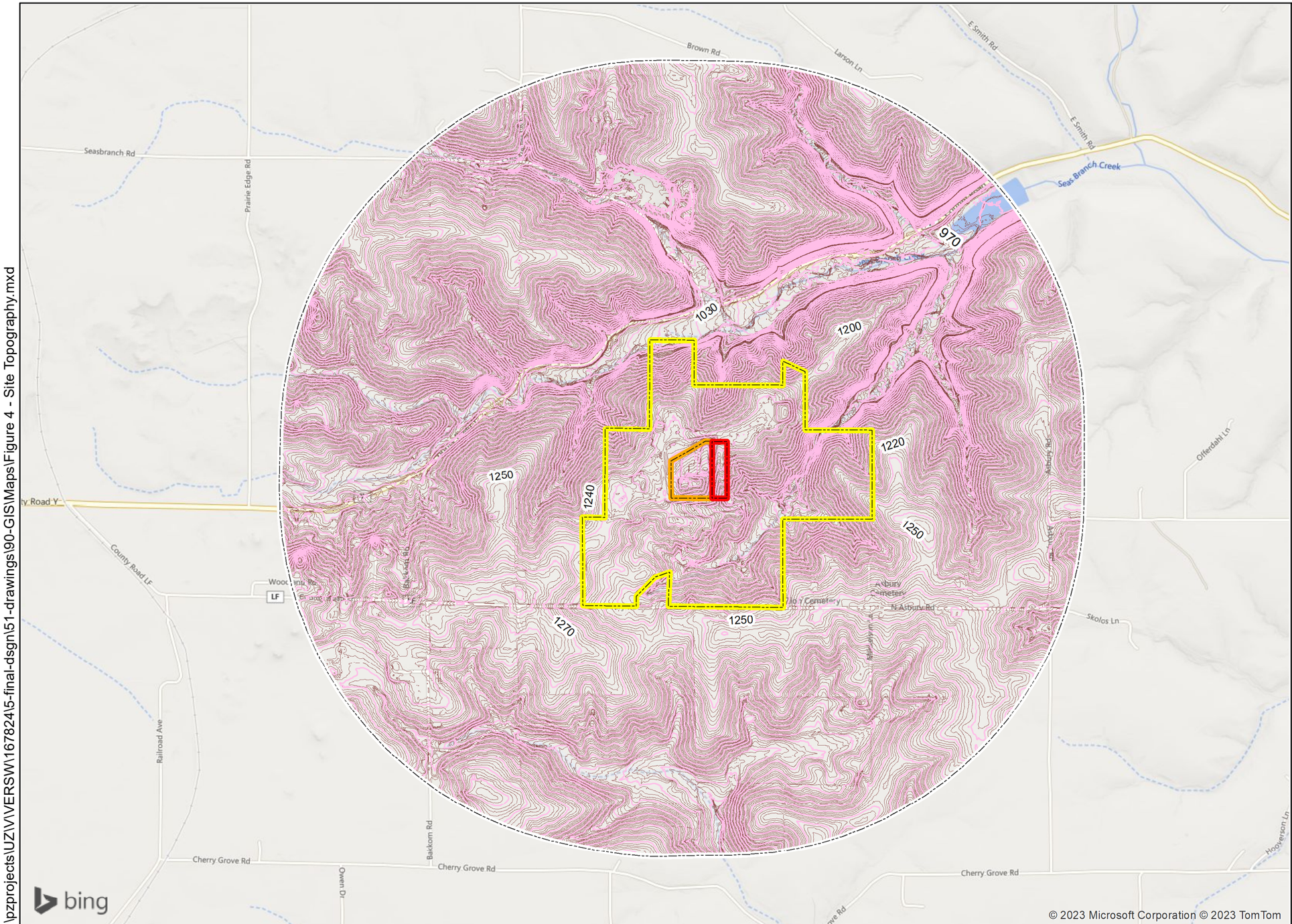
PROJECT: VERSW167824

DATE: 07/25/2023

FEASIBILITY REPORT VERNON COUNTY LANDFILL (WIDNR LICENSE NO.3268)

Floodplains and Water Features Within 1 Mile of Proposed Landfill Expansion

Figure 3



Legend

- 1 Mile Buffer
- Approximate Limits of Proposed Horizontal Limits of Expansion
- Active Landfill Limits
- Landfill Property Boundary

Topography

- Major Contours(10' Intervals)
- Minor Contours (2' Intervals)

N
W E
S

0 750 1,500 3,000
Feet

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
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Document Path: Z:\pzprojects\UZ\V\VERSW\167824\5-final-dsgn\51-drawings\90-GIS\Maps\Figure 4 - Site Topography.mxd

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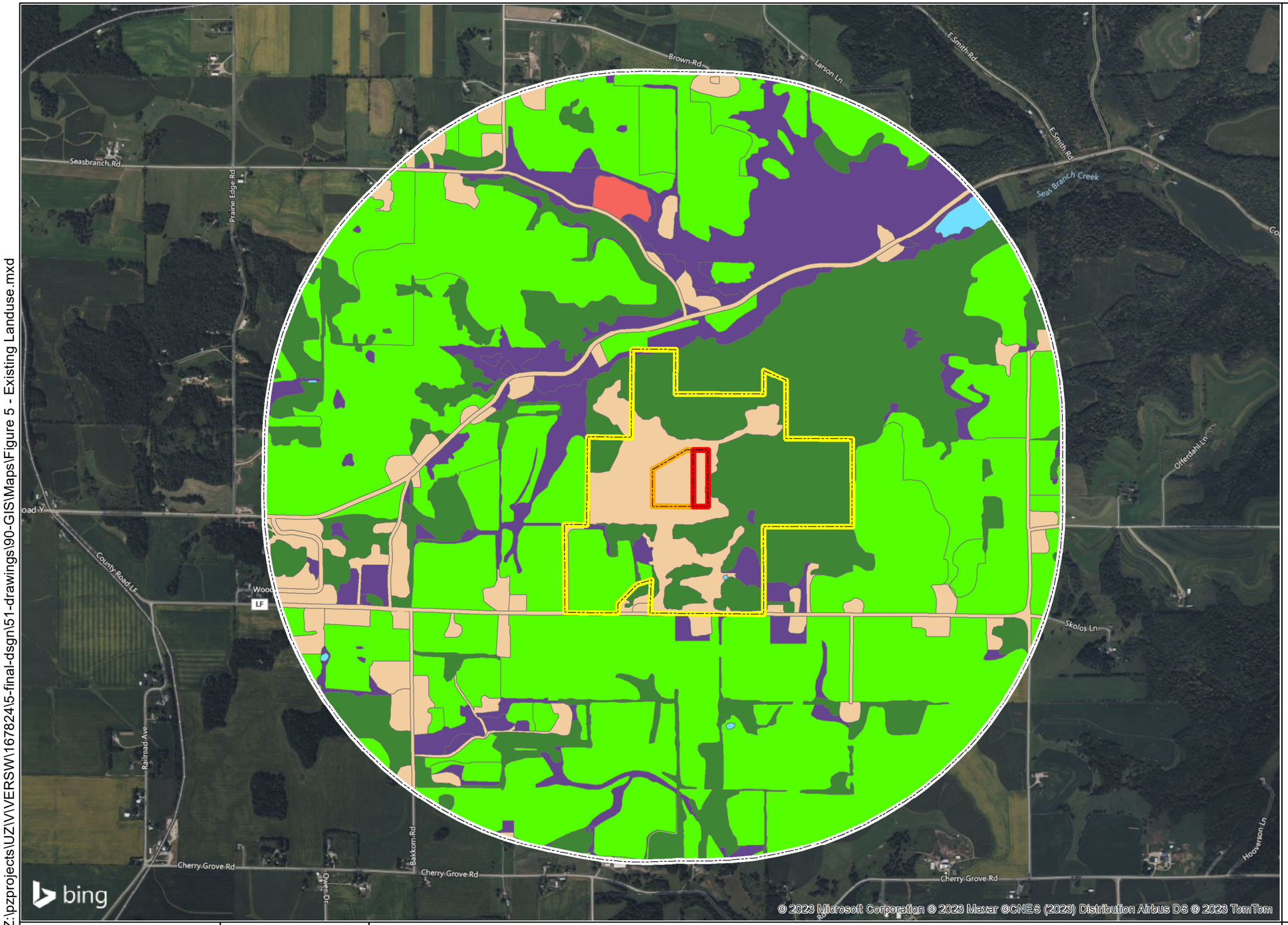
PROJECT:
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07/25/2023

FEASIBILITY REPORT VERNON COUNTY LANDFILL (WIDNR LICENSE NO.3268)

Topography within 1 Mile of Horizontal Expansion

Figure 4



Legend

- 1 Mile Buffer
- Landfill Property Boundary
- Approximate Limits of Proposed Horizontal Landfill Expansion
- Active Landfill Limits

Landuse

- Agriculture
- Barren
- Developed
- Forest
- Grassland
- Open Water

N

W E

S

0 750 1,500 3,000 Feet

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
rjh

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Document Path: Z:\pzprojects\UZ\VVERSW167824\5-final-dsgn\51-drawings\90-GIS\Maps\Figure 5 - Existing Landuse.mxd

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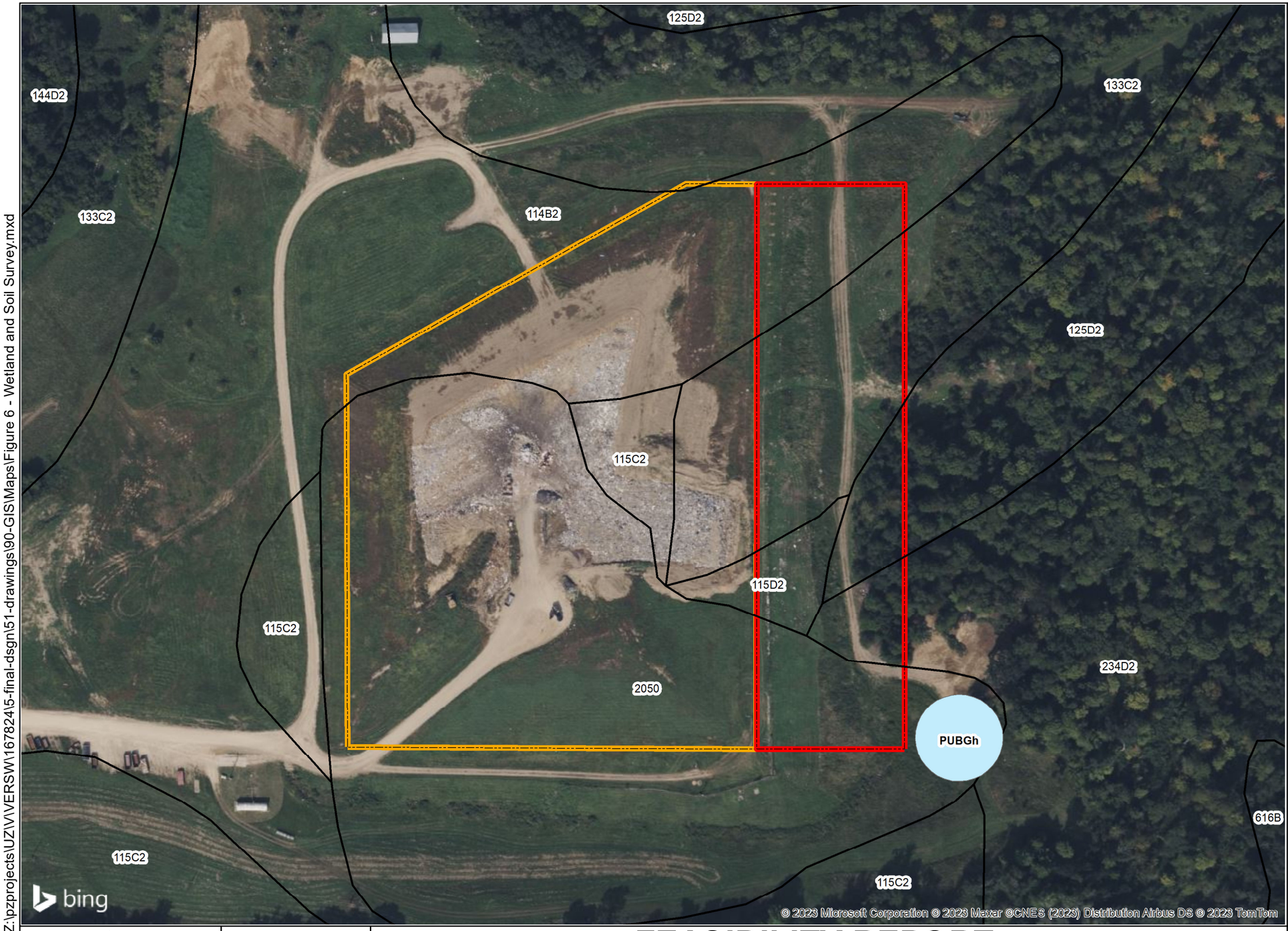
PROJECT: VERSW167824

DATE: 07/25/2023

FEASIBILITY REPORT VERNON COUNTY LANDFILL (WIDNR LICENSE NO.3268)

Existing Landuse Within 1 Mile of Proposed Landfill Expansion

Figure 5



Legend

Wetland Boundary

Soil Survey Boundary

Approximate Limits of Proposed Eastern Expansion

Active Landfill Limits

Map Unit Symbol	Soil Description
114B2	Mt. Carroll silt loam, 2 to 6 percent slopes, moderately eroded
115C2	Seaton silt loam, driftless ridge, 6 to 12 percent slopes, moderately eroded
115D2	Seaton silt loam, driftless ridge, 12 to 20 percent slopes, moderately eroded
125D2	Pepin silt loam, 12 to 20 percent slopes, moderately eroded
133C2	Valton silt loam, 6 to 12 percent slopes, moderately eroded
144D2	New glarus silt loam, deep, 12 to 20 percent slopes, moderately eroded
234D2	Basco silt loam, 12 to 20 percent slopes, moderately eroded
616B	Chaseburg silt loam, 1 to 4 percent slopes, occasionally flooded
2050	Landfill

Map Unit Symbol	Wetland Type Description
PUBGh	Palustrine, unconsolidated bottom, intermittently exposed, diked/impounded.

N

W E

S

0 75 150 300 Feet

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
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Document Path: Z:\pzprojects\UZ\VV\VERSW167824\5-final-dsgn\51-drawings\90-GIS\Maps\Figure 6 - Wetland and Soil Survey.mxd

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DATE: 07/25/2023

FEASIBILITY REPORT VERNON COUNTY LANDFILL (WIDNR LICENSE NO.3268)

Wetland Inventory and Soil Survey

Figure 6

Appendix G

Wetland Evaluation

G-1 – Wetland Evaluation Memo

G-2 – Vernon County Surface Water Data View Map

G-1 – Wetland Evaluation Memo

Building a Better World for All of Us®

TECHNICAL MEMORANDUM

TO: Stacie Sanborn, Vernon County Solid Waste Department

FROM: Renee Wilde, PWS, CFM - SEH Wetland Scientist
WDNR Assured Wetland Delineator

DATE: June 4, 2021

RE: 2021 Expansion Planning – Evaluation for Wetlands
SEH No. VERSW 157634 14.00

This Memorandum summarizes SEH's site reconnaissance for the proposed expansion of the landfill area at the Vernon County Solid Waste and Recycling Facility, located at S3705 County Road LF, Viroqua, WI. SEH reviewed the natural vegetation and landscape conditions in the landfill expansion area to determine if any areas met the technical criteria of a wetland, as set forth in the U.S. Army Corps of Engineers *Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to Wetland Delineation Manual: Midwest Region* (USACE 2010) on May 4, 2021. The field reconnaissance was completed by Renee Wilde, PWS, CFM, Wisconsin Department of Natural Resources (WDNR) Assured Wetland Delineator.

The site is located in the southwest 1/4 of Section 15 in Township 13 North, Range 4 West in the Town of Viroqua, Vernon County, Wisconsin (**Figure 1**). In general, the property is located north of County Road LF, east of Bakkom Road, south of County Road Y, and west of Asbury Road.

The approximately 10.4-acre survey area is located north of the existing landfill footprint, as shown on **Figure 2**. The landfill facility is located along a ridgeline within the Western Coulee and Ridges ecological landscape. The landscape within the project area drains north towards the Seas Branch, which flows east to the West Fork of the Kickapoo River. The project site is approximately 160-180 feet higher in elevation than the waterway. In general, the current landfill operation and proposed expansion area sits high in the landscape. Representative photographs (**Appendix A**) of the area investigated are attached.

All three of the following criteria must be present in order to make a positive wetland determination, which are as follows: 1) Greater than 50% dominance of hydrophytic plant species, 2) Presence of hydric soil, and 3) Indicators of wetland hydrology observed. To document current site conditions, sample point data was collected and recorded on Wetland Determination Data Forms (**Appendix B**).

The WDNR Wisconsin Wetlands Inventory (WWI) does not identify wetlands within the survey limits, nor within the general vicinity. Soils within the project area are classified as "Valton silt loam," "Pepin silt loam," and "Mt. Carroll silt loam" by the Natural Resource Conservation Service (NRCS). These types of soils are classified as non-hydric, which is consistent with observations made during the site visit. Four "wet spots" were identified by the NRCS as areas that have the potential to be wetland (**Figure 2**). These areas were investigated to determine the presence or absence of wetlands.

A potential "wet spot" was identified by the NRCS in the southwest portion of the site. At this location, the area is a transition zone between an open field and forested, and the ground elevation slopes towards the northwest.

Sample point data (SP1U) was collected to document site conditions. Vegetation was dominated by Kentucky bluegrass (*Poa pratensis* – FAC), Canadian goldenrod (*Solidago canadensis* – FACU), and Allegheny blackberry (*Rhubus allegheniensis* – FACU) in the herbaceous stratum, choke cherry (*Prunus virginiana* – FACU) in the shrub stratum, and black cherry and ash-leaf maple/boxelder (*Acer negundo* – FAC) in the tree stratum. Soils at SP1U are composed of 6 inches of dark yellowish brown (10YR 3/4) silty clay loam, underlain by 4 inches of dark yellowish brown (10YR 4/4) loam. This was followed by 4 inches of yellowish brown (10YR 5/4) loam with 5% redoximorphic concentrations (10YR 4/4), and at least 8 inches of yellowish brown (10YR 5/4) clay loam with 20% redoximorphic concentrations (10YR 4/4). The soil profile does not meet the technical criteria for hydric soils. No primary or secondary hydrology indicators were present. None of the three wetland criteria were met, therefore the area is non-wetland.

Within the forested area in the northwest portion of the site, multiple NRCS “wet spots” were mapped. The forested appears to have been selectively logged in the past. There are multiple old logging roads in this area that have overgrown with grasses. It is anticipated that these grassed roads appear “greener” on aerial photographs and is likely the reason potential “wet spots” were marked here. Topography in the forest slopes relatively steeply towards the east and northeast. Sample point data (SP2U) was collected in the vicinity of the marked “wet spots.” Vegetation within the forest was dominated by Spotted crane’s bill/wild geranium (Geranium maculatum – FACU), Kentucky bluegrass, Pennsylvania sedge (*Carex pensylvanica* – UPL), Virginia spring beauty (*Claytonia virginica* – FACU), creeping buttercup (*Ranunculus repens* – FAC), hooded blue violet (*Viola sororia* – FAC), and Shawnee-salad/Virginia waterleaf (*Hydrophyllum virginianum* – FAC) in the herbaceous stratum; the shrub stratum was dominated by American elm (*Ulmus americana* – FACW) and the tree stratum was dominated by American elm, red maple (*Acer rubrum* – FAC), and northern red oak (*Quercus rubra* – FACU). Soils at SP2U are composed of 3 inches of dark brown (10YR 3/3) silt loam, underlain by 8 inches of dark yellowish brown (10YR 3/4) silt loam. This was followed by 4 inches of dark yellowish brown (10YR 3/6) silt loam, and at least 7 inches of dark yellowish brown (10YR 4/4) silt loam. The soil profile does not meet the technical criteria for hydric soils. No primary or secondary hydrology indicators were present. Although the hydrophytic vegetation criteria was met, hydric soils and hydrology was not present, therefore the area does not meet wetland criteria.

The field visit was conducted under temperature that were normal and precipitation conditions that were drier than normal as compared to the historical average for the region according to USDA Field Office Climate Data WETS tables from the Viroqua, WI Station in Vernon County (**Appendix C**). The drier than normal conditions did not hinder the investigation for wetlands.

From this field visit, it was concluded that no areas meeting the technical criteria for wetland are present within the area investigated.

Thank you for the opportunity to provide wetland services to the Vernon County Solid Waste Department. Short Elliott Hendrickson Inc. (SEH®) is pleased to provide you with this information for your records. If you have any questions, please contact me directly at 715-720-6263 or via e-mail at rwilde@sehinc.com.

Attachments
Figure 1 – Site Location & Topographic Map
Figure 2 – Wisconsin Wetland Inventory & Vernon County Soil Survey

Appendix A – Site Photographs
Appendix B – Wetland Determination Data Forms
Appendix C – Climate Summary Data



Path: C:\Users\mfalk\OneDrive - Short Elliott Hendrickson Inc\Desktop\2021 Projects\Vernon County Landfill - VERSW 157634\1 - Location and Topography.mxd

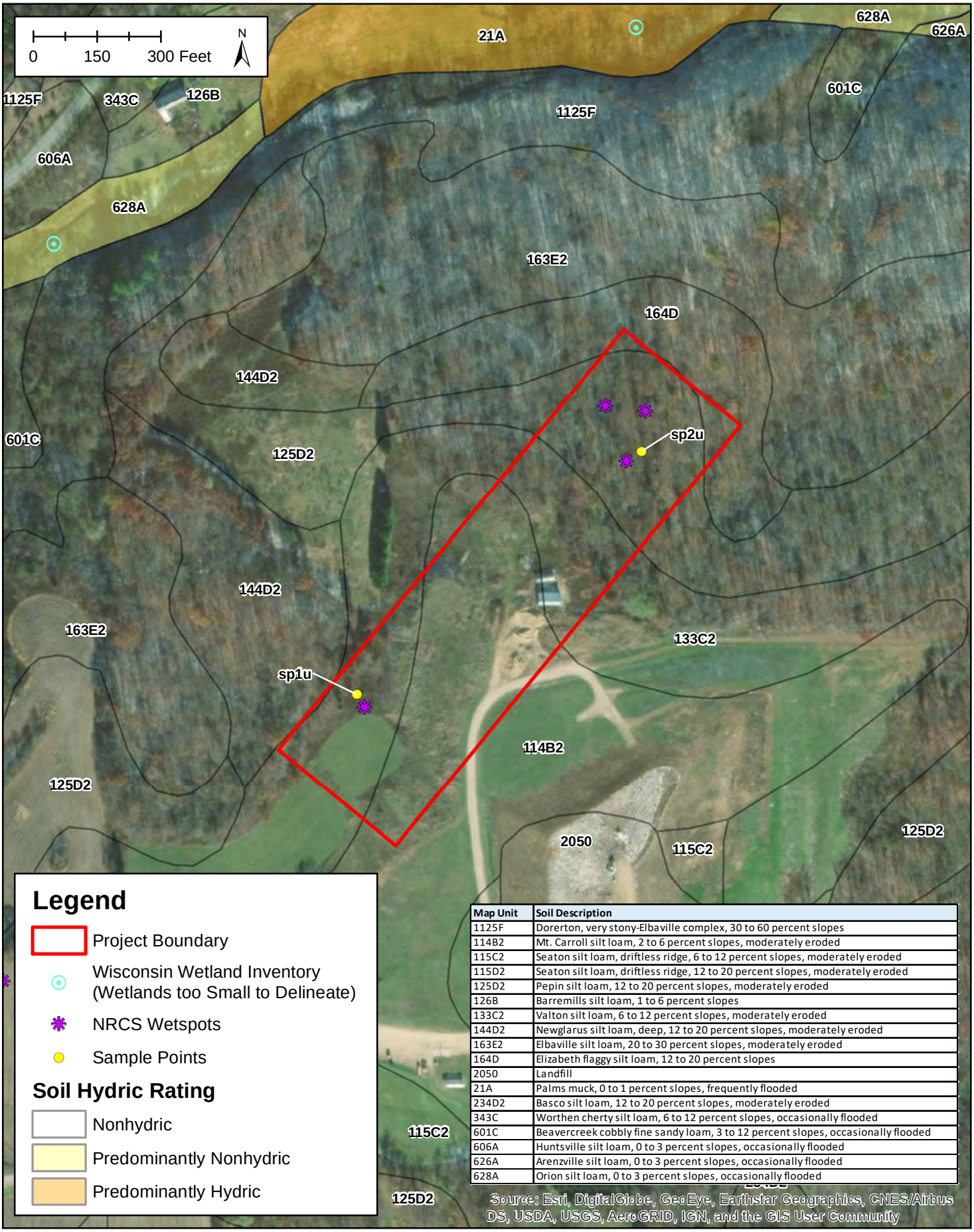
SEH
10 NORTH BRIDGE STREET
CHIPPEWA FALLS, WI 54729-2550
PHONE: (715) 720-6200
FAX: (888) 908-8166
TF: (800) 472-5881
www.sehinc.com

Project: VERSW 157634
Print Date: 6/1/2021

Map by: mfalk
Prj: WISCRS, Vernon Co (ft)
Source: WDNR, USGS, Vernon County

Site Location and Topographic Map
2021 Expansion Planning
Town of Viroqua, Vernon County, WI

Figure 1



Map Unit	Soil Description
1125F	Dorerton, very stony-Elbaville complex, 30 to 60 percent slopes
114B2	Mt. Carroll silt loam, 2 to 6 percent slopes, moderately eroded
115C2	Seaton silt loam, driftless ridge, 6 to 12 percent slopes, moderately eroded
115D2	Seaton silt loam, driftless ridge, 12 to 20 percent slopes, moderately eroded
125D2	Pepin silt loam, 12 to 20 percent slopes, moderately eroded
126B	Barremills silt loam, 1 to 6 percent slopes
133C2	Valton silt loam, 6 to 12 percent slopes, moderately eroded
144D2	Newglarus silt loam, deep, 12 to 20 percent slopes, moderately eroded
163E2	Elbaville silt loam, 20 to 30 percent slopes, moderately eroded
164D	Elizabeth flaggy silt loam, 12 to 20 percent slopes
2050	Landfill
21A	Palms muck, 0 to 1 percent slopes, frequently flooded
234D2	Basco silt loam, 12 to 20 percent slopes, moderately eroded
343C	Worthen cherty silt loam, 6 to 12 percent slopes, occasionally flooded
601C	Beavercreek cobbly fine sandy loam, 3 to 12 percent slopes, occasionally flooded
606A	Huntsville silt loam, 0 to 3 percent slopes, occasionally flooded
626A	Arenzville silt loam, 0 to 3 percent slopes, occasionally flooded
628A	Orion silt loam, 0 to 3 percent slopes, occasionally flooded

Path: C:\Users\mfalk\OneDrive - Short Elliott Hendrickson Inc\Desktop\2021 Projects\Vernon County Landfill - VERSW 157634\2 - WWI + Soil Survey.mxd

SEH
10 NORTH BRIDGE STREET
CHIPPEWA FALLS, WI 54729-2550
PHONE: (715) 720-6200
FAX: (888) 908-8166
TF: (800) 472-5881
www.sehinc.com

Project: VERSW 157634
Print Date: 6/1/2021

Map by: mfalk
Prj: WISCRS, Vernon Co (ft)
Aerial Year: 2020
Source: WDNR, USDA

Wisconsin Wetland Inventory and Vernon County Soil Survey
2021 Expansion Planning
Town of Viroqua, Vernon County, WI

Figure 2



Photo 1 Upland field dominated by dandelion and clover in the southwest corner of the survey limits, facing southwest from the northern edge of the field



Photo 2 Northern edge of upland field (same as above photo), facing northwest



Photo 3 Transition zone between shrub area and forest located north of the upland field (see Photo 1), facing north towards Sample Point 1U



Photo 4 Upland area adjacent to Sample Point 1U; area dominated by species of Kentucky bluegrass, Canada goldenrod, blackberry, and raspberry



Photo 5 Old logging road within woods that appears to have been selectively cut in the past. In the northern portion of the site, photo taken facing northeast and approximately 50 feet inside the tree line. Trail slopes downward, towards the northeast.



Photo 6 Old logging road overgrown with grasses; the road slopes towards the northeast



Photo 7 Intersection of two logging roads within the woods, facing south from the vicinity of Sample Point 2U. The topography slopes towards the northeast, with the landfill seen in the background.



Photo 8 Typical understory found within the forested area. The forest is high in the landscape and vegetation is dominated by upland species.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: 2021 Expansion Planning | City/County: Vernon County | Sampling Date: May 4, 2021

Applicant/Owner: Vernon County Solid Waste Department | State: Wisconsin | Sampling Point: SP1U

Investigator(s): Renee Wilde, SEH | Section, Township, Range: SW 1/4 Sec 15, T13N R4W

Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Convex

Slope (%): 15% | Lat: 43° 35' 55.8" N | Long: 90° 50' 32.1" W | Datum: Vernon County Coordinates

Soil Map Unit Name: Valton silt loam, 6-12% slopes, moderately eroded (133C2) | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed?

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? N	
Hydric soil present? N	**Is the sampled area within a wetland?** N
Indicators of wetland hydrology present? N	If yes, optional wetland site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

Per National Weather Service precipitation data and WETS table, climate conditions are "drier than normal"

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' Radius)		Absolute % Cover	Dominant Species	Indicator Status
1	*Prunus virginiana* -- *Choke Cherry*	15	Y	FACU
2	*Acer negundo* -- *Ash-Leaf Maple*	5	Y	FAC
3	--			
4	--			
5	--			
		20	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' Radius)				
1	*Prunus virginiana* -- *Choke Cherry*	15	Y	FACU
2	*Acer negundo* -- *Ash-Leaf Maple*	5	N	FAC
3	*Rubus allegheniensis* -- *Allegheny Blackberry*	5	N	FACU
4	*Lonicera tatarica* -- *Twinsisters*	5	N	FACU
5	--			
		30	= Total Cover	
Herb stratum (Plot size: 5' Radius)				
1	*Poa pratensis* -- *Kentucky Blue Grass*	40	Y	FAC
2	*Solidago canadensis* -- *Canadian Goldenrod*	30	Y	FACU
3	*Rubus allegheniensis* -- *Allegheny Blackberry*	15	N	FACU
4	*Taraxacum officinale* -- *Common Dandelion*	10	N	FACU
5	--			
6	--			
7	--			
8	--			
9	--			
10	--			
		95	= Total Cover	
Woody vine stratum (Plot size: 30' Radius)				
1	--			
2	--			
		0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 5 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 40.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	95	x 4 =	380
UPL species	0	x 5 =	0
Column totals	145 (A)		530 (B)

Prevalence Index = B/A = 3.66

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- ____ Dominance test is >50%
- ____ Prevalence index is ≤3.0*
- ____ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

Note: This data sheet has been adapted to use the 2018 National Wetland Plant List:
U.S. Army Corps of Engineers 2018. National Wetland Plant List, version 3.4

SOIL **Sampling Point:** SP1U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-6	10YR 3/4	100					Silty Clay Loam	
6-10	10YR 4/4	100					Loam	
10-14	10YR 5/4	95	10YR 4/4	5	C	M	Loam	
14-22+	10YR 5/4	80	10YR 4/4	20	C	M	Clay Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: 2021 Expansion Planning | City/County: Vernon County | Sampling Date: May 4, 2021

Applicant/Owner: Vernon County Solid Waste Department | State: Wisconsin | Sampling Point: SP2U

Investigator(s): Renee Wilde, SEH | Section, Township, Range: SW 1/4 Sec 15, T13N R4W

Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Convex

Slope (%): 25% | Lat: 43° 36' 02.0" N | Long: 90° 50' 23.1" W | Datum: Vernon County Coordinates

Soil Map Unit Name: Pepin silt loam, 12-20% slopes, moderately eroded (125D2) | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed?

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y
Hydric soil present?	N
Indicators of wetland hydrology present?	N

Is the sampled area within a wetland? N

If yes, optional wetland site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Per National Weather Service precipitation data and WETS table, climate conditions are "drier than normal"

VEGETATION -- Use scientific names of plants.

	Tree Stratum (Plot size: 30' Radius)		Absolute % Cover	Dominant Species	Indicator Status
1	*Ulmus americana*	-- *American Elm*	25	Y	FACW
2	*Acer rubrum*	-- *Red Maple*	20	Y	FAC
3	*Quercus rubra*	-- *Northern Red Oak*	15	Y	FACU
4	*Fraxinus pennsylvanica*	-- *Green Ash*	10	N	FACW
5		--			
			70	= Total Cover	
	Sapling/Shrub stratum (Plot size: 15' Radius)				
1	*Ulmus americana*	-- *American Elm*	10	Y	FACW
2		--			
3		--			
4		--			
5		--			
			10	= Total Cover	
	Herb stratum (Plot size: 5' Radius)				
1	*Geranium maculatum*	-- *Spotted Crane's-Bill*	20	Y	FACU
2	*Poa pratensis*	-- *Kentucky Blue Grass*	15	Y	FAC
3	*Carex pensylvanica*	-- *Pennsylvania Sedge*	15	Y	UPL
4	*Claytonia virginica*	-- *Virginia Springbeauty*	10	Y	FACU
5	*Ranunculus repens*	-- *Creeping Buttercup*	10	Y	FAC
6	*Viola sororia*	-- *Hooded Blue Violet*	10	Y	FAC
7	*Hydrophyllum virginianum*	-- *Shawnee-Salad*	10	Y	FAC
8	*Ribes cynosbati*	-- *Eastern Prickly Goosebe*	5	N	FAC
9	*Anemone virginiana*	-- *Tall Thimbleweed*	5	N	FACU
10	*Trillium cernuum*	-- *Whip-Poor-Will-Flower*	5	N	FAC
			105	= Total Cover	
	Woody vine stratum (Plot size: 30' Radius)				
1		--			
2		--			
			0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across all Strata: 11 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 63.64% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	45	x 2 =	90
FAC species	75	x 3 =	225
FACU species	50	x 4 =	200
UPL species	15	x 5 =	75
Column totals	185 (A)		590 (B)

Prevalence Index = B/A = 3.19

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- ____ Prevalence index is ≤3.0*
- ____ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Additional herbaceous species observed: Alliaria petiolata, Thalictrum dioicum, Sanguinaria canadensis

Note: This data sheet has been adapted to use the 2018 National Wetland Plant List:
U.S. Army Corps of Engineers 2018. National Wetland Plant List, version 3.4

SOIL

Sampling Point: SP2U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-3	10YR 3/3	100					Silt Loam	
3-11	10YR 3/4	100					Silt Loam	
11-15	10YR 3/6	100					Silt Loam	
15-22+	10YR 4/4	100					Silt Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
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- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Field Visit Date: May 4, 2021

		Long-term rainfall records							
	Month	**3 yrs. in 10 less than**	**Normal**	**3 yrs. in 10 more than**	**Rain fall**	**Condition: dry, wet, normal**	**Condition value**	**Month weight value**	**Product of previous two columns**
1st prior month*	April	2.56	3.72	4.44	0.62	1	Dry	**3**	3
2nd prior month*	March	0.92	1.77	2.16	1.86	2	Normal	**2**	4
3rd prior month*	February	0.51	1.02	1.23	0.79	2	Normal	**1**	2
								Sum	9

* Compared to field date

**Monthly data prior to field date

"Drier than Normal"

Note: If sum is

6-9	then prior period has been drier than normal
10-14	then prior period has been normal
15-18	then prior period has been wetter than normal

Condition va	=1
Dry	=2
Normal	=3
Wet	

Monthly Data between Specific Months
VIROQUA (WI)
USC00478827

To sort multiple columns, hold SHIFT while clicking on the columns.

Monthly Sum/Averages

Date	Precipitation (in)	Snowfall (in)	Avg. Max Temp (°F)	Avg. Min Temp (°F)	Avg. Mean Temp (°F)
Feb-2021	0.79	9.0	18.0	1.1	9.6
Mar-2021	1.86	3.4	47.5	28.4	38.0
Apr-2021	0.62	0.0	55.4	35.3	45.3
May-2021	M	M	M	M	M
Sum:	3.27	12.4			
Count:	3	3	3	3	3
Average:	1.09	4.1	40.3	21.6	31.0
Median:	0.79	3.4	47.5	28.4	38.0
Low Value:	0.62	0.0	18.0	1.1	9.6
High Value:	1.86	9.0	55.4	35.3	45.3

M = Missing

T = Trace

Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 5/6/2021 3:49:22 PM CDT

WETS Station: VIROQUA, WI

Requested years: 1971 - 2020

Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	23.6	5.5	14.6	0.96	0.6	1.16	3	10.9
Feb	28.9	9.7	19.3	1.02	0.51	1.23	3	8.8
Mar	41.3	21.9	31.6	1.77	0.92	2.16	4	6.5
Apr	56.1	33.4	44.8	3.72	2.56	4.44	7	3.1
May	67.8	44.9	56.4	4.16	2.76	4.98	8	0
Jun	76.7	54.6	65.7	4.79	3.05	5.78	7	0
Jul	80.8	59	69.9	4.55	3.01	5.46	7	0
Aug	78.6	56.9	67.7	4.6	2.65	5.6	7	0
Sep	70.7	48.4	59.5	3.73	2.02	4.56	6	0
Oct	57.9	36.7	47.3	2.5	1.64	3.01	5	0.4
Nov	42	24.8	33.4	1.95	1.09	2.37	4	4.1
Dec	28.2	12.1	20.1	1.54	0.74	1.88	4	10.2
Annual:					31.23	39.5		
Average	54.4	34	44.2	-	-	-	-	-
Total	-	-	-	35.3			65	44.1

GROWING SEASON DATES

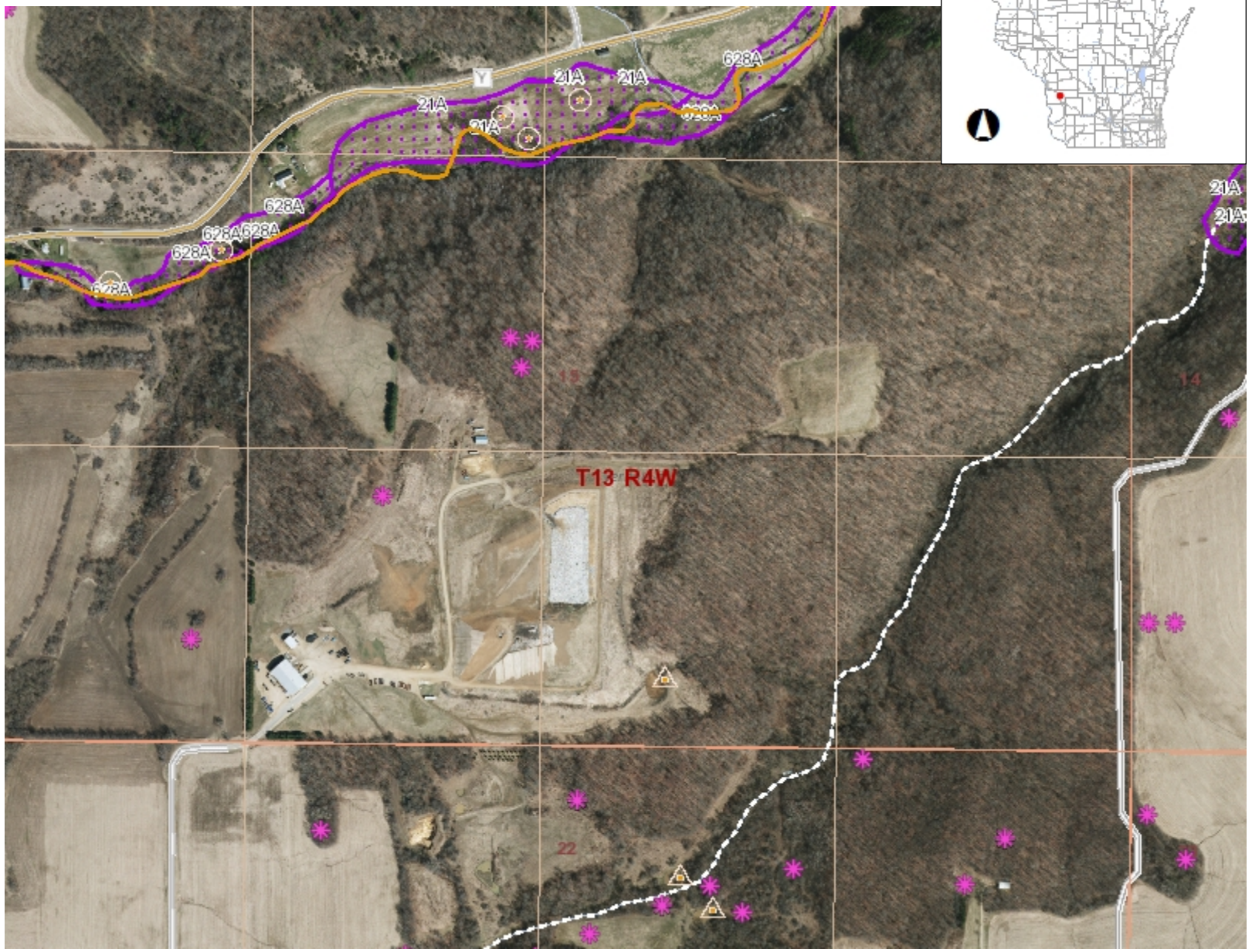
Years with missing data:	24 deg = 6	28 deg = 6	32 deg = 5
Years with no occurrence:	24 deg = 0	28 deg = 0	32 deg = 0
Data years used:	24 deg = 44	28 deg = 44	32 deg = 45
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	4/14 to 10/20: 189 days	4/29 to 10/9: 163 days	5/7 to 9/30: 146 days
70 percent *	4/9 to 10/25: 199 days	4/24 to 10/14: 173 days	5/2 to 10/6: 157 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

Creation date: 2016-07-22

G-2 – Vernon County Surface Water Data Viewer Map

Surface Water Data Viewer Map





Legend

- PNW-ASNRI Sensitive Areas of Lakes
- PNW-ASNRI Wild and Scenic Rivers
- PNW-ASNRI Outstanding and Exceptional Streams
- PNW-ASNRI Trout Streams
- PNW-ASNRI Wild Rice Streams
- PNW-ASNRI Outstanding and Exceptional Lakes
- PNW-ASNRI Special Area Management Plan Streams
- PNW-ASNRI Special Wetlands Inventory Study Streams
- PNW-ASNRI Coastal Wisconsin Wetlands Streams
- PNW-ASNRI Special Area Management Plan Areas
- PNW-ASNRI Special Wetlands Inventory Study Areas
- PNW-ASNRI Coastal Wisconsin Wetlands Areas
- PNW-ASNRI Wild Rice Areas
- PNW-ASNRI Trout Spring Ponds
- PNW-ASNRI State Natural Areas
- PNW-PRF Other Public Rights Features
- PNW Musky Streams
- PNW Sturgeon Streams
- PNW Musky Areas
- PNW Sturgeon Areas
- PNW Walleye Areas

Notes

NRCS Wetspots

0.3 0 0.13 0.3 Miles

NAD_1983_HARN_Wisconsin_TM

1: 7,920

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Appendix H

FAA Correspondence

H-1 – FAA Email Notification
H-2 – FAA Email Response

H-1 – FAA Email Notification

Building a Better World for All of Us®

October 23, 2020

RE: Vernon County Landfill
Proposed Landfill Expansion (WDNR License No. 3268)
SEH No. VERSW 157634 14.00

FAA Airport Division
AGL - 600
2300 East Devon Avenue
Des Plaines, IL 60018

Dear Sir or Madam:

Short Elliott Hendrickson Inc. (SEH) is submitting this letter on behalf of Vernon County to notify the Federal Aviation Administration (FAA), and other concerned parties, of the County's proposed expansion of the Vernon County Landfill (WDNR License No. 3268). This notification is being provided to meet the provisions and requirements outlined in the following State and Federal Rules and guidance:

- s. NR504.04(3)(e) Wisconsin Administrative Code
- 40 CFR 258.10 –Airport Safety
- 49 USC Section 44718(d), as amended by Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L No. 106-181 (April 5, 2000)
- FAA Advisory Circular AC No. 150/5200-34A (January 26, 2006) : Construction or Establishment of Landfills Near Public Airports
- FAA Advisory Circular AC No. 150/5200-33B (August 28, 2007) : Hazardous Wildlife Attractants On Or Near Airports

The proposed Vernon County Landfill Expansion (Landfill Expansion) is located in the Southern Half of Section 12, T13N, R4W, Town of Viroqua, Vernon County, Wisconsin. The proposed horizontal landfill expansion encompasses approximately 10-acres due west and north and contiguous to the current permitted landfill. As shown the Attached Figure 1, "Site Location" the landfill expansion is located approximately 2.8 miles northeast of the closest runway at the Viroqua Municipal Airport and the existing landfill and expansion are not located in the approach or departure path for the airport.

The limitations of 49 USC Section 44718(d) apply to new municipal solid waste landfills (MSWLF's), which are defined as a municipal waste landfill that was established or constructed after April 5, 2000. Additionally, FAA Advisory Circular AC No. 150/5200-34A states that 49 USC Section 44718(d) does not apply to the expansion or modification of an existing MSWLF. The current active Vernon County Landfill was first constructed in 1993, therefore exempt from the limitations of 49 USC Section 44718(d).

As part of the last expansion process, Vernon County issued a letter to the FAA on May 29, 2002 notifying interested parties of their intention to expand. In a letter dated June 16, 2002 the FAA responded with a letter concurring with the proposal relative to compatibility standards contained in FAA Advisory Circular AC No. 150/5200-33, with the following conditions:

1. The landfill facility must be properly supervised to assure that the bird populations are not increasing and that appropriate control procedures are being followed.
2. Any increases in bird activity that might be hazardous to safe aircraft operations will result in prompt mitigation actions and/or closure of the landfill
3. The above conditions must be clearly defined via State/Local licensing procedures associated with establishment of the landfill.
4. The landfill owner/operator should develop and implement a Wildlife Hazard Management Plan for operation of the landfill.

A Wildlife Hazard Management Plan (Plan) was included in their Plan of Operation, which has been approved by the WDNR and part of the facility operating record. The Plan utilizes the following strategies:

- Minimization of standing water areas
- Minimization of uncovered waste areas
- Prompt revegetation of disturbed areas outside of the waste footprint
- Utilization of bird harassment techniques, perch deterrents, and avoidance structures, as needed

We understand that the FAA does not approve or disapprove of solid waste landfill locations but is primarily concerned about location relative to safety. We request that you review this letter and attachments and reply with your assessment of the proposed landfill expansion. Please contact me at 608.498.4844 with any questions or concerns.

Sincerely,

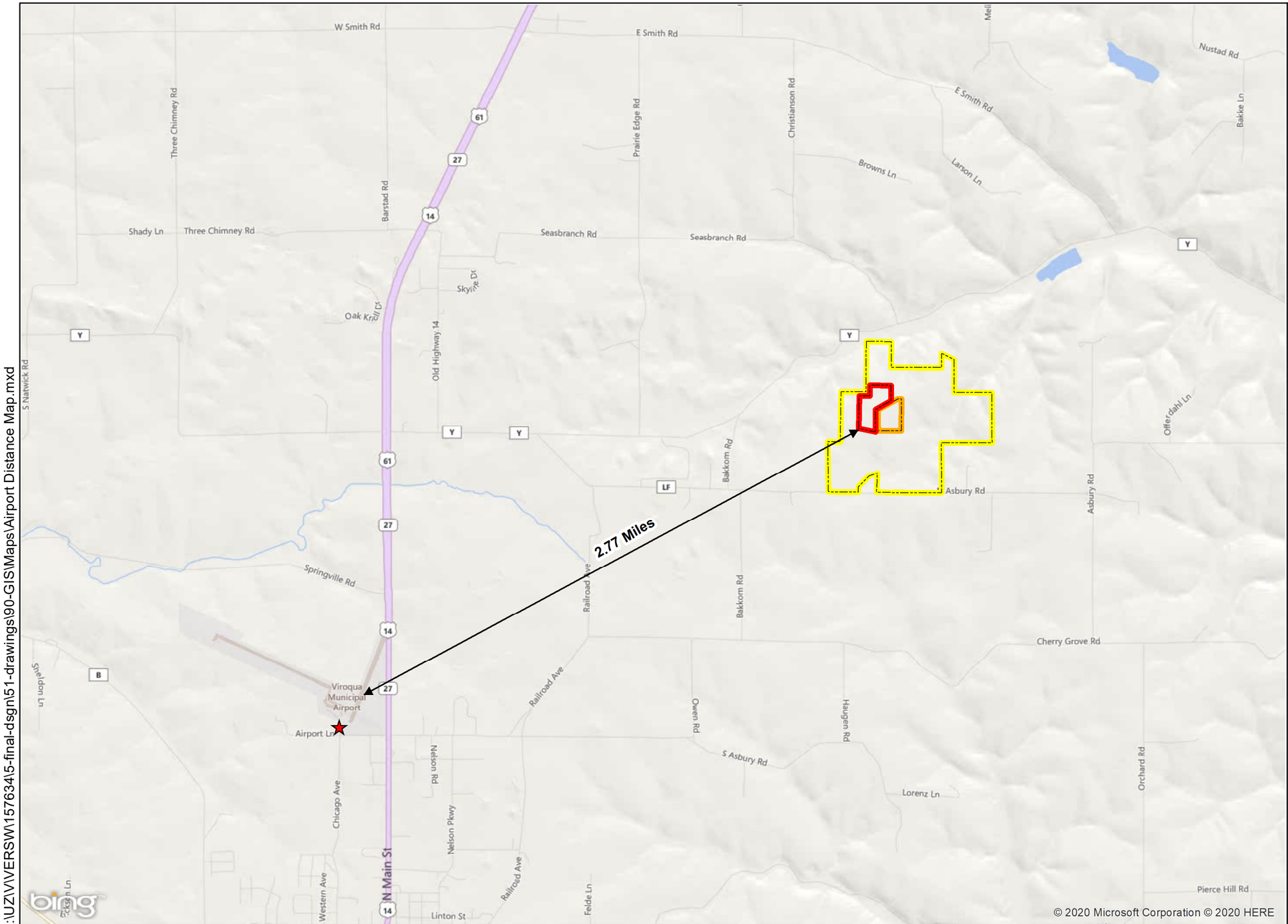
SHORT ELLIOTT HENDRICKSON INC.



Brian L. Kent, CHMM
Project Manager

BLK
Attachment
c: Stacie Sanborn, Vernon County Solid Waste (electronic)
Stacey Miller, Wisconsin DOT, Bureau of Aeronautics
Michael Skildum, Viroqua Municipal Airport Manager
Darryl R. Heaps, SEH (electronic)

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Legend

- Landfill Property Boundary
- Active Landfill Limits
- Approximate Limits of Proposed Horizontal Landfill Expansion

N
W E
S

0 0.25 0.5 1 Miles

Source:
Vernon County, and WIDNR.
Projection:
Vernon County Coordinates, Feet
Map by:
rjh

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. If errors or discrepancies are found please contact SEH GIS Services. This user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.

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SEH
10 North Bridge Street
Chippewa Falls, WI 54729
PHONE: (715) 720-6200
FAX: (715) 720-6300
WATTS: 800-472-5881
www.sehinc.com

PROJECT: VERSW157634

DATE: 10/20/2020

ISI REQUEST
VERNON COUNTY LANDFILL
(WIDNR LICENSE NO.3268)

Distance to Viroqua Municipal Airport

Figure 1

H-2 – FAA Email Response

From: Beauchamp, Bobb (FAA)
To: Brian Kent
Subject: RE: Vernon County Landfill
Date: Friday, March 19, 2021 2:20:11 PM

Mr. Kent,

This email is responding to your October 23, 2020 notification of a proposed horizontal expansion at the Vernon County Landfill. Your notification was to meet provisions and requirements of:

- s. NR504.04(3)(e) Wisconsin Administrative Code
- 40 CFR 258.10 –Airport Safety
- 49 USC Section 44718(d), as amended by Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L No. 106-181 (April 5, 2000)
- FAA Advisory Circular AC No. 150/5200-34A (January 26, 2006) : Construction or Establishment of Landfills Near Public Airports
- FAA Advisory Circular AC No. 150/5200-33B (August 28, 2007) : Hazardous Wildlife Attractants On Or Near Airports

This e-mail of course only responds on behalf of the FAA and the Federal provisions shown above.

We concur with your conclusion that the provisions of 49 USC 44718(d) do not apply to this proposed expansion of the Vernon County Landfill. These provisions specifically do not apply to landfills that were constructed or in operation prior to April 5, 2000. The Vernon County Landfill was first constructed in 1993. In addition, the Viroqua Airport does not have regularly scheduled service in addition to general aviation operations, so the provisions of FAA AC 150/5200-34A, Construction or Establishment of Landfills Near Public Airports do also not apply.

Regarding the provisions of FAA Advisory Circular No 150/5200-33B, Hazardous Wildlife Attractants On Or Near Airports: The Landfill is outside the 10,000' area of primary concern identified in the AC. While FAA encourages the Landfill to continue its efforts under their Wildlife Hazard Management Plan, we recognize that FAA does not have regulatory or approval authority over the Landfill in this regard.

Based on the above, FAA has no objection to the proposed expansion at the Vernon County Landfill. Please feel free to contact me if you have any questions or additional concerns.

From: Brian Kent <bkent@sehinc.com>
Sent: Thursday, March 18, 2021 4:02 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: RE: Vernon County Landfill

Thank you

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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From: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Sent: Thursday, March 18, 2021 1:46 PM
To: Brian Kent <bkent@sehinc.com>
Subject: RE: Vernon County Landfill

Brian, I apologize for not getting back to you. I'll do my best to get you a more formal response by end of day tomorrow.

From: Brian Kent <bkent@sehinc.com>
Sent: Thursday, March 18, 2021 1:38 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: FW: Vernon County Landfill

Hi Bobb-
I apologize for my persistence but I am following up to check on the status of your response. Your response is needed as part of our permitting process and we are needing to get this to the WDNR in the very near future. Please reply at your earliest convenience. Thank you.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
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From: Brian Kent
Sent: Tuesday, March 2, 2021 9:55 AM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: RE: Vernon County Landfill

Hi Bobb-
I hope all is well. Just following up with the below email correspondence. I have not received a formal response and wondering if it perhaps was misplaced? Thanks much.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
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From: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Sent: Tuesday, December 29, 2020 3:08 PM
To: Brian Kent <bkent@sehinc.com>
Subject: RE: Vernon County Landfill

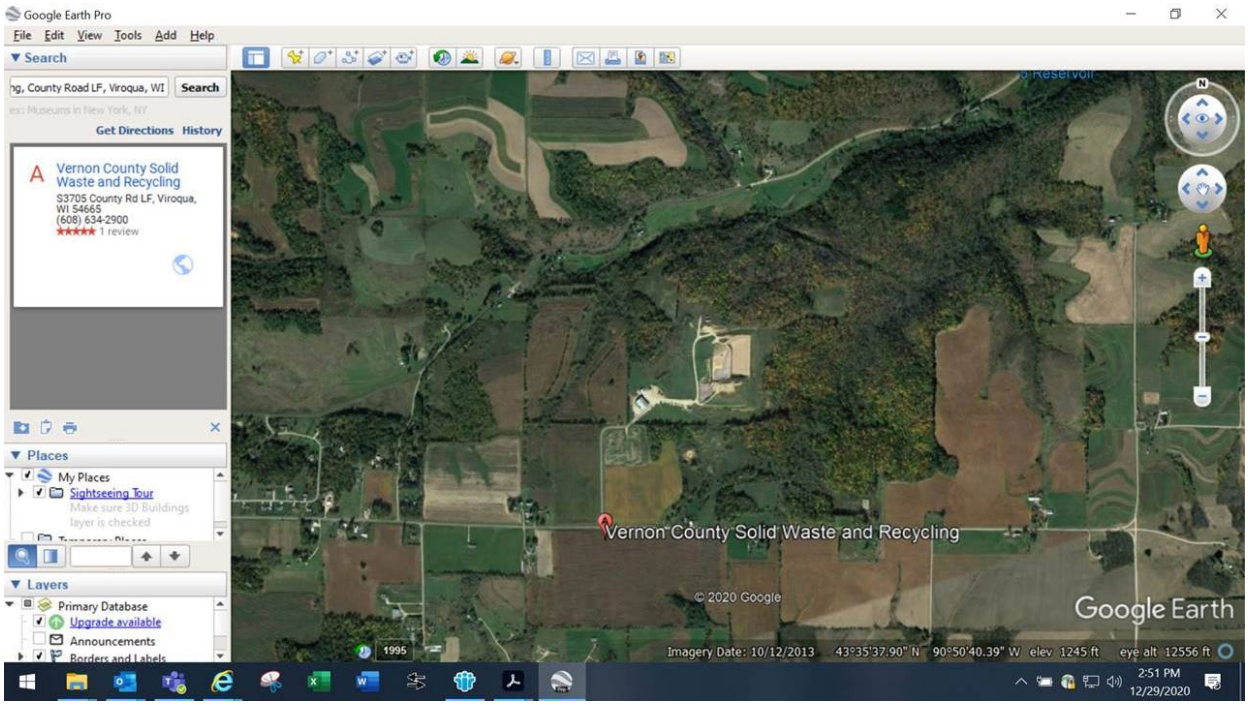
Great, that's the same facility I'm looking at.

Informally the expansion is exempt from 49 USC Section 44718(d) for 2 reasons: the expansion is of an existing landfill, and the Viroqua airport does not have regularly scheduled service in addition to general aviation. It's also outside the 10,000' area of primary concern put forth in FAA's Advisory Circular 150/5200-33B.

I'll work on a formal response email later this week.

From: Brian Kent <bkent@sehinc.com>
Sent: Tuesday, December 29, 2020 2:53 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: RE: Vernon County Landfill

Yes- below is a screen shot of what shows up for me.



Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct
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From: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Sent: Tuesday, December 29, 2020 2:14 PM
To: Brian Kent <bkent@sehinc.com>
Subject: RE: Vernon County Landfill

Hi Brian,

I'm also working remotely, and it's been impacting my normal ability to evaluate landfill requests such as this. Can you confirm that the facility identifies as Vernon County Solid Waste and Recycling on Google Earth?

From: Brian Kent <bkent@sehinc.com>
Sent: Tuesday, December 29, 2020 1:52 PM
To: Beauchamp, Bobb (FAA) <Bobb.Beauchamp@faa.gov>
Subject: Vernon County Landfill

Bobb-
Attached is the letter SEH issued on October 23, 2020 providing notification of Vernon County's plan to expand their existing municipal waste landfill. I had not heard anything yet so I figured I better check on the status. Please feel free to contact me to discuss should you have any questions or issues. Please note I am working remotely due to COVID. If you prefer to call, please call my cell number at 715.456.4621. Also, if you already responded by mail it is possible that I have not received it yet since it takes a while to get my mail with our office being closed. Thanks in advance for your response.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
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Appendix I

Alternate Geotechnical Investigation Report

I-1 – Alternate Geotechnical Program Request
I-2 – Response to AGIP Acceptance Letter

I-1 – Alternate Geotechnical Program Request

Alternate Geotechnical Program Request

Proposed Landfill Expansion

WDNR License No. 3268

VERSW 157634

Vernon County Landfill | December 13, 2021

SEH

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Engineers | Architects | Planners | Scientists

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December 13, 2021

RE: Proposed Landfill Expansion
Alternate Geotechnical Program Request
Vernon County Landfill
WDNR License No. 3268
SEH No. VERSW 157634 4.00

Ms. Carolyn Cooper, Hydrogeologist
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711-5367

Dear Ms. Cooper:

The Vernon County Landfill (WDNR License No. 3268) proposes to expand the existing landfill for disposal of municipal solid waste. On behalf of Vernon County, Short Elliott Hendrickson Inc. (SEH®) is requesting approval of the Alternative Geotechnical Program Request (Request) as specified under NR 512.085 Wisconsin Administrative Code (Wis. Adm. Code).

As part of this Request, we have compiled information on existing data sources to be used in conjunction with proposed new data to meet the requirement of the NR 512 Wis. Adm. Code feasibility report for the expansion of the Vernon County Landfill (Landfill Expansion). Approving the use of these data will make the feasibility report process more economical for the County, as well as expediting the process while providing the geotechnical information necessary to meet the requirements of NR 512.09 Wis. Adm. Code. The project schedule includes completion of the feasibility report field work during Spring 2022. We would appreciate receiving your approval at your earliest convenience, so that we can continue to make progress with the landfill permitting process. Should you have any questions or wish to discuss the program proposed, please contact the undersigned.

Sincerely,

Brian L. Kent, CHMM
Project Manager

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Alternate Geotechnical Program Request

Proposed Landfill Expansion
Vernon County Landfill

Prepared for:
Vernon County Landfill
Viroqua, Wisconsin

Prepared by:
Short Elliott Hendrickson Inc.
329 Jay Street, Suite 301
La Crosse, WI 54601-4034
608.782.3161

I, Melanie G. Niday, PG, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that to the best of my knowledge, all of the information contained in this document is correct and the document was pre-pared in compliance with all applicable requirements in chs.NR 700 to 726, Wis. Adm. Code.

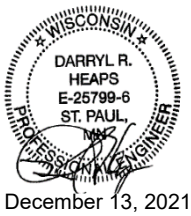
Melanie G. Niday, PG	672-013	12/13/2021
Project Hydrogeologist	PG Number	Date



December 13, 2021

I, Darryl R. Heaps, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A−E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A−E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Darryl R. Heaps, PE, CHMM	E-25799	12/13/2021
Project Engineer	PE Number	Date



December 13, 2021

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Distribution

No. of Copies	Sent to
1	Carolyn Cooper, Hydrogeologist Wisconsin Department of Natural Resources 3911 Fish Hatchery Road Fitchburg, WI 53711-5367
2	Colin Maus Waste Management Engineer Wisconsin Department of Natural Resources 3911 Fish Hatchery Road Fitchburg, WI 53711-5367
1	Joe Lourigan Hydrogeologist Wisconsin Department of Natural Resources PO Box 7921 Madison, WI 53707-7921
1	Valerie Joosten, PE Waste Management Engineer Wisconsin Department of Natural Resources 2984 Shawano Ave Green Bay, WI 54313-6727
1	Stacie Sanborn, Director of Solid Waste Vernon County Solid Waste Department S3705 County Road LF Viroqua, WI 54665
1	WDNR - Bureau of Waste Management 101 S. Webster Street PO Box 7921 Madison, WI 53707
1	Darryl Heaps, PE SEH 3535 Vadnais Center Drive St. Paul, MN 55110

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Alternate Geotechnical Program Request

Proposed Landfill Expansion

Prepared for Vernon County Landfill

1 Introduction

The Vernon County Solid Waste Department (County) owns and manages the Vernon County Landfill operating under Wisconsin Department of Natural Resources (WDNR) License No. 3268. The County is proposing to expand the existing landfill (Landfill Expansion) for disposal of municipal solid waste (MSW), commercial waste, and industrial waste. On behalf of the County, Short Elliott Hendrickson Inc. (SEH®) is issuing this Alternate Geotechnical Program Request (Request) for your review and approval as specified under NR 512.085 Wisconsin Administrative Code (Wis. Admin. Code). This alternative geotechnical program requests approval to use existing borings, field and laboratory data, and monitoring wells to meet a portion of the site-specific geotechnical information requirements and to provide exemptions, when appropriate, where additional information is needed. A supplemental geotechnical program is proposed to complete additional borings, obtain field and laboratory data, and install additional monitoring wells.

Section 1 presents the project description and associated geotechnical requirements. **Section 2** evaluates existing data against regulatory geotechnical requirements and discusses discrepancies. **Section 3** presents the proposed alternatives and requests for variance approvals in relationship to geologic site characteristics, proposed soil borings, proposed well and piezometer installations, laboratory and field-testing programs, and baseline water quality assessment.

1.1 Site Description

The Vernon County Solid Waste Department owns and operates an integrated waste management system on approximately 250-acres located in the Town of Viroqua, Wisconsin. The integrated waste management system includes:

- An approximate 10-acre municipal solid waste landfill, with an approximate design capacity of 590,000 cubic yards (WDNR License No. 3268)
- A closed small sized (50,000 cubic yard) C&D Landfill (WDNR License No. 3712)
- A recyclable material processing and baling facility

A general site map that outlines the waste management system described above is illustrated on **Figure 1**. The Vernon County Landfill was originally designed and permitted in early 1992 with three horizontal phases consisting of a design capacity of 315,000 cubic yards. A vertical expansion was approved in 2005, which included three additional vertical sequences and added 275,000 cubic yards of air space.

1.2 Landfill Expansion Description

The proposed Landfill Expansion includes a contiguous horizontal and vertical expansion of approximately 9-acres over and east of the existing municipal solid waste landfill (WDNR License No. 3268). The contiguous design promotes a minimized landfill footprint. The horizontal component consists of an approximate 4.0-acre horizontal expansion due east and contiguous to Phase III. The vertical component will extend the existing landfill vertically over an approximate 5.0-acre area of the existing footprint. The Landfill Expansion will overlay its waste onto existing Phase III. The existing conditions in the proposed expansion area are illustrated on **Figure 2**.

The preliminary subbase, base and final cover grades for the Landfill Expansion have been generated following the design requirements of NR 504 Wis. Adm. Code and positioned at least 10-feet above the seasonal high groundwater elevation. The preliminary subbase and conceptual grading plan are illustrated in **Figure 3**. The horizontal expansion area will consist of a composite liner system with the base graded in a herringbone configuration to convey leachate to the center collection trench and low sump area located on the southern end of the proposed cell. Details of the subbase, base liner, and final grades will be presented with the Feasibility Report.

Traversing the Landfill Expansion area from south to north as illustrated in **Figure 3**, preliminary clay subbase elevations are anticipated to range from approximately 1206 to 1250 feet. Modification of subbase elevations may be necessary based on the findings of the geotechnical investigation, geological investigation, and groundwater conditions. The weathered bedrock surface is illustrated in **Figure 4**; note that data for the actual depth to weathered bedrock in the Landfill Expansion area is limited. The competent bedrock surface is illustrated in **Figure 5**; similar to the weathered bedrock surface, note that data for the actual depth to competent bedrock in the Landfill Expansion area is also limited.

Preliminary base grades for the horizontal expansion mirror the subbase elevations with an additional 5 feet of elevation for the compacted clay liner system. The base elevations for the vertical expansion are immediately above the top of final permitted waste grades within the expansion footprint. The preliminary final grades for the proposed expansion include a total final cover thickness of 6.5-feet over the waste with a 12-inch grading layer. In accordance with s. NR 504.07 Wis. Adm. Code, the final cover will consist of, starting from the grading layer, 2-feet of compacted clay, a 40-mil geomembrane, a 1-foot granular drainage layer, 2-feet of rooting zone soil layer, and 6-inches of topsoil.

1.3 Geotechnical Requirements

The table from NR 512.09 Wis. Adm. Code that summarizes the geotechnical requirements for borings, wells, and piezometers is included below:

Coarse–Grained Soil Environments			
Piezometers	Water Table Observation Wells	Borings	Area
2	5	10	First 5 or less acres
–	1	2	Each additional 5 or less acres
1	–	–	Each additional 10 or less acres
Fine–Grained Soil Environments			
Piezometers	Water Table Observation Wells	Borings	Area
4	5	10	First 5 or less acres
–	1	2	Each additional 5 or less acres
2	–	–	Each additional 10 or less acres

As described further in **Section 2.1**, the geology at the Vernon County Landfill consists of unconsolidated loess and residuum, underlain by weathered dolomite, and dolomite. The unconsolidated materials consist primarily of silt and clay, which meet the physical criteria of a fine-grained soil environment. Therefore, based on the horizontal Landfill Expansion footprint of 4.0-acres, the number of borings, water table monitoring wells, and piezometers required for the geotechnical investigation are summarized as follows:

- 10 Soil Borings
- 5 Water Table Monitoring Wells
- 4 Piezometers

As part of the alternative geotechnical program, we propose to use existing borings, water table wells, and piezometers to meet a portion of the requirements of NR 512.09(1) and (2) Wis. Adm. Code. Further details on geotechnical requirements as they may pertain to the Landfill Expansion are discussed in the following sections. In addition, NR 512.09(3) Wis. Adm. Code stipulates that all borings, well installations, well development, well abandonments, and in-field hydraulic conductivity testing shall be observed by a professional geologist or directly supervised by a professional geologist.

1.3.1 Borings

NR 512.09(1) stipulates that soil borings be completed for the following conditions:

- Borings shall extend 25-feet below the anticipated sub-base grade.
- One boring shall extend 5-feet into bedrock outside the proposed limits of filling.
- Samples shall be collected and retained in accordance with NR 507.05 and 507.14 Wis. Adm. Code.

1.3.2 Wells and Piezometers

NR 512.09(2) Wis. Adm. Code stipulates that water table wells and piezometers be completed for the following conditions:

- All wells shall be located no more than 300 feet from the proposed limits of filling.
- Half of the wells shall be located no more than 150 feet from the proposed limits of filling.

1.3.3 Laboratory and Field Analysis

NR 512.09(2) Wis. Adm. Code stipulates that laboratory and field analysis be completed as follows:

Analysis	Frequency
Grain Size Distribution (mechanical and hydrometer methods)	5 samples per major soil unit
Atterberg Limits (fine grained soils as appropriate)	5 samples per major soil unit
Soil Classification	All Samples
Laboratory Hydraulic Conductivity (fine grained soils as appropriate)	2 samples per major soil unit
In-Situ Hydraulic Conductivity	Each Well

1.3.4 Static Water Elevations

NR 512.09(4)(e) and (f) Wis. Adm. Code stipulate that stabilized water level measurements be obtained from wells and surface water features (within 1,000 feet of the proposed limits of filling) on a monthly basis for 6-months prior to the submittal of the feasibility report. After this period, quarterly water levels shall be obtained for at least four (4) quarters.

1.3.5 Baseline Groundwater Monitoring

NR 512.09(4)(g) Wis. Adm. Code stipulates that at least four (4) rounds of baseline groundwater monitoring must be performed on all observation wells and piezometers and submitted with the feasibility report.

2 Assessment of Existing Data

The area that comprises the horizontal Landfill Expansion consists of 4.0-acres located immediately east of the municipal solid waste landfill operating under WDNR License No. 3268. Due to the proximity of the Landfill Expansion to the existing permitted facilities, a number of existing borings, field and laboratory data, and monitoring wells are available to meet a portion of the site-specific geotechnical information requirements; where additional information is needed, a supplemental geotechnical program is proposed in **Section 3.0** to complete additional borings, obtain field and laboratory data, and install additional monitoring wells.

2.1 Geological Site Characteristics

The proposed Landfill Expansion is located in a geological environment typically characterized as follows from youngest to oldest (top to bottom):

- Loess – windblown fine sands and silt
- Residuum – pedogenic (soil formation) clay minerals and weathered in-place bedrock
- Competent bedrock

Locally, the ridges visible on the surface topography are capped by dolomite bedrock, weathered in-place as residuum, but having physical features characteristic of the bedrock such as dolomite fragments. However, the valleys often have sediment also previously referred to as residuum but has more recently been determined to be evidence of clay mineral formation with residual carbonate rock and altered loess and colluvium as parent material (Knox, et al., 1990; Evans and Hartemink; 2012).

Based on information from previous investigations presented in the Feasibility Report for the Vernon County Landfill Vertical Expansion (Central Wisconsin Engineers & Architects Inc, August 2003), the residuum and weathered bedrock can typically be drilled with solid stem or hollow stem auger. The shallower competent bedrock, primarily consisting of dolomite, can be drilled with an air rotary hammer or cored with an air rotary rig or a versa-sonic drilling rig. Although, low RQD occurred with use of a versa-sonic drilling rig during investigations completed in 2003. Deeper bedrock units encountered on-site consist of dolomitic sandstones, dolomite, siltstones, and sandstone.

2.2 Existing Boring Log Data

Since 1987 approximately 95 soil borings have been completed at the Vernon County Landfill (WDNR License No. 3268) ranging in depth from 5 to 234 feet. Approximately 73 soil borings were completed prior to the submittal of the original 1990 Feasibility Report. An additional 8 borings were completed between 1990 and 2003 as part of expansion efforts, monitoring well installation, or well replacement. An additional 14 borings were completed during 2021 as part of expansion efforts. For a majority of soil borings, soils were classified using the Unified Soil Classification System (USCS) following methods outlined in ASTM D2488 and information regarding standard penetration tests (ASTM D1586) are provided for the soil borings until competent bedrock was encountered.

The existing soil borings reviewed as part of this Request meet the intent of NR 512.09 Wis. Adm. Code. There are 18 soil borings that fall within 300 feet of the Landfill Expansion as listed in **Table 1**. Copies of available soil boring logs are included in **Appendix A**. Locations of existing soil boring and monitoring wells located within 300-feet of the landfill expansion are illustrated in **Figure 2**. Logs for additional on-site soil borings which are outside the 300-foot distance are also included in **Appendix A** and referenced in **Table 1** for supplemental information only.

Final subbase grade elevations have not been determined but aren't projected to go below 1200 feet NGVD (the preliminary subbase elevations are shown in **Figure 3**). The following information summarizes the depths and elevations of the 18 soil borings previously installed within 300 feet of the proposed expansion area:

- Soil borings range in depth from 15 to 210 feet; corresponding elevations of the bottom of the soil borings range from 1023.0 to 1217.9 feet.
- Weathered bedrock was encountered in all 18 soil borings; corresponding elevations of the weathered bedrock range from 1176.5 to 1220.9 feet.
- Competent bedrock was encountered in 11 of 18 soil borings; corresponding elevations of the competent bedrock range from 1147.5 to 1209.9 feet.
- Four (4) locations (9 of the 18 soil borings) within 300-feet of the proposed expansion area contained soil borings that were advanced a minimum of 25 feet below the estimated subbase grade elevation of 1200 feet, with the corresponding bottom elevations ranging from 1023.0 to 1113.4 feet.
- Four (4) locations (7 of the 18 soil borings) within 300-feet of the proposed expansion area contained soil borings that were advanced more than 5 feet (NR 512.09(1)(c)) into competent bedrock. The depth that borings were advanced into competent bedrock ranges from 42 to 145 feet.
- Soil borings were sampled in accordance with NR 507.05 and 507.14; however, given the dates of soil boring completion, no soil samples are currently retained.

In comparison with the soil boring criteria established in NR 512.09 Wis. Adm. Code, six (6) additional soil borings are required to meet the regulatory requirements. Information from the previously completed soil borings, generally characterize the soils for the Landfill Expansion; however, because additional wells and bedrock information will be needed to confirm weathered and competent bedrock elevations as part of proposed landfill expansion design and construction, additional soil borings are proposed as described in **Section 3.0**.

The data listed above will be used to supplement new data on the geological cross-sections presented in the Feasibility Report.

2.3 Existing Wells and Piezometers

Since 1987 more than 20 monitoring wells and piezometers have been completed at the Vernon County Landfill (WDNR License No. 3268) ranging in depth from 95 to 234 feet. More than 20 monitoring wells and piezometers were utilized to fulfill well and piezometer requirements previously with the most recent landfill expansion efforts occurring in 2003 (Central Wisconsin Engineers & Architects Inc, August 2003). There are currently 22 active monitoring wells and piezometers at the facility.

Table 2 lists the existing wells and piezometers within the Landfill Expansion footprint, within 150-feet of the Landfill Expansion, and within 300-feet of the Landfill Expansion that will be useful for evaluating groundwater conditions as part of the well and piezometer requirements of NR 512.09(1) and (2) Wis. Adm. Code. Copies of available well construction information are included in **Appendix B**. Locations of monitoring wells and piezometers located within 300-feet of the Landfill Expansion are illustrated in **Figure 2**. Information on additional monitoring wells and piezometers outside the 300-foot distance are also included in **Appendix B** and referenced in **Table 2** for supplemental information only.

In the vicinity of the Landfill Expansion area, information regarding the existing monitoring wells and piezometers are summarized as follows:

- Two (2) water table monitoring wells and five (5) piezometers are located within 300-feet of the Landfill Expansion area.
- One (1) water table monitoring well and two (2) piezometers are currently present within the Landfill Expansion footprint.
- One (1) piezometer is located within 150-feet of the Landfill Expansion footprint.

As stated above, it is understood that it is the WDNR's policy to allow the use of wells and piezometers for vertical expansion over existing landfill areas, but not for any horizontal expansion. The County requests an exemption to this policy to allow the use of these wells and piezometers to meet the referenced NR 512 requirements. With that approval, at a minimum, installation of three (3) monitoring wells are required to meet the minimum criteria of NR 512.9 Wis. Adm. Code. The proposed monitoring wells and piezometers are described in **Section 3.0**.

2.4 Existing Laboratory and Field Analysis

Since 1987 approximately 75 soil samples collected as part of past site investigations have been subjected to laboratory tests for the Vernon County Landfill (WDNR License No. 3268) as part of landfill investigations and construction projects. In addition, hydrogeologic conditions have been evaluated through routine measurements of static water elevations and performing in-field hydraulic conductivity tests and analysis. The following sections summarize information from laboratory and field data available for the site.

2.4.1 Soil Laboratory Testing

Table 3 summarizes laboratory tests completed on soil samples across the entire landfill site for sieve analysis, hydrometer tests, Atterberg limits, coefficient of permeability, and density. Previous soil laboratory testing data appears to meet the criteria established in NR 512.09 Wis.

Adm. Code. Given the lateral extent and type of formation of the geologic units present at the site, it is useful to evaluate the uniformity of the physical properties of the geologic units for the entire site. Based on the soil testing results, physical characteristics of the geologic units are well defined. The number of samples analyzed by geologic unit and laboratory results are summarized as follows:

- Loess (24 samples): Where present, loess deposits can be generally described as a light brown to dark brown silt with clay to clay with silt (ML or CL) averaging 0 percent gravel, 1.6 percent sand, 73.9 percent silt, and 25.0 percent clay. The fine-grained sediment content exhibits an average Liquid Limit of 37.7 and a Plasticity Index of 15.6. There was one Coefficient of Permeability test analyzed with a result of 2.4 x 10^{-7} cm/sec.
- Residuum (51 samples): The residuum can be generally described as brown to red-brown clay with silt (CL to CH), dolomite fragments, and occasional sandy layers. The sandy layers are generally described as yellow to yellow brown sand with silt and clay (SC to GM). The fine-grained residuum (CL to CH) averages 2.8 percent gravel, 21.2 percent sand, 36.9 percent silt, and 43.1 percent clay. Two "undisturbed" samples have been able to be obtained within the fine-grained residuum with an average for Coefficient of Permeability of 5.77 x 10^{-7} cm/sec (range of 2.34 x 10^{-8} cm/sec to 1.13 x 10^{-6} cm/sec). The coarse-grained residuum (SC to GM) averages 10.7 percent gravel, 61.8 percent sand, 14.1 percent silt, and 12.6 percent clay. Two "undisturbed" samples have been able to be obtained within the coarse-grained residuum with an average for Coefficient of Permeability of 6.75 x 10^{-3} cm/sec (range of 2.96 x 10^{-7} cm/sec to 1.35 x 10^{-2} cm/sec).

Although soil laboratory data for the landfill property is quite extensive and will provide the basis for evaluating the physical properties of the site, additional information will be needed to confirm geotechnical conditions as part of proposed Landfill Expansion design, additional soil laboratory testing is proposed as described in **Section 3.0**.

2.4.2 In-situ Field Testing

During 2003, slug tests (falling and/or rising head tests) were performed on 14 wells across the entire landfill property (Central Wisconsin Engineers & Architects Inc, August 2003); calculations for hydraulic conductivity were completed based on Bouwer and Rice. A summary of the existing hydraulic conductivities are provided in **Table 4**. For the locations where in-situ field testing was completed previously, the in-situ field testing appears to meet the criteria established in NR 512.09 Wis. Adm. Code.

Based on the minimum, geometric mean, and maximum values of hydraulic conductivity presented in **Table 4**, the hydrogeologic properties for each geologic unit can be described as follows:

- **Loess (0 slug tests):** Groundwater generally does not occur within loess deposits at the site; no wells are screened in loess and in-field hydraulic conductivity testing cannot be conducted.
- **Residuum (0 slug tests):** Groundwater generally does not occur within residuum deposits at the site; no wells are screened in residuum and in-field hydraulic conductivity testing cannot be conducted.
- **Bedrock (14 slug tests):** The hydraulic conductivity of the bedrock is separated into two units: dolomite, hard, with occasional small vugs and sandy dolomite to dolomitic sandstone. The dolomite has a range of 1.67 x 10^{-3} cm/sec to 1.27 x 10^{-2} cm/sec, with a

geometric mean of 5.47 x 10^{-3} cm/sec. The sandy dolomite to dolomitic sandstone has a range of 2.19 x 10^{-4} cm/sec to 3.07 x 10^{-2} cm/sec, with a geometric mean of 3.46 x 10^{-3} cm/sec. The bedrock (dolomite to sandy dolomite to dolomitic sandstone), as a geologic unit, would appear to provide more uniform hydraulic conductivity, but variability in the soil properties may also occur including presence of sandy lenses, differential weathering, fracturing, or preferred flow paths.

Hydraulic conductivity data for the landfill property is sufficient and will provide the basis for evaluating the hydrogeologic conditions at the site. However, because additional information will be needed to confirm in the vicinity of the Landfill Expansion, additional slug tests are proposed on any new well installations or wells not tested previously as described in **Section 3.0**.

2.4.3 Static Water Elevations

Static water levels are collected in all site monitoring wells and piezometers twice per year in conjunction with the routine monitoring program. **Table 5** provides a summary of the existing monitoring wells and piezometers that are routinely monitored for static water elevations across the site. Static water elevations for the past five years are included for all wells, although some water level data is available for several wells dating back to 1988. Recent groundwater elevations indicate the water table has risen within several monitoring wells across the landfill site by 8 to 15 feet between 2016 and 2020 with an even higher increase occurring in September of 2017. The increase is consistent with “groundwater flooding” occurring across the state of Wisconsin as described by the WDNR on their website. As a result, existing wells that were originally installed to monitor water table conditions, may now have water levels just above the screened interval; for purposes of site evaluation these wells that monitor “near” water table conditions are considered water table monitoring wells.

A water table contour map for the landfill property for September 2020, provided as **Figure 6**, indicates a groundwater divide occurs near well MW-14 north of the existing landfill and proposed expansion with groundwater flow to the northeast and groundwater flow to the south to southeast within the landfill disposal areas. Based on available nested wells, vertical components of flow in several well nests result in downward vertical gradients near or above one (1) indicating a strong resistance to vertical groundwater movement. Previous studies have presented the hydraulic conditions as indicative of perched groundwater.

In the vicinity of the Landfill Expansion, the depth to water ranges from around 60 to 90 feet below ground surface (bgs), which corresponds to an elevation ranging from 1130 to 1160 feet NGVD. Static water level data are available from several wells surrounding the Landfill Expansion area dating back to 1988.

Because additional information will be needed to confirm groundwater conditions as part of proposed landfill expansion design, additional monitoring wells and piezometers are proposed as described in **Section 3.0**. Water level measurements will be obtained monthly from new wells and piezometers for 6-months prior to the submittal of the Feasibility Report in accordance with NR 512.09(4)(e) and (f) Wis. Adm. Code, as well as quarterly water levels obtained for at least four (4) quarters following the submittal.

2.5 Existing Groundwater Monitoring Data

2.5.1 Local Groundwater Quality

Groundwater in the Lower Wisconsin River basin is generally of very good quality and is usable for most purposes. The main chemical constituents in the groundwater within the basin are calcium, magnesium, and bicarbonate ions, which are derived primarily from solution of dolomite and limestone bedrock. Regional differences in groundwater quality occur due to regional variability in the soil and rock through which the groundwater moves (Hindall, 1974).

Hardness as calcium carbonate is above 180 mg/L in 80 percent of sampled wells, and above 225 mg/L in 65 percent of sampled wells. This indicates hard water, and softening is often required for many domestic uses. The median dissolved solids content is approximately between 260 and 350 mg/L in groundwater in the drainage basin (Hindall, 1974).

2.5.2 Landfill Groundwater Monitoring

There are currently 22 active monitoring wells across the Vernon County Landfill (WDNR License No. 3268). The current groundwater monitoring wells located within 300-feet of the proposed expansion area have been in place since 1988, 1989, and 2003. The groundwater monitoring wells are routinely sampled twice per year under existing licenses, with the list of parameters varying between monitoring well and sampling event.

There are eleven (11) existing wells within the proposed expansion footprint and within 300-feet of the proposed expansion including three water table wells and four well nests (water table well and one to three piezometers). The wells include MW-5/MW-5A (within footprint, eastern edge, nested wells), MW-14/MW-14Z (within footprint, northern edge, nested wells), MW-3/MW-4/MW-4P/MW-6 (upgradient, nested wells), and MW-10/MW-11/MW-12 (downgradient, nested wells). Of the existing wells, MW-5/MW-5A and MW-14/MW-14Z are located side gradient of, and part of the monitoring system for the current municipal solid waste landfill (License No. 3268). Well nest MW-10/MW-11/MW-12 is located downgradient of, and part of the monitoring system for, the current municipal solid waste landfill (License No. 3268). Upgradient water quality data for the site is provided by monitoring well MW-3/MW-4/MW-4P/MW-6 located north and approximately 200 feet outside of the proposed expansion area. Annual or semi-annual monitoring has previously been collected from existing wells MW-5A, MW-14/MW-14Z, MW-3/MW-4/MW-4P/MW-6, and MW-10/MW-11/MW-12.

A majority of the wells located within 300-feet of the proposed expansion area show no to minimum impacts from the existing site activities. There are seven (7) parameters that are found to exceed their ch. NR 140 ES and/or PAL in at least one well located within 300-feet of the proposed expansion area. Four of these parameters (fluoride, iron, lead, and manganese) which are exceeded at least once within MW-3, MW-4P, MW-5A, MW-6, MW-10, MW-11, MW-12, and MW-14 are attributed to natural sources. One of these parameters (mercury) was exceeded one or two times within MW-5A, MW-10, MW-11, MW-14, and MW-14Z and probably represents “false positives”, which is a result of a sample and/or analytical error. Nitrate+nitrite has been exceeded at least once within MW-5A, MW-6, MW-14, and MW-14Z and is most likely due to agriculture which is a common land use in the surrounding area. Two wells (MW-5A and MW-12) had one PAL exceedance for Bromomethane in March 2020. This is the only detection of bromomethane in either of these wells in recent years and no trend or sufficient contamination

appears present. No other contaminations appear to be present within the 300-feet surrounding the proposed expansion area.

3 Alternative Geotechnical Program

As described in **Section 2.0**, a significant amount of data is available for the Vernon County Landfill site including the proposed Landfill Expansion area. However, supplemental information is proposed as part of the geotechnical evaluation at the site. The following section presents the proposed alternatives request as well as exemptions for approval in relationship to geologic site characteristics, proposed soil borings, proposed well and piezometer installations, laboratory and field-testing programs, and baseline water quality assessment.

3.1 Geological Site Characteristics Which Necessitate Exemptions

Previous investigations at the site have experienced difficulty in meeting several requirements of NR 507. To address the geological site characteristics related to the characteristics of the bedrock, Vernon County Landfill is requesting exemptions to the requirements of NR 507 as described in the following sections.

3.1.1 Bedrock Coring

NR 507.05(2) Wis. Adm. Code requires bedrock to be cored and the core samples to be retained. As described in **Section 2.1**, attempts to core bedrock have been unsuccessful primarily due to weathering, existing fractures, and layered heterogeneity of dolomite, dolomitic sandstone, and siltstone. Geologic data is available from previous borings completed at the site including coring at well nest MW-10/MW-11/MW-12 immediately south of the expansion and well nest MW-7/MW-8/MW-9. To improve recovery, verso-sonic was used to complete boring for well MW-14Z on the northern edge of the expansion as well as borings for wells MW-1RZ and MW-13P south of the existing landfill. Recovery improved, however, the verso-sonic method caused samples to be more disturbed making it sometimes difficult to distinguish bedrock features such as the presence of fractures and vugs. Therefore, the value of coring using versa-sonic and/or traditional coring methods is uncertain. In fact, mud rotary methods were effective at noting fracturing in the bedrock material. As a result, we request an exemption to NR 507.05(2) Wis. Adm. Code and propose that coring of bedrock not be attempted, and the rock be drilled and wash samples collected during drilling, as was implemented in previous investigations.

3.1.2 Drilling Fluids

NR 507. 06(1) Wis. Adm. Code requires that drilling fluids not be used unless no reasonable alternative exists. As described in **Section 2.2**, past investigations have shown that drilling within bedrock with hollow stem auger cannot be accomplished. We therefore request an exemption to use bentonite drilling mud to advance the drill holes to depth.

To ensure that the majority of the drilling mud has been removed from each well, well development will include removal of a minimum of five (5) well volumes (including filter pack) and measurements of field parameters between each well volume until measurements have stabilized and turbidity is negligible. This alternative procedure was approved in the past and we request approval to continue using it for wells installed for the feasibility and plan of operation and the proposed expansion.

3.2 Alternative Program of Borings

Vernon County Landfill is requesting an alternative program be approved regarding the boring program required under NR 512.09 Wis. Adm. Code.

It is understood that it is the WDNR's policy to allow the use of existing borings, wells, and piezometers for vertical expansion over existing landfill areas but not for any horizontal expansion. In such areas, the WDNR requires the landfill to construct the number of new borings, wells and piezometers necessary to meet the requirements of NR 512.09(1) and (2) Wis. Adm. Code.

Based on the information presented on in **Section 2.2**, six (6) additional soil borings would be required to meet the regulatory requirements by using existing information. However, because additional information is needed to confirm weathered and competent bedrock as part of proposed landfill expansion design and construction, eight (8) additional soil borings are proposed to meet the requirements of NR 512.09 Wis. Adm. Code. Along with the four (4) existing borings that meet regulatory requirements, a total of twelve (12) borings would be present within 300-feet of the proposed expansion area, as summarized in the table below. Proposed drilling depths are summarized on **Table 6**. The proposed drilling depths are based on proposed subbase elevations and groundwater elevations as shown in **Figures 3 and 6**, respectively. Locations proposed for soil borings are illustrated in **Figure 7**. Given the site topography, final locations for soil boring may need to be modified to accommodate accessibility of a drill rig.

Soil Boring	Location Relative to Expansion	Boring Extends 25-feet Below Nearest Subbase (Yes/No)	Boring Extends 5-feet into Bedrock (Yes/No)	Notes
Existing Borings				
MW-5	Within proposed limits of filling	Yes	Yes	Nested with MW-5A
MW-6	Outside proposed limits of filling, within 300-feet	Yes	Yes	Nested with MW-3, MW-4, and MW-4P
MW-10	Outside proposed limits of filling, within 300-feet	Yes	Yes	Nested with MW-11 and MW-12
MW-14Z	Within proposed limits of filling	Yes	Yes	Nested with MW-14
Proposed Borings				
MW-14WT	Outside proposed limits of filling within 300-feet	Yes	Yes	
MW-15WT	Outside proposed limits of filling within 300-feet	Yes	Yes	
MW-16	Outside proposed limits of filling within 300-feet	Yes	Yes	
MW-17WT	Outside proposed limits of filling within 300-feet	Yes	Yes	
B-18	Within proposed limits of filling	Yes	No	
B-19	Within proposed limits of filling	Yes	No	
B-20	Within proposed limits of filling	Yes	No	
B-21	Within proposed limits of filling	Yes	No	

Information regarding the proposed soil borings is summarized as follows:

- Four (4) drilling locations (MW-14WT, MW-15WT, MW-16, and MW-17WT) outside the Landfill Expansion footprint fall within 150 feet of the proposed waste boundary upgradient, sidegradient, and downgradient of the Landfill Expansion. Soil borings for wells MW-14WT, MW-15WT, and MW-17WT will be advanced into the water table for shallow well installation; the soil boring for well nest MW-16WT/MW-16 will be advanced below the water table to accommodate water table well and piezometer construction.
- Four (4) drilling locations (B-18 through B-21) fall within the Landfill Expansion footprint. Soil borings will all be advanced to at least 25 feet below the proposed landfill subbase elevation.

Allowing the use of existing soil borings (4) along with the proposed soil borings (8) will supplement the existing information to provide an adequate number of soil borings to meet the NR 512.09 Wis. Adm. Code requirements. Existing soil boring information as described in **Section 2.2** and provided in **Appendix A** will be used to supplement the proposed soil borings.

3.3 Alternative Program for Wells and Piezometers

Vernon County Landfill is requesting an alternative be approved regarding the wells and piezometers required under NR 512.09 Wis. Adm. Code.

As stated above, it is understood that it is the WDNR's policy to allow the use of existing wells, and piezometers for vertical expansion over existing landfill areas, but not for any horizontal expansion. However, given the proximity of the Landfill Expansion as sidegradient and contiguous to the existing permitted disposal facility, portions of the proposed monitoring system for the proposed expansion area are currently part of the existing monitoring program under License No. 3268.

As described in **Section 2.3**, existing wells MW-5A/MW-5, MW-14/MW-14Z, MW-3/MW-4/MW-4P/MW-6, and MW-10/MW-11/MW-12 were installed and monitored in conjunction with previous expansion activities. As a result, three (3) monitoring wells and eight (8) piezometers are located within the proposed expansion area or within 300 feet of the Landfill Expansion area which does not meet the total well and piezometer requirements under NR 512.09 Wis. Adm. Code. Each of these wells are useful in evaluating groundwater conditions of the Landfill Expansion area. To supplement the existing monitoring wells and piezometers, four (4) additional monitoring wells and one (1) additional piezometer are proposed as described in **Table 7** with proposed locations illustrated in **Figure 7**. Using the existing wells and piezometers along with those that are proposed, the combined total will include seven (7) monitoring wells and ten (10) piezometers to comply with NR 512.09 Wis. Adm. Code; a summary table of wells is provided below. Given the site topography, final locations for the monitoring wells and piezometer may need to be modified to accommodate accessibility of a drill rig. The proposed well and piezometer locations have been located to minimize the need to be removed to accommodate landfill construction and, therefore, should be available for long-term monitoring purposes.

Monitoring Well	Distance from Expansion	Monitoring Point	Notes
Existing Wells			
MW-3	within 300-feet	Piezometer	Nested with MW-4P, MW-4, and MW-6
MW-4P	within 300-feet	Water Table	Nested with MW-3, MW-4, and MW-6
MW-4	within 300-feet	Piezometer	Nested with MW-3, MW-4P, and MW-6
MW-5A	within footprint	Water Table	Nested with MW-5
MW-5	within footprint	Piezometer	Nested with MW-5A
MW-6	within 300-feet	Piezometer	Nested with MW-3, MW-4P, and MW-4
MW-10	within 300-feet	Piezometer	Nested with MW-11 and MW-12
MW-11	within 300-feet	Piezometer	Nested with MW-10 and MW-12
MW-12	within 300-feet	Water Table	Nested with MW-10 and MW-11
MW-14	within 150-feet	Piezometer	Nested with MW-14Z
MW-14Z	within footprint	Piezometer	Nested with MW-14
Proposed Wells			
MW-14WT	within 150-feet	Water Table	
MW-15WT	within 150-feet	Water Table	
MW-16WT	within 150-feet	Water Table	Nested with MW-16
MW-16	within 150-feet	Piezometer	Nested with MW-16WT
MW-17WT	within 150-feet	Water Table	

Information on the proposed wells and piezometer is summarized as follows:

- Four (4) shallow or water table wells are proposed for installation. One well (MW-14WT) is proposed north and upgradient of the Landfill Expansion; one well (MW-15WT) is proposed east and sidegradient of the Landfill Expansion; one well (MW-16WT) is located east and sidegradient to the Landfill Expansion; and one well (MW-17WT) is located southeast and downgradient to the Landfill Expansion. Each well will be constructed with a 10-foot long screen situated approximately 7-feet into the water table as observed during drilling.
- One (1) piezometer is proposed for installation. The one proposed piezometer (MW-16) will be nested with the shallow water table well MW-16WT. The piezometer will be constructed with a 5-foot screen situated a minimum of 15-feet below the bottom elevation of the water table well.

Allowing the use of existing wells, the proposed new wells and piezometer will supplement the existing information to provide an adequate number of wells and piezometers to meet the NR 512.09 Wis. Adm. Code requirements. These wells will be background groundwater quality wells for the Landfill Expansion. Due to the required grading to accommodate construction, the existing monitoring wells MW-5/MW-5A and MW-14/MW-14Z will need to be sealed as they are located within the Landfill Expansion Footprint or very close to the footprint. Also, due to grading needed to the east of the Landfill Expansion, top of casings at monitoring wells MW-15WT and MW-16WT/MW-16 will need to be adjusted during construction. These issues will be addressed in the plan of operation monitoring plan.

3.4 Alternative Program for Laboratory and Field Analysis

Vernon County Landfill is requesting an alternative program be approved regarding the laboratory and field analysis required under NR 512.09. The following section presents the requested

exemptions in reference to grain-size distribution and Atterberg limits and the Coefficient of Permeability. No exemption is being requested for in-field hydraulic conductivity analysis or measurement of static water levels.

3.4.1 Grain-size Distribution and Atterberg Limits

NR 512.09(4)(a) requires that for each major soil unit, at least five representative samples be analyzed for grain size distribution and Atterberg limits. The planned geotechnical program intends to fulfill geotechnical requirements of NR 512.09(1) and (2). However, because weathered dolomite and competent dolomite is present on-site, Atterberg limits cannot be established for these site soils.

The fine-grained units (loess and residuum) on-site will be tested for grain-size distribution using mechanical and hydrometer methods and Atterberg limits to meet the requirements of NR 512.09 Wis. Adm. Code.

3.4.2 Laboratory Hydraulic Conductivity

NR 512.09(4)(b) Wis. Adm. Code requires that hydraulic conductivity be conducted on two representative soil samples from each major fined-grained unit. The two fine-grained units identified on-site are loess and residuum. Two thin wall samples will be collected from each of the fine-grained units on-site to determine Coefficient of Permeability to meet the requirement of NR 512.09(4)(b) Wis Adm. Code.

In addition, we request an exemption from this requirement for the weathered dolomite and competent dolomite since relatively undisturbed samples cannot be obtained. If deemed feasible during field work, an alternate sampling method using the brass-lined split-spooned sampler (ASTM D 4700) will be attempted in weathered dolomite to collect undisturbed samples for laboratory testing.

3.5 Previously Collected Data

Vernon County Landfill requests an exemption to use all of the previously collected data to meet requirements of NR 512.09 Wis. Adm. Code. Use of this data would include, but not be limited to, the following:

- In-field hydraulic conductivity tests completed on the existing wells.
- Grain size analysis, Atterberg limits, soil classification, and laboratory hydraulic conductivity from past investigations.
- Soil boring logs from past investigations which are not totally compliant with the present NR 507.05 Wis. Adm. Code but provide useful and accurate data.
- Existing groundwater quality data as background data.

3.6 Alternative Program for Groundwater Monitoring

3.6.1 Water Elevation Data Collection

Vernon County Landfill is not requesting an alternative be approved regarding the collection of water elevation data under NR 512.09(4)(e) and (f) Wis. Adm. Code which stipulates water level measurements be collected on a monthly basis for 6-months prior to the submittal of the Feasibility Report.

Water elevations will be collected from all new wells on a monthly basis following installation for at least 6 months prior to submittal of the Feasibility Report. Water levels from existing wells within 300-feet of the Landfill Expansion will be collected on a schedule commensurate with new wells that will provide comparative data and meet current license requirements prior to submittal of the Feasibility Report.

3.6.2 Baseline Monitoring

Vernon County Landfill is not requesting an alternative be approved regarding the collecting of baseline monitoring data under NR 512.09 (4)(g) Wis. Adm. Code which stipulates that at least four (4) rounds of baseline groundwater monitoring must be performed on all observation wells and piezometers and submitted with the Feasibility Report.

Four rounds of baseline water monitoring of all new wells and piezometers that fall within 300-feet of the Landfill Expansion will be conducted prior to submittal of the Feasibility Report; existing wells and piezometers that have not been monitored for baseline requirements will also be sampled for four rounds of baseline monitoring. Semi-annual monitoring of the existing wells will continue in accordance with the facility permits.

3.7 Report Preparation

3.7.1 Geologic Cross-Sections

NR 512.11(2) Wis. Adm. Code requires that geological cross-sections be constructed through all borings. Since we have a considerable amount of boring and monitoring well data for the proposed Expansion, we request an exemption to the requirement and propose to construct cross sections only through the borings and wells that assist in defining the lateral and vertical extent of the major lithostratigraphic units.

3.7.2 Soil Boring Logs

NR 507.14 and NR 140.23 requires that soil boring information be presented on WDNR forms and include the information listed in NR 507.14(2), (3) and (4) Wis. Adm. Code. Some historic soil boring logs from the WDNR files for the year 1987 are not available. However, some historical soil boring descriptions are presented on geological figures in historical files. Although sufficient information is provided from available and proposed soil boring logs, we request an exemption of the use of all historical logs during final presentation in the Feasibility Report, if appropriate, to assist in the overall site interpretation.

4 Summary

On behalf of Vernon County, SEH requests approval of an alternative geotechnical program for the NR 512 feasibility report for the expansion of the Vernon County Landfill. The Landfill Expansion is proposed directly east of the current municipal solid waste landfill. The entire landfill site as well as the Landfill Expansion area have a wealth of geotechnical data available from past investigations which we wish to use for the feasibility report for the proposed expansion. Approving the use of these data will make the Feasibility Report process more economical for the County, as well as expediting the process.

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Tables

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Existing Soil Borings for Landfill Property
Vernon County Landfill

Soil Boring Nomenclature	Year Installed	Drilling Company	Ground Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Depth to Weathered Bedrock (feet bgs)	Weathered Bedrock Elevation (feet NGVD)	Depth to Competent Bedrock (feet bgs)	Competent Bedrock Elevation (feet NGVD)	Boring Log Available (Y/N) [1]
Borings within 300-feet										
MW-3	1987	Ace Well Drilling	1233.0	180.0	1053.0	20.0	1213.0	80.0	1153.0	Y
MW-4/-4P	1987	Ace Well Drilling	1232.9	160.0	1072.9	20.0	1212.9	80.0	1152.9	Y
TB-4	1988	Wisconsin Test Drilling	1232.9	15.0	1217.9	12.0	1220.9	NE	NE	Y
TB-5	1988	Wisconsin Test Drilling	1221.0	25.0	1196.0	22.0	1199.0	NE	NE	Y
TB-6	1988	Wisconsin Test Drilling	1218.7	16.5	1202.2	13.5	1205.2	NE	NE	Y
TB-7	1988	Wisconsin Test Drilling	1245.4	47.5	1197.9	38.0	1207.4	NE	NE	Y
TB-8	1988	Wisconsin Test Drilling	1249.4	45.5	1203.9	42.0	1207.4	NE	NE	Y
MW-5A	1989	Exploration Technology	1224.0	103.0	1121.0	17.5	1206.5	NA	NA	Y*
MW-5	1988	Ace Well Drilling	1223.3	180.0	1043.3	20.0	1203.3	35.0	1188.3	Y
MW-6	1988	Ace Well Drilling	1233.0	210.0	1023.0	14.0	1219.0	80.0	1153.0	Y
MW-10	1989	Exploration Technology	1215.6	181.0	1034.6	24.5	1191.1	61.0	1154.6	Y
MW-11	1989	Exploration Technology	1216.4	163.0	1053.4	24.5	1191.9	61.0	1155.4	Y
MW-12	1989	Exploration Technology	1216.4	103.0	1113.4	24.5	1191.9	61.0	1155.4	Y
TB-15	1989	Exploration Technology	1193.5	12.0	1181.5	11.5	1182.0	NE	NE	Y
MW-14/14Z	2003	Traut Hydro Tech	1247.5	210.0	1037.5	71.0	1176.5	100.0	1147.5	Y
B-15	2021	Mathy Construction Co	1252.9	45.0	1207.9	40.0	1212.9	45.0	1207.9	Y
B-16	2021	Mathy Construction Co	1245.9	36.0	1209.9	32.0	1213.9	36.0	1209.9	Y
B-17	2021	Mathy Construction Co	1238.8	39.0	1199.8	28.0	1210.8	39.0	1199.8	Y
Borings outside 300-feet										
MW-1	1987	Ace Well Drilling	1236.4	200.0	1036.4	28.0	1208.4	80.0	1156.4	Y
MW-2	1987	Ace Well Drilling	1252.5	190.0	1062.5	30.0	1222.5	40.0	1212.5	Y
AB-1	1987	James Construction Co.	1255.5	19.0	1236.5	19.0	1236.5	NE	NE	Y
AB-2	1987	James Construction Co.	1256.7	8.0	1248.7	6.0	1250.7	8.0	1248.7	Y
AB-3	1987	James Construction Co.	1257.3	6.0	1251.3	6.0	1251.3	NE	NE	Y
AB-4	1987	James Construction Co.	1257.2	6.5	1250.7	6.5	1250.7	NE	NE	Y
AB-5	1987	NA	NA	NA	NA	NA	1243.0	NA	NA	N
AB-7	1987	James Construction Co.	1261.1	20.0	1241.1	20.0	1241.1	NE	NE	Y
AB-8	1987	James Construction Co.	1260.0	8.0	1252.0	8.0	1252.0	NE	NE	Y
AB-9	1987	NA	NA	NA	NA	NA	1238.0	NA	NA	N
AB-10	1987	NA	NA	NA	NA	NA	1228.0	NA	NA	N
AB-11	1987	James Construction Co.	1258.9	21.0	1237.9	21.0	1237.9	NE	NE	Y
AB-15	1987	NA	NA	NA	NA	NA	1224.0	NA	NA	N
AB-18	1987	NA	NA	NA	NA	NA	1237.0	NA	NA	N
AB-19	1987	NA	NA	NA	NA	NA	1241.0	NA	NA	N
AB-21	1987	NA	NA	NA	NA	NA	1248.0	NA	NA	N
AB-22	1987	NA	NA	NA	NA	NA	1240.0	NA	NA	N
AB-23	1987	NA	NA	NA	NA	NA	1235.0	NA	NA	N
AB-24	1987	NA	NA	NA	NA	NA	1223.0	NA	NA	N
AB-25	1987	NA	NA	NA	NA	NA	1218.0	NA	NA	N
AB-28	1987	NA	NA	NA	NA	NA	1221.0	NA	NA	N

Table 1
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Existing Soil Borings for Landfill Property
Vernon County Landfill

Soil Boring Nomenclature	Year Installed	Drilling Company	Ground Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Depth to Weathered Bedrock (feet bgs)	Weathered Bedrock Elevation (feet NGVD)	Depth to Competent Bedrock (feet bgs)	Competent Bedrock Elevation (feet NGVD)	Boring Log Available (Y/N) [1]
Borings outside 300-feet										
AB-29	1987	NA	NA	NA	NA	NA	1209.0	NA	NA	N
AB-30	1987	NA	NA	NA	NA	NA	1207.0	NA	NA	N
TB-1	1988	Wisconsin Test Drilling	1234.9	17.0	1217.9	NE	NE	NE	NE	Y
TB-2	1988	Wisconsin Test Drilling	1252.7	19.5	1233.2	17.0	1235.7	NE	NE	Y
TB-3	1988	Wisconsin Test Drilling	1253.4	14.5	1238.9	14.0	1239.4	NE	NE	Y
TB-9	1988	Wisconsin Test Drilling	1236.2	22.0	1214.2	NE	NE	NE	NE	Y
TB-10	1989	Exploration Technology	1258.8	18.0	1240.8	16.0	1242.8	NE	NE	Y
TB-11	1989	Exploration Technology	1253.9	26.0	1227.9	15.0	1238.9	NE	NE	Y
TB-12	1989	Exploration Technology	1259.1	15.0	1244.1	12.0	1247.1	NE	NE	Y
TP-1	1989	NA	1245.5	5.0	1240.5	3.5	1242.0	NE	NE	Y
TP-2	1989	NA	1251.4	6.5	1244.9	6.5	1244.9	NE	NE	Y
TP-3	1989	NA	1254.6	9.5	1245.1	9.5	1245.1	NE	NE	Y
TP-4	1989	NA	1258.3	8.5	1249.8	7.5	1250.8	NE	NE	Y
TP-7	1989	NA	1258.9	10.0	1248.9	NE	NE	NE	NE	Y
TP-8	1989	NA	1251.9	8.5	1243.4	NE	NE	NE	NE	Y
TP-9	1989	NA	1239.4	8.0	1231.4	7.0	1232.4	NE	NE	Y
TP-10	1989	NA	1234.8	11.0	1223.8	NE	NE	NE	NE	Y
TP-11	1989	NA	1244.9	7.0	1237.9	7.0	1237.9	NE	NE	Y
TP-15	1989	NA	1250.7	NA	NA	NE	NE	NE	NE	Y
TP-16	1989	NA	1236.0	5.5	1230.5	NE	NE	NE	NE	Y
TP-18	1989	NA	1234.9	8.0	1226.9	NE	NE	NE	NE	Y
TP-19	1989	NA	1250.9	5.5	1245.4	NE	NE	NE	NE	Y
TP-20	1989	NA	1251.3	12.5	1238.8	NE	NE	NE	NE	Y
TP-21	1989	NA	1241.0	14.0	1227.0	NE	NE	NE	NE	Y
TP-22	1989	NA	1255.0	11.0	1244.0	11.0	1244.0	NE	NE	Y
TP-23	1989	NA	1252.3	12.0	1240.3	10.0	1242.3	NE	NE	Y
TP-24	1989	NA	1243.4	12.0	1231.4	NE	NE	NE	NE	Y
TP-25	1989	NA	1236.2	10.0	1226.2	NE	NE	NE	NE	Y
TP-26	1989	NA	1248.5	8.5	1240.0	8.5	1240.0	NE	NE	Y
TP-27	1989	NA	1251.0	NA	NA	NE	NE	NE	NE	Y
TP-28	1989	NA	1242.1	9.5	1232.6	NE	NE	NE	NE	Y
TP-A	1989	NA	1255.0	9.0	1246.0	9.0	1246.0	NE	NE	Y
TP-B	1989	NA	1258.0	9.0	1249.0	NE	NE	NE	NE	Y
TP-C	1989	NA	1257.8	11.5	1246.3	NE	NE	NE	NE	Y
TP-D	1989	NA	1252.0	8.5	1243.5	8.5	1243.5	NE	NE	Y
MW-7	1989	Exploration Technology	1255.7	234.5	1021.2	21.0	1234.7	44	1211.7	Y
MW-8R	1989	Exploration Technology	1256.1	207.0	1049.1	21.5	1234.6	44.0	1212.1	Y
MW-9	1989	Exploration Technology	1255.4	131.5	1123.9	21.5	1233.9	44.0	1211.4	Y
TP-100	1991	NA	1255.0	20.0	1235.0	NE	NE	NE	NE	Y

Table 1
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Existing Soil Borings for Landfill Property
Vernon County Landfill

Soil Boring Nomenclature	Year Installed	Drilling Company	Ground Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Depth to Weathered Bedrock (feet bgs)	Weathered Bedrock Elevation (feet NGVD)	Depth to Competent Bedrock (feet bgs)	Competent Bedrock Elevation (feet NGVD)	Boring Log Available (Y/N) [1]
Borings outside 300-feet										
TP-101	1991	NA	NA	26.0	NA	NE	NE	NE	NE	Y
TP-102	1991	NA	NA	18.0	NA	18.0	NA	NE	NE	Y
MW-1R	1994	Ace Well Drilling	1245.0	166.0	1079.0	55.0	1190.0	74.0	1171.0	Y
MW-1PR	1994	Ace Well Drilling	1245.0	126.0	1119.0	57.0	1188.0	57.0	1188.0	Y
MW-1RZ	2003	Traut Hydro Tech	1244.0	185.0	1059.0	75.0	1169.0	98.0	1146.0	Y
MW-13P	2003	Traut Hydro Tech	1224.5	100.0	1124.5	49.0	1175.5	75.0	1149.5	Y
B-1	2021	Mathy Construction Co	1252.8	25.0	1227.8	13.0	1239.8	25.0	1227.8	Y
B-2	2021	Mathy Construction Co	1252.2	50.0	1202.2	47.0	1205.2	50.0	1202.2	Y
B-3	2021	Mathy Construction Co	1251.1	11.0	1240.1	3.0	1248.1	11.0	1240.1	Y
B-5	2021	Mathy Construction Co	1257.4	19.0	1238.4	13.0	1244.4	19.0	1238.4	Y
B-6	2021	Mathy Construction Co	1254.9	12.0	1242.9	10.0	1244.9	12.0	1242.9	Y
B-8	2021	Mathy Construction Co	1258.7	38.0	1220.7	35.0	1223.7	38.0	1220.7	Y
B-9	2021	Mathy Construction Co	1253.7	42.0	1211.7	38.0	1215.7	42.0	1211.7	Y
B-11	2021	Mathy Construction Co	1253.9	17.0	1236.9	11.0	1242.9	17.0	1236.9	Y
B-12	2021	Mathy Construction Co	1259.9	47.0	1212.9	35.0	1224.9	47.0	1212.9	Y
B-13	2021	Mathy Construction Co	1258.2	43.0	1215.2	37.0	1221.2	43.0	1215.2	Y
B-14	2021	Mathy Construction Co	1257.3	49.0	1208.3	40.0	1217.3	49.0	1208.3	Y

Notes:

NA - Information not available.

(1) - If boring log isn't available but weathered and competent bedrock elevations are present. The elevations were taken from previously submitted site figures.

NE - Not encountered.

* - Only page 1 of the soil boring log is available.

Table 2
Existing Monitoring Wells and Piezometers for Landfill Property
Vernon County Landfill

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NGVD)	Top of Casing Elevation (feet NGVD)	Well Depth (feet bgs)	Screen Length (feet)	Screen Interval Elevation (feet NGVD)	Monitoring Point	Geologic Description of Screened Interval
Monitoring Wells and Piezometers Inside Expansion Footprint									
109	MW-5A	11/8/1989	1224.0	1225.81	103.3	15.0	1120.7 - 1135.7	Water Table	dolomite, hard
108	MW-5	2/17/1988	1223.3	1225.32	150.6	10.0	1072.7 - 1082.7	Piezometer	dolomite, hard
119	MW-14Z	3/7/2003	1247.5	1250.22	210.8	5.0	1036.7 - 1041.7	Piezometer	silty dolomitic sandstone
Monitoring Wells and Piezometers Within 150-feet									
118	MW-14	3/12/2003	1247.5	1249.69	186.1	15.0	1061.4 - 1076.4	Piezometer	fractured dolomite and sandy dolomite
Monitoring Wells and Piezometers Within 300-feet									
105	MW-3	2/2/1988	1233.0	1235.25	180.0	5.0	1053.0 - 1058.0	Piezometer	dolomite, hard
107	MW-4P	1/29/1988	1232.9	1235.19	95.0	10.0	1137.9 - 1147.9	Water Table	dolomite, hard
106	MW-4	1/28/1988	1233.2	1235.01	154.0	10.0	1079.2 - 1089.2	Piezometer	dolomite, hard, several crevices present
110	MW-6	2/20/1988	1233.0	1235.37	202.2	5.0	1030.8 - 1035.8	Piezometer	sandy dolomite
114	MW-10	9/15/1989	1215.6	1217.52	183.5	5.0	1032.1 - 1037.1	Piezometer	dolomitic sandstone to sandy dolomite
115	MW-11	9/29/1989	1216.4	1218.56	162.5	15.0	1053.9 - 1068.9	Piezometer	sandy dolomite to dolomitic sandstone
116	MW-12	9/22/1989	1216.4	1218.36	98.5	15.0	1117.9 - 1132.9	Water Table	dolomite with occasional small vugs
Monitoring Wells and Piezometers Outside 300-feet									
102	MW-1P	12/30/1987	1236.4	1238.41	111.1	10.0	1125.3 - 1135.3	Piezometer	dolomite, hard
101	MW-1	12/30/1987	1236.4	1238.11	158.0	10.0	1078.4 - 1088.4	Piezometer	dolomite, hard
121	MW-1PR	1/12/1994	1245.0	1247.61	127.7	15.0	1117.3 - 1132.3	Water Table	sandy dolomite to dolomitic sandstone
120	MW-1R	1/12/1994	1244.6	1247.25	164.6	15.0	1080.0 - 1095.0	Piezometer	dolomite, hard
123	MW-1RZ	3/12/2003	1244.0	1245.45	186.5	5.0	1057.5 - 1062.5	Piezometer	sandy dolomite to dolomitic sandstone
104	MW-2P	1/17/1988	1252.5	1254.88	124.8	10.0	1127.7 - 1137.7	Water Table	dolomite, hard, with occasional soft zones
103	MW-2	1/17/1988	1252.5	1254.35	174.6	10.0	1077.9 - 1087.9	Piezometer	dolomite, hard, with occasional soft zones
111	MW-7	11/7/1989	1255.7	1258.03	234.5	5.0	1021.2 - 1026.2	Piezometer	coring ended at 209 feet, no description
112	MW-8R	11/13/1989	1256.1	1258.84	202.5	15.0	1053.6 - 1068.6	Piezometer	sandy dolomite with sandstone interbeds
113	MW-9	8/29/1989	1255.4	1257.50	126.8	15.0	1128.6 - 1143.6	Water Table	dolomite with occasional small vugs
117	MW-13P	2/26/2003	1224.5	1227.42	102.4	15.0	1122.1 - 1137.1	Water Table	dolomite with occasional small vugs

Notes:
NA - Information not available.

Table 3
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Existing Soil Laboratory Analysis for Landfill Property
Vernon County Landfill

Boring ID	Sample No.	Sample Depth (feet bgs)	USCS Class	Grain-size Distribution					Atterberg Limits			Coefficient of Permeability (cm/sec)	Density (pcf)
				Percent Gravel	Percent Sand	Percent Passing No. 200 Sieve	Percent Silt	Percent Clay	Liquid Limit	Plastic Limit	Plasticity Index		
Loess													
MW-1RZ	S-1	3-6	CL	0.0	2.1	97.9	75.3	22.6	34.6	18.7	15.9	--	--
MW-7	S-4	4-5	CL	0.0	1.0	99.0	73.0	26.0	--	--	--	--	--
TB-1	1	2-5	CL	0.0	3.1	96.9	76.9	20.0	31.5	--	8.6	2.44E-07	--
TP-7	S1-7	1.5-2	CL	0.0	0.5	99.5	71.5	28.0	--	--	--	--	--
TB-7	--	2.5-16	CL	--	--	--	78.0	22.0	32.3	--	12.2	--	--
TB-8	--	2-6.5	CL	--	--	--	74.0	26.0	37.8	--	14.5	--	--
TB-9	--	1.5-9	CL	--	--	--	76.0	24.0	25.4	--	8.1	--	--
TB-10	S-2	3-4	CL	0.0	1.4	98.6	72.6	26.0	--	--	--	--	--
TP-8	1	3-4	CL	--	--	98.3	73.3	25.0	39.6	--	16.8	--	116.9
TP-10	1	2-3	CL	--	--	98.7	70.7	27.0	40.0	--	18.1	--	--
TP-11	1	1-2	CL	--	--	94.5	67.5	27.0	39.5	--	16.6	--	--
TP-15	1	1-2	CL	--	--	99.6	72.6	27.0	41.4	--	16.3	--	--
TP-15	2	3-4	CL	--	--	99.6	77.6	22.0	38.3	--	17.0	--	--
TP-20	1	2-3	CL	--	--	99.8	73.8	26.0	36.3	--	15.1	--	--
TP-20	2	4-5	CL	--	--	99.7	72.7	27.0	41.5	--	18.2	--	--
TP-20	3	8-9	CL	--	--	99.7	83.7	16.0	36.5	--	15.1	--	--
TP-21	1	2-3	CL	--	--	99.7	69.7	30.0	41.3	--	19.3	--	--
TP-21	2	6-7	CL	--	--	99.6	71.6	28.0	37.4	--	15.4	--	--
TP-22	1	3-4	CL	--	--	99.8	80.8	19.0	38.8	--	15.6	--	--
TP-25	1	1.5-2.5	CL	--	--	98.0	73.0	25.0	38.3	--	15.5	--	--
TP-27	1	1.5-2.5	CL	--	--	99.0	72.0	27.0	40.5	--	17.6	--	--
TP-C	1	3-3.5	CL	--	--	99.5	73.5	26.0	35.0	--	15.0	--	--
TP-C	2	5-6	CL	--	--	99.0	69.0	30.0	43.8	--	20.8	--	--
TP-D	1	3-4	CL	--	--	98.9	74.9	24.0	41.1	--	16.2	--	--
			Average	0.0	1.6	98.8	73.9	25.0	37.7	18.7	15.6	2.44E-07	116.9
			Minimum	0.0	0.5	94.5	67.5	16.0	25.4	18.7	8.1	2.44E-07	116.9
			Maximum	0.0	3.1	99.8	83.7	30.0	43.8	18.7	20.8	2.44E-07	116.9
Fine-grained Residuum													
MW-1RZ	S-7	71-73	CH	13.4	26.3	60.3	32.9	27.4	71.3	30.4	40.9	--	--
MW-7	S-16	14-15	CH	2.4	23.4	74.2	30.2	44.0	--	--	--	--	--
MW-14Z	S-1	48-50	CH	0.9	3.4	95.7	39.7	56.0	91.2	36.2	55.0	--	--
MW-14Z	S-2	66	CL	0.6	29.9	69.5	48.1	21.4	32.4	16.5	15.9	--	--
TB-1	4	9.5-10.5	CL	--	--	--	58.0	42.0	51.8	--	35.2	--	--
TB-3	2 & 3	1.5-6.0	CL	--	--	--	58.0	42.0	47.1	--	27.9	2.34E-08	--
TB-3	--	8.5-13	CL	4.0	37.3	58.7	6.7	52.0	48.5	--	29.8	--	--
TB-4	2	2-4	CL	--	--	--	50.0	50.0	53.4	--	33.8	--	--
TB-5	--	2-7.5	CL	--	--	--	31.0	69.0	55.3	--	32.2	1.13E-06	--
TB-6	5 to 7	8-13.5	CL	--	--	--	53.0	47.0	--	--	--	--	--
TB-10	S-4	14-16	CH	0.0	18.4	81.6	27.6	54.0	--	--	--	--	--
TB-11	S-2	5-6	CL	0.0	14.3	85.7	60.7	25.0	--	--	--	--	--
TB-11	S-5	20-21	CH	0.8	16.6	82.7	44.8	37.9	--	--	--	--	--
TP-7	2	3-4.5	CL	--	--	88.6	62.6	26.0	35.0	--	15.2	--	--
TP-7	3	6-8	CH	--	--	78.5	28.5	50.0	56.0	--	29.9	--	--
TP-8	2	5-5.5	CL	--	--	52.8	26.8	26.0	42.3	--	23.5	--	--
TP-8	3	6-7	CH	--	--	95.3	70.3	25.0	54.8	--	29.4	--	--
TP-10	2	6-7	CL	--	--	43.5	14.5	29.0	48.9	--	24.3	--	--
TP-10	3	9-10	PT	--	--	96.9	28.9	68.0	113.5	--	56.4	--	--
TP-11	2	3.5-4	CL	--	--	73.6	31.6	42.0	47.8	--	25.9	--	--
TP-20	4	10-11	CL	--	--	61.2	22.2	39.0	45.0	--	23.3	--	--
TP-21	3	8-9	CH	--	--	59.8	27.8	32.0	55.5	--	30.8	--	--
TP-22	3	9-10	CL	--	--	73.4	37.4	36.0	49.5	--	23.6	--	--
TP-23	1	6.5-10	CL	--	--	--	--	--	--	--	--	--	113.5
TP-25	2	4-5	CH	--	--	78.9	21.9	57.0	63.6	--	35.7	--	--
TP-27	2	4-5	CH	--	--	84.0	34.0	50.0	65.0	--	32.6	--	--
TP-A	1	4-5	CH	--	--	91.5	37.5	54.0	62.8	--	32.4	--	--
TP-A	2	7-8	CH	--	--	78.6	28.6	50.0	58.2	--	31.0	--	--
TP-B	1	3-4	CL	--	--	96.4	62.4	34.0	38.9	--	16.4	--	--
TP-B	2	5-6	CL	--	--	73.1	34.1	39.0	45.3	--	22.7	--	--
TP-B	3	8-9	CH	--	--	84.8	15.8	69.0	63.5	--	32.5	--	--
TP-C	3	7-8	CL	--	--	60.9	18.9	42.0	54.2	--	28.7	--	--
			Average	2.8	21.2	76.2	36.9	43.1	55.8	27.7	30.2	5.77E-07	113.5
			Minimum	0.0	3.4	43.5	6.7	21.4	32.4	16.5	15.2	2.34E-08	113.5
			Maximum	13.4	37.3	96.9	70.3	69.0	113.5	36.2	56.4	1.13E-06	113.5

Table 3
Page 2 of 2
Existing Soil Laboratory Analysis for Landfill Property
Vernon County Landfill

Boring ID	Sample No.	Sample Depth (feet bgs)	USCS Class	Grain-size Distribution					Atterberg Limits			Coefficient of Permeability (cm/sec)	Density (pcf)
				Percent Gravel	Percent Sand	Percent Passing No. 200 Sieve	Percent Silt	Percent Clay	Liquid Limit	Plastic Limit	Plasticity Index		
Coarse-grained Residuum													
MW-1RZ	S-2	13-15	SC	1.1	65.0	33.9	19.4	14.4	24.1	10.7	13.4	--	--
MW-1RZ	S-3	15-20	SM	0.0	77.4	22.6	--	--	--	--	--	--	--
MW-1RZ	S-4	33-34	SM	10.2	68.0	21.8	--	--	--	--	--	--	--
MW-1RZ	S-5	49-50	SC	6.9	57.9	35.2	17.3	18.0	40.1	17.6	22.5	--	--
MW-1RZ	S-6	58-60	GM	49.6	30.7	19.7	10.6	9.1	--	--	--	--	--
MW-1RZ	S-8	76-78	SM	2.3	51.4	46.3	--	--	--	--	--	--	--
MW-1RZ	S-9	86-88	SP-SM	0.9	87.8	11.3	--	--	--	--	--	--	--
MW-1RZ	S-10	88-90	SP-SM	67.7	21.1	11.2	--	--	--	--	--	--	--
MW-14Z	S-3	76-78	SM	12.5	66.8	20.7	--	--	--	--	--	--	--
TB-1	5	10.5-12	SC	0.0	55.4	44.6	--	--	--	--	--	--	--
TB-1	--	12-13	SC	0.0	50.6	49.4	--	--	--	--	--	--	--
TB-4	--	7-8	SC	6.7	74.5	18.8	--	--	--	--	--	--	--
TB-5	--	7.5-10	SC	0.2	63.2	36.6	--	--	--	--	--	--	--
TB-8	--	6.5-12	SC	0.5	81.3	18.2	9.2	9.0	--	--	--	1.35E-02	--
TB-8	--	14-22	SC	10.2	51.9	37.9	--	--	--	--	--	2.96E-07	--
TB-9	--	10-22	SM	1.7	86.2	12.1	--	--	--	--	--	--	--
TP-11	3	6-7	SC	--	--	33.6	--	--	--	--	--	--	--
TP-15	3	8-9	SC	--	--	29.1	--	--	--	--	--	--	--
TP-27	3	7-9	SC	--	--	32.2	--	--	--	--	--	--	--
			Average	10.7	61.8	28.2	14.1	12.6	32.1	14.2	18.0	6.75E-03	--
			Minimum	0.0	21.1	11.2	9.2	9.0	24.1	10.7	13.4	2.96E-07	--
			Maximum	67.7	87.8	49.4	19.4	18.0	40.1	17.6	22.5	1.35E-02	--

Notes:
-- - Information not analysis or not available.

Table 4
Existing In-Field Hydraulic Conductivity for Landfill Property
Vernon County Landfill

Well Name	Geologic Description of Screened Interval	Method	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
Dolomite, hard, with occasional small vugs				
MW-3	dolomite, hard	Bower and Rice	1.67E-03	4.73
MW-4P	dolomite, hard	Bower and Rice	5.93E-03	16.82
MW-9	dolomite with occasional small vugs	Bower and Rice	1.18E-02	33.54
MW-12	dolomite with occasional small vugs	Bower and Rice	1.27E-02	36.04
MW-13P	dolomite with occasional small vugs	Bower and Rice	3.28E-03	9.29
		Average	7.09E-03	20.08
		Geometric Mean	5.47E-03	15.50
		Minimum	1.67E-03	4.73
		Maximum	1.27E-02	36.04
Sandy Dolomite to Dolomitic sandstone				
MW-1PR	sandy dolomite to dolomitic sandstone	Bower and Rice	5.97E-03	16.93
MW-1RZ	sandy dolomite to dolomitic sandstone	Bower and Rice	3.07E-02	87.11
MW-6	sandy dolomite	Bower and Rice	1.59E-03	4.51
MW-7	NA	Bower and Rice	1.05E-02	29.81
MW-8R	sandy dolomite with sandstone interbeds	Bower and Rice	3.19E-03	9.05
MW-10	dolomitic sandstone to sandy dolomite	Bower and Rice	2.01E-03	5.71
MW-11	sandy dolomite to dolomitic sandstone	Bower and Rice	2.19E-04	0.62
MW-14	fractured dolomite and sandy dolomite	Bower and Rice	1.39E-02	39.48
MW-14Z	silty dolomitic sandstone	Bower and Rice	1.18E-03	3.34
		Average	7.70E-03	21.84
		Geometric Mean	3.46E-03	9.81
		Minimum	2.19E-04	0.62
		Maximum	3.07E-02	87.11

Notes:
cm/sec - centimeters per second.
ft/day - feet per day.
NA - Not available due to no description present on soil boring log.

Table 5
Existing Static Water Elevations for Landfill Property (2016-2020)
Vernon County Landfill

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NGVD)	Top of Casing Elevation (feet NGVD)	Well Depth (feet bgs)	Screen Length (feet)	Screen Interval Elevation (feet NGVD)	Static Water Elevation by Date (feet NGVD)									
								Mar-16	Sep-16	Mar-17	Sep-17	Mar-18	Sep-18	Mar-19	Sep-19	Mar-20	Sep-20
102	MW-1P	12/30/1987	1236.4	1238.41	111.1	10.0	1125.3 - 1135.3	1131.09	1131.86	1132.15	1133.05	1132.01	1132.07	1132.55	1133.01	1132.6	1132.56
101	MW-1	12/30/1987	1236.4	1238.11	158.0	10.0	1078.4 - 1088.4	1088.95	1095.63	1100.57	1107.15	1098.79	1099.2	1103.13	1104.78	1103.09	1102.14
121	MW-1PR	1/12/1994	1245.0	1247.61	127.7	15.0	1117.3 - 1132.3	1134.06	1134.87	1135.22	1135.73	1134.86	1134.79	1135.15	1135.67	1135.4	1135.22
120	MW-1R	1/12/1994	1244.6	1247.25	164.6	15.0	1080.0 - 1095.0	1089.06	1095.71	1100.58	1107.05	1098.69	1099.14	1103.04	1104.59	1102.97	1102.03
123	MW-1RZ	3/12/2003	1244.0	1245.45	186.5	5.0	1057.5 - 1062.5	1088.58	1095.21	1100.11	1106.59	1098.3	1098.75	1102.6	1104.2	1102.54	1101.58
104	MW-2P	1/17/1988	1252.5	1254.88	124.8	10.0	1127.7 1137.7	1139.56	1140.67	1140.63	1141.67	1139.82	1140.34	1140.64	1141.85	1141.03	1140.76
103	MW-2	1/17/1988	1252.5	1254.35	174.6	10.0	1077.9 - 1087.9	1086.00	1090.11	1092.13	1098.43	1092.72	1092.53	1095.31	1096.67	1095.32	1094.86
105	MW-3	2/2/1988	1233.0	1235.25	180.0	5.0	1053.0 - 1058.0	1067.67	1072.73	1077.01	1083.01	1077.49	1077.22	1080.8	1082.59	1080.42	1080.22
107	MW-4P	1/29/1988	1232.9	1235.19	95.0	10.0	1137.9 - 1147.9	1149.36	1151.22	1151.54	1152.88	1149.04	1150.85	1151.66	1153.37	1150.88	1151.96
106	MW-4	1/28/1988	1233.2	1235.01	154.0	10.0	1079.2 - 1089.2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
109	MW-5A	11/8/1989	1224.0	1225.81	103.3	15.0	1120.7 - 1135.7	1135.38	1136.48	1136.96	1139.3	1136.26	1136.54	1137.88	1139.73	1137.72	1138.27
108	MW-5	2/17/1988	1223.3	1225.32	150.6	10.0	1072.7 - 1082.7	1081.68	1083.57	1084.46	1087.71	1083.51	1083.69	1086.30	1087.23	1085.93	1086.23
110	MW-6	2/20/1988	1233.0	1235.37	202.2	5.0	1030.8 - 1035.8	1063.61	1068.35	1071.36	1076.13	1070.54	1071.89	1073.9	1075.63	1073.88	1073.53
111	MW-7	11/7/1989	1255.7	1258.03	234.5	5.0	1021.2 - 1026.2	1069.09	1074.14	1076.77	1081.39	1076.09	1077.19	1079.32	1080.77	1079.32	1078.89
112	MW-8R	11/13/1989	1256.1	1258.84	202.5	15.0	1053.6 - 1068.6	1074.86	1080.1	1084.4	1089.58	1084.56	1084.3	1087.91	1088.96	1087.42	1086.93
113	MW-9	8/29/1989	1255.4	1257.50	126.8	15.0	1128.6 - 1143.6	1139.69	1140.63	1140.73	1142.15	1140.24	1140.36	1141.06	1142.21	1140.92	1141.14
114	MW-10	9/15/1989	1215.6	1217.52	183.5	5.0	1032.1 - 1037.1	1080.59	1087.69	1093.68	1101.39	1092.78	1092.99	1097.75	1099.58	1098.09	1096.89
115	MW-11	9/29/1989	1216.4	1218.56	162.5	15.0	1053.9 - 1068.9	1088.05	1090.48	1098.93	1106.85	1097.89	1095.62	1102.91	1104.98	1100.85	1102.01
116	MW-12	9/22/1989	1216.4	1218.36	98.5	15.0	1117.9 - 1132.9	1132.59	1132.04	1133.75	1133.32	1130.62	1131.75	1132.41	1134.17	1132.29	1132.13
117	MW-13P	2/26/2003	1224.5	1227.42	102.4	15.0	1122.1 - 1137.1	1133.48	1134.13	1134.48	1135.01	1134.05	1134.08	1134.44	1134.98	1134.6	1134.56
118	MW-14	3/12/2003	1247.5	1249.69	186.1	15.0	1061.4 - 1076.4	1070.95	1077.48	1082.63	1088.25	1083.05	1082.42	1086.86	1087.89	1086.34	1086.00
119	MW-14Z	3/7/2003	1247.5	1250.22	210.8	5.0	1036.7 - 1041.7	1069.64	1073.9	1079.81	1085.48	1080.29	1078.48	1083.98	1082.36	1082.78	1083.11

Notes:
NA - Information not available.
NM - Not measured.

Table 6
Proposed Soil Borings for Landfill Expansion
Vernon County Landfill

Proposed Soil Boring	Approximate Coordinates		Existing Grade Elevation (feet NGVD)	Estimated Information			Proposed Information			
	Northing	Easting		Weathered Bedrock Elevation (feet NGVD)	Competent Bedrock Elevation (feet NGVD)	Water Table Elevation (feet NGVD)	Subbase Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Basis for Proposed Soil Boring Depth
MW-14WT	1362.5	1697.8	1243.8	1220	1160	1160	outside	94	1150	10 feet below the water table elevation
MW-15WT	974.5	1860.0	1219.3	1210	1181	1139	outside	90	1129	10 feet below the water table elevation
MW-16	546.6	1887.2	1179.2	1179	1172	1134	outside	85	1094	40 feet below the water table elevation
MW-17WT	306.0	1907.4	1199.9	1180	1162	1132	outside	78	1122	10 feet below the water table elevation
B-18	1128.2	1690.6	1239.0	1211	1174	1145	1239	25	1214	25 feet below subbase elevation
B-19	994.5	1690.3	1233.1	1205	1185	1140	1234	24	1209	25 feet below subbase elevation
B-20	679.5	1733.8	1215.1	1196	1180	1136	1219	21	1194	25 feet below subbase elevation
B-21	468.4	1612.9	1226.5	1191	1171	1134	1221	30	1196	25 feet below subbase elevation

Notes:
- Actual boring locations and depths may change due to field conditions.

Table 7
Proposed Monitoring Wells and Piezometers for Landfill Expansion
Vernon County Landfill

Proposed Well/ Piezometer	Approximate Coordinates		Existing Grade Elevation (feet NGVD)	Estimated Information			Proposed Information			
	Northing	Easting		Weathered Bedrock Elevation (feet NGVD)	Competent Bedrock Elevation (feet NGVD)	Water Table Elevation (feet bgs)	Soil Boring Depth (feet bgs)	Screen Length (feet)	Screened Elevation (feet NGVD)	Basis for Proposed Well Depth
MW-14WT	1362.5	1697.8	1243.8	1220	1160	1160	94	10.0	1153.0 - 1163.0	7 feet below the water table elevation
MW-15WT	974.5	1860.0	1219.3	1210	1181	1139	90	10.0	1132.0 - 1142.0	7 feet below the water table elevation
MW-16WT	546.6	1887.2	1179.2	1179	1172	1134	55	10.0	1127.0 - 1137.0	7 feet below the water table elevation
MW-16	546.6	1887.2	1179.2	1195	1172	1134	85	5.0	1117.2 - 1122.2	20 feet below bottom of MW-16WT
MW-17WT	306.0	1907.4	1199.9	1180	1162	1132	78	10.0	1125.0 - 1135.0	7 feet below the water table elevation

Notes:
- Actual boring locations and depths may change due to field conditions.

Figures

Figure 1 – General Site Map
Figure 2 – Expansion Area Existing Conditions and Site Map
Figure 3 – Preliminary Subbase Grades and Conceptual Grading Plan
Figure 4 – Weathered Bedrock Contour Map
Figure 5 – Competent Bedrock Contour Map
Figure 6 – Water Table Contour Map
Figure 7 – Proposed Soil Borings, Wells, and Piezometer Locations

PLOTTED: 12/9/2021 5:50:43 PM
MODIFIED: 12/9/2021 5:46:18 PM
USER: TROMANKO

GENERAL NOTES:

1. BASE MAP UPDATED WITH MOST RECENT SURVEY WITHIN WASTE LIMITS PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.
2. CONTOUR INTERVAL IS 10-FOOT.

LEGEND:

- PROPERTY LINE
- EXISTING WASTE LIMITS
- EXISTING CLAY LIMITS
- PROPOSED WASTE LIMITS

CLOSED DEMOLITION LANDFILL

PROPOSED EXPANSION AREA

EXISTING MSW LANDFILL

STORAGE BUILDING

UNDERGROUND LEACHATE TANK

LEACHATE LOADOUT STRUCTURE

WASTE PROCESSING BUILDING

ABOVE GROUND LEACHATE TANK

LANDFILL ENTRANCE

SEDIMENTATION BASIN

0 150 300
SCALE IN FEET

NO	DATE	BY	REMARKS
	12/09/2021	DRH	ISSUED FOR REGULATORY REVIEW

REVISIONS

DESIGNED: TTR	CHECKED: DRH
DRAWN: TTR	CHECKED: MGN
DATE: 12/09/2021	APPROVED: DRH

PLANS PREPARED BY:

SEH
329 JAY STREET
SUITE 301
LA CROSSE, WI 54601-4034
PHONE: 1.608.782.3161
www.sehinc.com

PLANS PREPARED FOR:

VERNON COUNTY SOLID WASTE DEPT
53705 CTH LF
VIROQUA, WISCONSIN

PROJECT/CONTRACT NO: VERNON COUNTY
SEH PROJECT NO: VERSW 157634
FILE NAME: VC157634FIG1

VERNON COUNTY LANDFILL
ALTERNATIVE GEOTECHNICAL REQUEST
VIROQUA, WISCONSIN

GENERAL SITE MAP

FIG 1

X:\IZ\VV\VERSW\157634\5-FINAL-DSGN\51-DRAWINGS\86-HEAVY\CIVIL\ALTERNATIVE GEOTECHNICAL REQUEST\SHEETS\VC157634FIG1.DWG

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X:\UZ\VV\VERSW\157634\5-FINAL-DSGN\51-DRAWINGS\86-HEAVY\CIVIL\ALTERNATIVE GEOTECHNICAL REQUEST\SHEETS\VC157634FIG2.DWG

GENERAL NOTES:

1. BASE MAP UPDATED WITH MOST RECENT SURVEY WITHIN WASTE LIMITS PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.
2. CONTOUR INTERVAL IS 2-FOOT.

LEGEND:

- EXISTING WASTE LIMITS
- EXISTING CLAY LIMITS
- PROPOSED WASTE LIMITS
- 150-FOOT DESIGN MANAGEMENT ZONE
- 300-FOOT WELL SET BACK BOUNDARY
- MW-2 — MONITORING WELL
- TP-A — TEST PIT
- TB-2 — TEST BORING
- AB-21 — ALTERNATIVE BORING
- B-6 — SOIL BORING

SCALE IN FEET: 0, 80, 160

NO	DATE	BY	REMARKS
	12/09/2021	DRH	ISSUED FOR REGULATORY REVIEW

REVISIONS

DESIGNED: TTR | CHECKED: DRH
DRAWN: TTR | CHECKED: MGN
DATE: 12/09/2021 | APPROVED: DRH

PLANS PREPARED BY:
SEH
329 JAY STREET
SUITE 301
LA CROSSE, WI 54601-4034
PHONE: 1.608.782.3161
www.sehinc.com

PLANS PREPARED FOR:
VERNON COUNTY SOLID WASTE DEPT
53705 CTH LF
VIROQUA, WISCONSIN

PROJECT/CONTRACT NO: VERNON COUNTY
SEH PROJECT NO: VERSW 157634
FILE NAME: VC157634FIG2

VERNON COUNTY LANDFILL
ALTERNATIVE GEOTECHNICAL REQUEST
VIROQUA, WISCONSIN

EXPANSION AREA EXISTING CONDITIONS AND SITE MAP

FIG 2

PLOTTED: 12/9/2021 5:52:13 PM
MODIFIED: 12/9/2021 5:46:41 PM
USER: TROMANKO

X:\LIZ\VERSW\157634\5-FINAL-DSGN\51-DRAWINGS\85-HEAVY\CIVIL\ALTERNATIVE GEOTECHNICAL REQUEST\SHEETS\VC157634FIG3.DWG

GENERAL NOTES:

1. CONTOUR INTERVAL IS 2-FOOT.
2. EXISTING CONTOURS UPDATED WITH MOST RECENT SURVEY WITHIN WASTE LIMITS PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.
3. PROPOSED CONTOURS WITHIN WASTE LIMITS REPRESENT PROPOSED CLAY SUB-BASE ELEVATIONS.
4. PROPOSED CONTOURS OUTSIDE WASTE LIMITS REPRESENT CONCEPTUAL SITE GRADING.

LEGEND:

- EXISTING WASTE LIMITS
- PROPOSED WASTE LIMITS
- 820 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 820 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR

0 80 160
SCALE IN FEET

NO	DATE	BY	REMARKS
	12/09/2021	DRH	ISSUED FOR REGULATORY REVIEW

REVISIONS

NO	DATE	BY	REMARKS

REVISIONS

DESIGNED TTR	CHECKED DRH
DRAWN TTR	CHECKED MGN
DATE 12/09/2021	APPROVED DRH

PLANS PREPARED BY:

SEH
329 JAY STREET
SUITE 301
LA CROSSE, WI 54601-4034
PHONE: 1.608.782.3161
www.sehinc.com

PLANS PREPARED FOR:

VERNON COUNTY SOLID WASTE DEPT
53705 CTH LF
VIROQUA, WISCONSIN

PROJECT/CONTRACT NO	VERNON COUNTY
SEH PROJECT NO	VERSW 157634
FILE NAME	VC157634FIG3

VERNON COUNTY LANDFILL
ALTERNATIVE GEOTECHNICAL REQUEST
VIROQUA, WISCONSIN

PRELIMINARTY SUBBASE GRADES AND CONCEPTUAL GRADING PLAN

FIG 3

3 OF 7

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GENERAL NOTES:

1. EXISTING GRADE CONTOURS SHOWN IN 10-FOOT INTERVALS FOR CLARITY. CONTOURS UPDATED WITH MOST RECENT SURVEY WITHIN WASTE LIMITS PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.
2. PROPOSED CONTOURS REPRESENT TOP OF WEATHERED BEDROCK SHOWN IN 5-FOOT INTERVALS.
3. WEATHERED BEDROCK SURFACE ESTIMATED FROM NON-ROTOSONIC BORING LOG INFORMATION AND FIELD GEOLOGIST INTERPRETATIONS.
4. WEATHERED BEDROCK SURFACE IS DEPICTING WHERE THE RESIDUUM IS BECOMING COARSER AND HIGH PERCENTAGES OF DOLOMITE FRAGMENTS ARE PRESENT.

LEGEND:

- EXISTING WASTE LIMITS
- PROPOSED WASTE LIMITS
- 820 — EXISTING MAJOR CONTOUR
- 820 — WEATHERED BEDROCK MAJOR CONTOUR
- MW-2 — MONITORING WELL
- TP-A — TEST PIT
- TB-2 — TEST BORING
- AB-21 — ALTERNATIVE BORING
- B-6 — SOIL BORING

0 80 160
SCALE IN FEET

								DESIGNED TTR	CHECKED DRH	PLANS PREPARED BY: SEH 329 JAY STREET SUITE 301 LA CROSSE, WI 54601-4034 PHONE: 1.608.782.3161 www.sehinc.com
								DRAWN TTR	CHECKED MGN	PLANS PREPARED FOR: VERNON COUNTY SOLID WASTE DEPT 53705 CTH LF VIROQUA, WISCONSIN
								DATE 12/09/2021	APPROVED DRH	PROJECT/CONTRACT NO VERNON COUNTY; SEH PROJECT NO VERSW 157634; FILE NAME VC157634FIG4
	12/09/2021	DRH	ISSUED FOR REGULATORY REVIEW							VERNON COUNTY LANDFILL ALTERNATIVE GEOTECHNICAL REQUEST VIROQUA, WISCONSIN
N0	DATE	BY	REMARKS	N0	DATE	BY	REMARKS			**WEATHERED BEDROCK CONTOUR MAP**
REVISIONS				REVISIONS						FIG 4 — 4 OF 7

X:\UZ\VV\ERSW\157634\5-FINAL-DSGN\51-DRAWINGS\85-HEAVY\CIVIL\ALTERNATIVE GEOTECHNICAL REQUEST\SHEETS\VC157634FIG4.DWG

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USER: TROMANKO

X:\UZ\VVERSW\157634\5-FINAL-DSGN\51-DRAWINGS\85-HEAVY\CIVIL\ALTERNATIVE GEOTECHNICAL REQUEST\SHEETS\VC157634FIG5.DWG

GENERAL NOTES:

1. EXISTING GRADE CONTOURS SHOWN IN 10-FOOT INTERVALS FOR CLARITY. CONTOURS UPDATED WITH MOST RECENT SURVEY WITHIN WASTE LIMITS PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.
2. PROPOSED CONTOURS REPRESENT TOP OF COMPETENT BEDROCK SHOWN IN 5-FOOT INTERVALS.
3. COMPETENT BEDROCK SURFACE ESTIMATED FROM NON-ROTOSONIC BORING LOG INFORMATION AND FIELD GEOLOGIST INTERPRETATIONS.

LEGEND:

- EXISTING WASTE LIMITS
- PROPOSED WASTE LIMITS
- 820 — EXISTING MAJOR CONTOUR
- 820 — COMPETENT BEDROCK MAJOR CONTOUR
- MW-2 — MONITORING WELL
- TP-A — TEST PIT
- TB-2 — TEST BORING
- AB-21 — ALTERNATIVE BORING
- B-6 — SOIL BORING

0 80 160
SCALE IN FEET

NO	DATE	BY	REMARKS
	12/09/2021	DRH	ISSUED FOR REGULATORY REVIEW

REVISIONS

DESIGNED: TTR	CHECKED: DRH
DRAWN: TTR	CHECKED: MGN
DATE: 12/09/2021	APPROVED: DRH

PLANS PREPARED BY:
SEH
329 JAY STREET
SUITE 301
LA CROSSE, WI 54601-4034
PHONE: 1.608.782.3161
www.sehinc.com

PLANS PREPARED FOR:
VERNON COUNTY SOLID WASTE DEPT
53705 CTH LF
VIROQUA, WISCONSIN

PROJECT/CONTRACT NO: VERNON COUNTY
SEH PROJECT NO: VERSW 157634
FILE NAME: VC157634FIG5

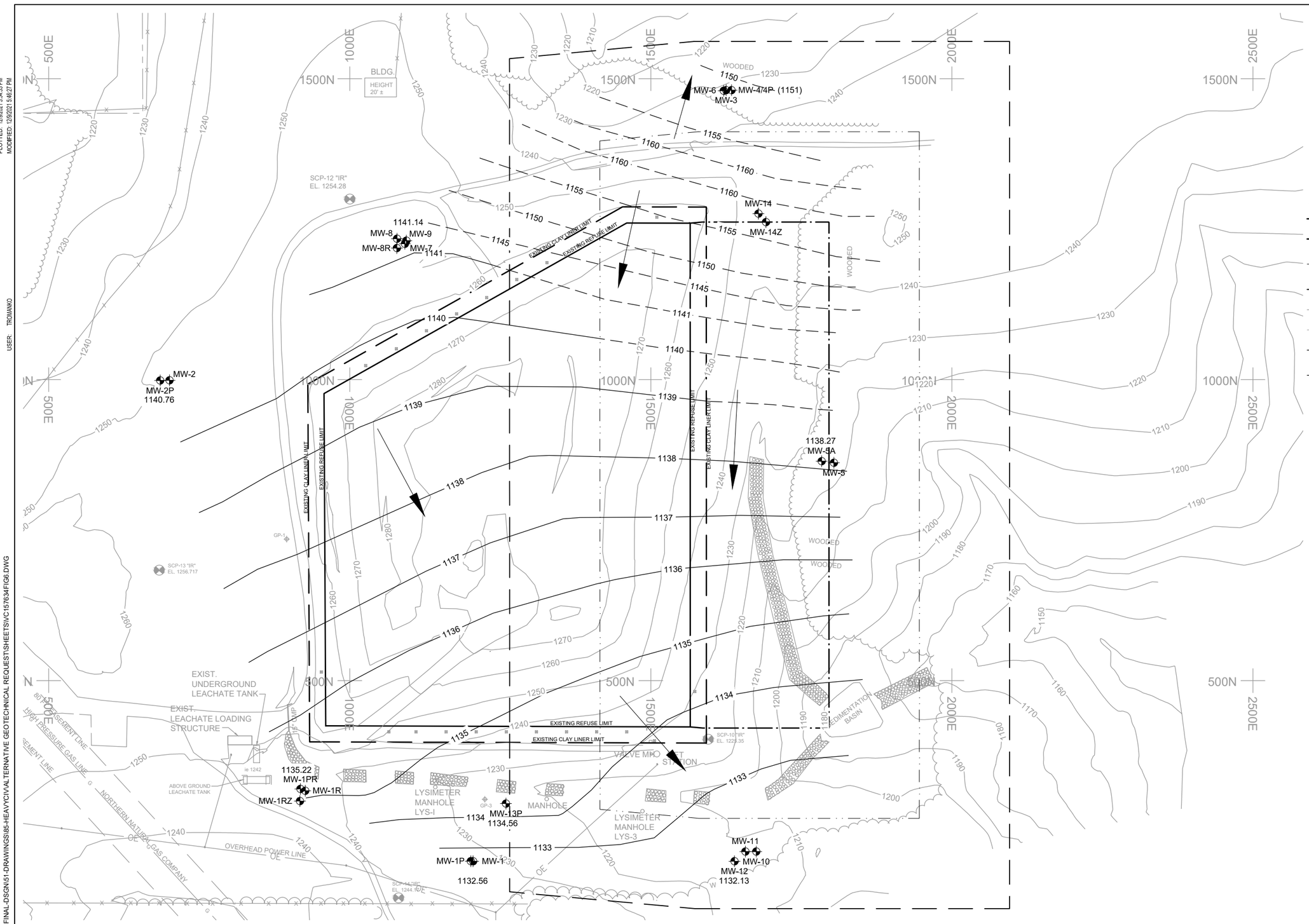
VERNON COUNTY LANDFILL
ALTERNATIVE GEOTECHNICAL REQUEST
VIROQUA, WISCONSIN

COMPETENT BEDROCK CONTOUR MAP

FIG 5
5 OF 7

PLOTTED: 12/9/2021 5:54:33 PM
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USER: TROMANKO

X:\UZ\VV\ERSW\157634\5-FINAL-DSGN\51-DRAWINGS\85-HEAVY\CIVIL\ALTERNATIVE GEOTECHNICAL REQUEST\SHEETS\VC-157634FIG6.DWG



GENERAL NOTES:

1. EXISTING GRADE CONTOURS SHOWN IN 10-FOOT INTERVALS FOR CLARITY. CONTOURS WITHIN WASTE LIMITS UPDATED WITH MOST RECENT SURVEY PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.
2. GROUNDWATER CONTOURS GENERATED FROM WATER TABLE MONITORING WELL READINGS FROM THE WDNR DATABASE IN SEPTEMBER, 2020.
3. STATIC WATER ELEVATIONS OBTAINED FROM MONITORING WELLS SCREENED AT OR NEAR THE WATER TABLE.

LEGEND:

- EXISTING WASTE LIMITS
- PROPOSED WASTE LIMITS
- 150' DESIGN MANAGEMENT ZONE
- 300' WELL SETBACK BOUNDARY
- 820 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 820 — GROUNDWATER CONTOUR
- GROUNDWATER CONTOUR (INFERRED)
- MW-2 — MONITORING WELL
- 1138.27 — STATIC WATER ELEVATION
- (1151) — ESTIMATED STATIC WATER ELEVATION

NO	DATE	BY	REMARKS
	12/09/2021	DRH	ISSUED FOR REGULATORY REVIEW

REVISIONS

NO	DATE	BY	REMARKS

REVISIONS

DESIGNED	CHECKED
TTR	DRH
DRAWN	CHECKED
TTR	MGN
DATE	APPROVED
12/09/2021	DRH

PLANS PREPARED BY:
SEH
329 JAY STREET
SUITE 301
LA CROSSE, WI 54601-4034
PHONE: 1.608.782.3161
www.sehinc.com

PLANS PREPARED FOR:
VERNON COUNTY SOLID WASTE DEPT
53705 CTH LF
VIROQUA, WISCONSIN

PROJECT/CONTRACT NO: VERNON COUNTY
SEH PROJECT NO: VERSW 157634
FILE NAME: VC157634FIG6

VERNON COUNTY LANDFILL
ALTERNATIVE GEOTECHNICAL REQUEST
VIROQUA, WISCONSIN

WATER TABLE CONTOUR MAP

FIG 6

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MODIFIED: 12/9/2021 5:45:43 PM
USER: TROMANKO

GENERAL NOTES:

1. EXISTING GRADE CONTOURS SHOWN IN 10-FOOT INTERVALS FOR CLARITY. CONTOURS UPDATED WITH MOST RECENT SURVEY WITHIN WASTE LIMITS PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.

LEGEND:

- EXISTING WASTE LIMITS
- PROPOSED WASTE LIMITS
- 150' DESIGN MANAGEMENT ZONE
- 300' WELL SETBACK BOUNDARY
- 820 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- B-21 — PROPOSED SOIL BORING
- MW-17WT — PROPOSED MONITORING WELL
- MW-1P — EXISTING MONITORING WELL

0 80 160
SCALE IN FEET

NO	DATE	BY	REMARKS
	12/09/2021	DRH	ISSUED FOR REGULATORY REVIEW

REVISIONS

DESIGNED: TTR	CHECKED: DRH
DRAWN: TTR	CHECKED: MGN
DATE: 12/09/2021	APPROVED: DRH

PLANS PREPARED BY:
SEH
329 JAY STREET
SUITE 301
LA CROSSE, WI 54601-4034
PHONE: 1.608.782.3161
www.sehinc.com

PLANS PREPARED FOR:
VERNON COUNTY SOLID WASTE DEPT
53705 CTH LF
VIROQUA, WISCONSIN

PROJECT/CONTRACT NO: VERNON COUNTY
SEH PROJECT NO: VERSW 157634
FILE NAME: VC157634FIG7

VERNON COUNTY LANDFILL
ALTERNATIVE GEOTECHNICAL REQUEST
VIROQUA, WISCONSIN

PROPOSED SOIL BORINGS, WELLS, AND PIEZOMETER LOCATIONS

FIG 7
7 OF 7

X:\AZV\VERSW\157634\5-FINAL-DSGN\51-DRAWINGS\85-HEAVY\CIV\ALTERNATIVE GEOTECHNICAL REQUEST\SHEETS\VC157634FIG7.DWG

Appendix A

Soil Boring Logs within 300-feet of Landfill Expansion

Soil Boring Logs within 300-feet of Landfill Expansion

BORING NO. MW-3

SURFACE ELEV. 1233.0

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	No Samples CORE RUN Obtained FROM	TO	CLASSIFICATION AND REMARKS Note: Logs based on drill cuttings.	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Clay, Red					
			20'				20	1213.0
			Dolomite, Broken Up With Several Crevices Between 70 and 80 ft. (1163.0 and 1153.0)				40	
							60	
			80'				80	1153.0
			Dolomite, Hard				100	
							120	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED February 1, 1988

LOCATION Klahn Site, 14+81N 16+25E

GROUNDWTR 171.38 FT BELOW GS AT ELEV. OF 1061.62

DRILLERS Ace Well Drilling

JOB NO. 57786 DATE 12/21/88

BORING NO. MW-3

SURFACE ELEV. 1233.0

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Dolomite with Crevices Between 145' and 150'					
			(1088.0 and 1083.0)				160	
			Well set at 177.70 ft. (1055.3)					
			180'				180	1053.0
			E.O.B.					
							200	
							220	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR 171.38 FT BELOW GS AT ELEV. OF 1061.62

DRILLERS

JOB NO. 57786 DATE 12/21/88

BORING NO. MW-4

SURFACE ELEV. 1232.9

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	No Samples CORE RUN Obtained FROM	TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Note: Logs based on drill cuttings.					
			Clay, Red					
			20'				20	1212.9
			Dolomite, Broken With Several Small Crevices Between 70 and 80 ft. (1162.9 and 1152.9)				40	
							60	
			80'				80	1152.90
			Dolomite, hard				100	
							120	

Note: Depth to Groundwater refers to perched water.

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED January 28, 1988

LOCATION Klahn Site 14+81N, 16+34E

GROUNDWTR 87.41 FT BELOW GS AT ELEV. OF 1145.49

DRILLERS Ace Well Drilling

JOB NO. 57786 DATE 12/21/88

BORING NO. MW-4

SURFACE ELEV. 1232.9

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Dolomite, Hard, With Several Crevices Between 145 and 150 ft. (1087.9 and 1082.9)					
			160'				160	1072.9
							180	
							200	
							220	
							50	
							55	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 57786 DATE

BORING NO. TB-4

SURFACE ELEV. 1232.9

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1	1	3		Clay, Brown, with Silt	10 YR 5/3	CL	LOESS	-	
	3	4						-	
				2.0'				-	1230.9
2	3	4		Clay, Red-Brown to Brown, with Trace Sand and Gravel	5 YR 4/4	CL	RESIDUUM	2.5 --	
	8	11						-	
3	20	17						-	
	10	19			7.5 YR 4/6	CL		5 --	
4	18	15						-	
				7.0'				-	1225.9
	25	40		Sand, Yellow, with Gravel, Clay	7.5 YR 7/6	SC		7.5 --	
				8.0'				-	1224.9
5	12	11		Clay, Dark Brown, with Sand and Gravel	7.5 YR 3/4	CL		-	
	10	25						-	
								10 --	
6	2	5						-	
	5	6						-	
				12.0'				-	1220.9
7	17	19		Weathered Dolomite	2.5 YR 8/6		WEATHERED DOLOMITE	12.5 --	
	19	20						-	
	27	80						-	
				15.0'				15 --	1217.9
				E.O.B.				-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 28, 1988

LOCATION Klahn Site

GROUNDWTR _____ FT BELOW GS AT ELEV. OF _____

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-5

SURFACE ELEV. 1221.0

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1	1	1		Silt, Brown, with Clay	10 YR 4/3		LOESS	-	
	2	2		-2.0'-				-	1219.0
2	6	5		Clay, Red-Brown, with Trace Sand and Gravel	5 YR 4/4	CL	RESIDUUM	-	
	7	8						-	
3	2	5			2.5 YR 3/4			5	
	8	10						-	
4	3	5		-7.5'-				-	1213.5
	8	15		Sand, Red-Brown, with Clay and Occasional Gravel	5 YR 5/8	SC		-	
5	5	7						-	
	13	15		-10.0'-				10	1211.0
6	8	9		Clay, Red-Brown, with Sand and Trace Gravel	7.5 YR 4/6	CL		-	
	11	13						-	
7	5	8			10 YR 7/8			-	
	11	13		-14.0'-				-	1207.0
8	8	12		Clay, Red-Brown, with Dolomite Fragments, Mottles (2.5 YR 2/0)	5 YR 4/4	CL		15	
	10	7						-	
9	10	12						-	
	18	34						-	
10	5	8						-	
	10	14			10 YR 7/8			20	
11	8	10						-	
	14	11		-22.0'-				-	1199.0
12	32	36		Sand, with Dolomite Fragments and Silt	10 YR 7/6	SM	WEATHERED DOLOMITE	-	
	27	57						-	
13	32	100		-25.0'-				25	1196.0
				E.O.B.				-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 27, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-6

SURFACE ELEV. 1218.7

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1	2	2		Clay, Brown, with Silt	10 YR 4/3	CL	LOESS	-	
				1.0'				-	1217.7
	2	4		Clay, Red-Brown, with Trace Sand	5 YR 3/2	CL	RESIDUUM	-	
2	3	6						-	
								2.5	
	7	14						-	
								-	
				4.0'				-	1214.7
3	4	5		Clay, Brown, with Trace Gravel	7.5 YR 4/4	CL		-	
	9	12						5	
				6.0'				-	
4	10	0		Clay, Red-Brown, with Sand and Occasional Gravel	5 YR 4/4	CL		-	1212.7
	10	12						-	
				8.0'				7.5	
5	5	5		Clay, Red-Brown, with Sand and Trace Gravel	5 YR 3/3	CL		-	1210.7
					5 YR 4/8			-	
6	9	21						-	
								10	
	7	10			2.5 YR 4/8			-	
								-	
7	18	19						-	
					7.5 YR 6/8			12.5	
	21	8		13.5'				-	1205.2
8	5	6		Weathered Dolomite (No Recovery)			WEATHERED DOLOMITE	-	
	7	11						15	
								-	
9	100			16.5'				-	1202.2
				E.O.B.				-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 26, 1988

LOCATION Klahn Site

GROUNDWTR _____ FT BELOW GS AT ELEV. OF _____

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-7

SURFACE ELEV. 1245.38

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1	3	4			10 YR			-	
	4	5		Clay, Brown, with Trace Sand	5/3	CL	LOESS	-	
2	4	6		and Silt	7.5 YR			-	
	10	10			4/4			-	
3	3	5			10 YR			5 --	
	6	6			3/3			-	
4	1	2						-	
	1	6			7.5 YR			-	
5	4	9			4/2			-	
	9	11		10.0'				10 --	1235.28
6	4	9		Clay, Red-Yellow, with Weathered	5 YR		RESIDUUM	-	
	9	12		Dolomite Fragments	4/6			-	
7	9	11			7.5 YR			-	
	12	10			6/8			-	
8	8	9			5 YR			15 --	
	13	12		16.0'	4/3			-	1229.28
9	5	11		Clay, Brown, with Weathered	10 YR	CL		-	
	16	19		Dolomite Fragments	6/4			-	
10	8	18			5 Y			-	
	30	24		21.0'	8/1			20 --	
11	10	26		Sand, Brown, with Clay	10 YR	SC		-	1224.28
	26	21		22.0'	4/3			-	1223.28
12	8	9		Clay, Red-Brown	7.5 YR	CL		-	
	9	11			7/8			-	
13	8	9			5 YR			25 --	
	15	17			4/4			-	
14	6	7		Mottles (10 YR 8/6)	5 YR			-	
	7	10			5/8			-	
15	4	7			10 YR			-	
	19	16			4/4			30 --	
16	9	62		31.0'	7.5 YR			-	1214.28
	27	106		Clay, Red-Brown, with Trace Gravel	4/4	CL		-	
17	43	26			2.5 YR			-	
	14	18			4/6			-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 26, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-7

SURFACE ELEV. 1245.28

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6" 6" 12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
18	11 10		5 YR 4/4			-	
19	7 13					-	
	18 17					-	
		-38.0'-				-	1207.28
		No Recovery			WEATHERED DOLOMITE	-	
20	6 8					40 --	
	10 11					-	
						-	
						-	
		-45.0'-	10 YR 6/4			45 --	1200.28
21	- -	Sand, Brown, with Rock Fragments				-	
	74 28					-	
		-47.5'-				-	1197.78
		E.O.B.				-	
						50 --	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-8

SURFACE ELEV. 1249.42

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1	2	2			10 YR			-	
	3	3		Silt, Brown, with Clay	3/2	CL	LOESS	-	
2	5	7						-	
	7	7						-	
3	3	5			7.5 YR			-	
	11	10			4/4			5 --	
				-----6.5'-----				-	1242.92
4	5	8			2.5 YR	SC	RESIDUUM	-	
	12	14		Sand, Red, with Silt and Clay	5/8			-	
5	8	10			7.5 YR			-	
	13	11			7/8			10 --	
6	5	6			5 YR			-	
	7	8		-----12.0'-----	6/8			-	
7	3	5		Weathered Dolomite, with Silt and Clay	7.5 YR			-	
	10	24		-----14.0'-----	7/8			-	1237.42
8	6	10			2.5 YR	SC		15 --	
	15	24		Sand, Red-Brown, with Clay and Gravel	4/8			-	
9	8	9			5 YR			-	
	16	17			4/6			-	
10	13	9						-	
	11	10			5 Y			20 --	
11	3	5			6/2			-	
	8	9		-----22.0'-----				-	1227.42
12	9	10		Clay, Red-Brown, with Silt, Trace Sand	5 YR	CL		-	
	11	11		-----24.0'-----	5/8			-	1225.42
13	5	10		Sand, Red-Brown, with Clay and Silt	2.5 YR	SC		25 --	
	11	11			4/6			-	
14	15	9			10 YR			-	
	7	7		-----28.0'-----	3/2			-	1221.42
15	5	6		Sand, Lt. Brown, with Gravel	10 YR	SC		-	
	11	18			7/8			30 --	
16	15	17			5 YR			-	
	7	5			5/8			-	
17	11	5			10 YR			-	
	13	9			8/3			-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 27 and 28, 1988

LOCATION Klahn Site

GROUNDWTR ____ FT BELOW GS AT ELEV. OF ____

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-8

SURFACE ELEV. 1249.42

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	5	10			10 YR 8/4			-	
19	5	1						-	
	1	1		-----38.0'-----				-	1211.42
20	3	3		Clay, Red-Brown to Dark				-	
	3	4		Brown, Trace Sand and Gravel	5 YR 3/4	CL		40 --	
21	3	2			2.5 YR 3/4			-	
	2	8		-----42.0'-----				-	1207.42
22	5	4			10 YR 6/4		WEATHERED DOLOMITE	-	
	11	10		Weathered Dolomite				-	
23	18	14		-----45.5'-----				45 --	
	18	100		E.O.B.				-	
								-	
								-	
								-	
								50 --	
								-	
								-	
								-	
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								--	
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								-	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 57786 DATE June 3, 1988

Missing other pages

BORING NO. MW-5A

SURFACE ELEV. 1224.0

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	4	3		0.5'				-	
1	6	9	15	Silt, Lt. Brown, With Clay	10 YR 6/4	ML	LOESS	-	
	7	7		3.0'				-	1221.0
2	15	12	27	Clay, Red-Brown, With Sand	5YR 4/6	CL	RESIDUUM	-	
	8	8						5	
3	7	12	19	6.0'				-	1218.0
	5	8			10 YR 7/6	SC		-	
4	12	14	26	Sand/Clay Mixture, Yellow to Red-Brown to				-	
	11	12		Brown, With Dolomite Fragments and Silt	10 YR 6/6			-	1215.0
5	9	12	21					10	
	4	8						-	
6	10	12	22		10 YR 4/3	SC		-	
	4	5						-	
7	10	13	23					-	
	6	9						15	
8	8	18	26		10 YR 4/4	SC		-	1208.5
	19	35						-	
9	8	11	19	17.5'				-	1206.5
	5	9		Weathered Dolomite With Silty Sand	10 YR 7/2		WEATHERED DOLOMITE	-	
10	15	41	56					20	
	50	-		20.5'				-	1203.5
								-	
								-	
				No Samples: Rotary Drilling				-	
								25	
								-	
								-	
								-	
								-	
								-	
								-	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 23, 1989

LOCATION Klahn 8+64N 12+58E

GROUNDWT 88.8 FT BELOW GS AT ELEV. OF 1135.18

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

BORING NO. MW-5

SURFACE ELEV. 1223.3

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	No Samples CORE RUN Obtained FROM	TO	CLASSIFICATION AND REMARKS Note: Logs based on drill cuttings.	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Clay, Red					
			20'				20	1203.3
			Dolomite With Streaks of Clay					
			35'					1188.3
			Dolomite, Broken Up, With Crevices at: 43'-44' (1179.3-1180.3) 65'-67' (1156.3-1158.3) 87'-88' (1135.3-1136.3) 93'-94' (1129.3-1130.3)				40 60 80	
			102'				100	1121.3
			Dolomite, Hard				120	
			135'					1088.3

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

* = Well was dry on 12/21/88

PROJECT Vernon County Landfill

DATE(S) DRILLED February 16, 1988

LOCATION Klahn Site 8+62N, 18+04E

GROUNDWTR * FT BELOW GS AT ELEV. OF

DRILLERS Ace Well Drilling

JOB NO. 57786 DATE 12/21/88

BORING NO. MW-5

SURFACE ELEV. 1223.3

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Dolomite, Broken Up, With Crevices at: 135' to 137' (1086.3-1088.3) 158' to 160' (1063.3-1065.3) Set Well at 158.57' (1064.73)				160	
			180' E.O.B.				180	1043.3
							200	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 57786 DATE

BORING NO. MW-6

SURFACE ELEV. 1233.0

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	No Samples CORE RUN Obtained FROM	TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Note: Logs based on drill cuttings.					
			Clay, Red.					
			14'					1219.0
			Dolomite, Broken Up With Crevices At: 23'-25' (1208.0-1210.0) 28'-29' (1204.0-1205.0)				20 40 60	
			80'				80	1153.0
			Dolomite, Fairly Consistent				100 120	

KEY

REC = PERCENT RECOVERY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED February 19, 1988

LOCATION Klahn Site, 14+80N, 16+21E

GROUNDWTR 174.15 FT BELOW GS AT ELEV. OF 1058.85

DRILLERS Ace Well Drilling

JOB NO. 57786 DATE 12/21/89

BORING NO. MW-6

SURFACE ELEV. 1233.0

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Dolomite, Fairly Consistent				160	
			180'				180	1053.0
			Dolomite, Sandy Set Well at 199.93' (1033.07)				200	
			210' E.O.B.					1023.0
							220	

KEY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR 174.15 FT BELOW GS AT ELEV. OF 1058.85

DRILLERS

JOB NO. 57786 DATE

BORING NO. MW-10

SURFACE ELEV. 1215.6

Page 1 of 6

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12 "	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	3	4		Topsoil Disturbed	10 YR			-	
1	6	7	13	0.5'	5/2		LOESS	-	
	5	6		Silt/Clay, Lt. Brown	10 YR	CL		-	
2	13	16	29	4.5'	6/6			-	1211.1
	6	6		Med. Sand, Red-Brown,	7.5YR	SC		5	
3	7	11	18	With Some Clay	5/6		RESIDUUM	-	
	4	6		7.0'	10 YR			-	1208.6
4	10	13	23	Clay/Silt, Lt. Gray-Brown,	7/1	CL		-	
	6	10		With Pebbles @ 9.0'	7.5YR			-	
5	12	20	32	9.5'	5/6			10	1206.1
	7	9		Med. Sand, Red-Brown,	7.5YR	SC		-	
6	13	19	32	With Some Clay	5/8			-	
	12	16						-	
7	24	25	49	14.5'				-	1201.1
	11	23						15	
8	18	19	37	Med. Sand, Tan to Brown,	10 YR	SC		-	
	5	22		With Clay	6/4			-	
9	29	20	49	18.0'				-	1197.6
	10	15		Med. Sand, Yellow to Lt. Brown	10 YR			-	
10	16	21	37	to Red-Brown,	7/8	SP-SM		20	
	10	15		With Silt, Trace Clay	10 YR			-	
11	19	24	43		6/4			-	
	17	12						-	
12	11	12	23	24.5'				-	1191.1
	50	-	-	continued on page 2 of 6			WEATHERED DOLOMITE	25	
								-	
								-	
								-	
								-	
								-	
								-	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 24, 1989

LOCATION Klahn Site 2+16N 16+57E

GROUNDWT 145.47 FT BELOW GS AT ELEV OF 1070.13

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			No Samples - Poor Quality Dolomite w/Clay Residuum				30	
							35	
							40	
							45	
							50	
							55	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE Jan. 5, 1990

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			61.0					1154.6
1	61	66.5	Dolomite, With Occasional Small Vugs	18%	2.02	6.4%	65	
2	66.5	71.5		0%	-	-	70	
			71.5					1144.1
3	71.5	74.0	Poorly Consolidated Silty Sandstone	0%	-	0%		
			74.0					1141.6
4	76.5	80.0	Dolomite, With Occasional Small Vugs	75%	1.52	59%	75 80	
5	80	89		52%	3.2	17%	85	
6	89	99.5		100%	2.1	77%	90	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
7	99.5	106.8	100'	90%	3.03	51.6%	100	1115.6
			Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds					
8	106.8	110.5	106.0	100%	1.1	100%	105	1109.6
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds				110	
9	110.5	120.5		100%	1.3	93%	115	
							120	
10	120.5	129.3		90%	1.3	80%	125	

KEY

REC = PERCENT RECOVERY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
11	129.3	133		18%	6.0	0%		
			134					1081.6
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds; Numerous Small Vugs				135	
12	133	140.5		100%	2.3	63%		
			139.0					1076.6
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds; Few to No Vugs.				140	
13	140.5	150.5		100%	1.5	82%	145	
14	150.5	155.2		100%	0.9	96%	150	
			155.5				155	
15	155.2	157.5	Dolomitic Sandstone, Brown	100%	1.3	83%		1060.1
			157.5					1058.1
			Sandy Dolomite With Occasional Sandstone and Gray-Green Shale Interbeds				160	
16	157.5	167		100%	1.7	73%		
			163.0					1052.6

KEY

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Dolomitic Sandstone With Occasional Gray-Green Shale Interbeds					1048.6
			167.0					
17	167	177	Sandy Dolomite and Dolomitic Sandstone With Occasional Gray-Green Shale Interbeds	100%	2.2	73%	170	
			172.5					1043.1
			Sandstone, Brown, Fine to Medium Grained With Occasional Cross Beds				175	
18	177	181		100%	2.0	79%		
			178.5					1037.1
			Dolomitic Sandstone With Some Sandy Dolomite				180	
			181.0					1034.6
			E.O.B.					
							185	

KEY

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-11

SURFACE ELEV. 1216.4

Page 1 of 5

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	3	4		Topsoil Disturbed	10 YR			-	
1	6	7	13	-0.5'-	5/2		LOESS	-	
	5	6		Silt/Clay, Lt. Brown	10 YR	CL		-	
2	13	16	29	-4.5'-	6/6			-	1211.1
	6	6		Med. Sand, Red-Brown,	7.5YR	SC		5 --	
3	7	11	18	With Some Clay	5/6		RESIDUUM	-	
	4	6		-7.0'-	10 YR			-	1208.6
4	10	13	23	Clay/Silt, Lt. Gray-Brown,	7/1	CL		-	
	6	10		With Pebbles @ 9.0'	7.5YR			-	
5	12	20	32	-9.5'-	5/6			10 --	1206.1
	7	9		Med. Sand, Red-Brown,	7.5YR	SC		-	
6	13	19	32	With Some Clay	5/8			-	
	12	16						-	
7	24	25	49	-14.5'-				-	1201.1
	11	23						15 --	
8	18	19	37	Med. Sand, Tan to Brown,	10 YR	SC		-	
	5	22		With Clay	6/4			-	
9	29	20	49	-18.0'-				-	1197.6
	10	15		Med. Sand, Yellow to Lt. Brown	10 YR			-	
10	16	21	37	to Red-Brown,	7/8	SP-SM		20 --	
	10	15		With Silt, Trace Clay	10 YR			-	
11	19	24	43		6/4			-	
	17	12						-	
12	11	12	23	-24.5'-				-	1191.1
	50	-	-	continued on page 2 of 5			WEATHERED DOLOMITE	25 --	
								-	
								-	
								-	
								--	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 24, 1989

LOCATION Klahn Site 2+16N 16+57E

GROUNDWT 145.47 FT BELOW GS AT ELEV OF 1070.13

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			No Samples - Poor Quality Dolomite w/Clay Residuum				30	
							35	
							40	
							45	
							50	
							55	

KEY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE Jan. 5, 1990

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			61.0					1154.6
1	61	66.5	Dolomite, With Occasional Small Vugs	18%	2.02	6.4%	65	
2	66.5	71.5		0%	-	-	70	
			71.5					1144.1
3	71.5	74.0	Poorly Consolidated Silty Sandstone	0%	-	0%		
			74.0					1141.6
4	76.5	80.0	Dolomite, With Occasional Small Vugs	75%	1.52	59%	75	
5	80	89		52%	3.2	17%	80	
6	89	99.5		100%	2.1	77%	85	
							90	

KEY

REC = PERCENT RECOVERY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
							-	
							-	
							-	
7	99.5	106.8		90%	3.03	51.6%	-	
			100'				100 --	1115.6
			Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds				-	
							-	
							-	
							-	
							105 --	
8	106.8	110.5	106.0	100%	1.1	100%	-	1109.6
							-	
							-	
							-	
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds				110 --	
							-	
							-	
9	110.5	120.5		100%	1.3	93%	-	
							115 --	
							-	
							-	
							-	
							-	
							120 --	
							-	
							-	
10	120.5	129.3		90%	1.3	80%	-	
							-	
							125 --	
							-	
							-	
							-	
							-	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
11	129.3	133		18%	6.0	0%	-	
							-	
							-	
			134				-	1081.6
			Sandy Dolomite, With Occasional Sandstone and				135 --	
12	133	140.5	Gray-Green Shale Interbeds; Numerous Small Vugs	100%	2.3	63%	-	
							-	
			139.0				-	1076.6
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds; Few to No Vugs.				140 --	
13	140.5	150.5		100%	1.5	82%	-	
							145 --	
							-	
							-	
							-	
							-	
							150 --	
14	150.5	155.2		100%	0.9	96%	-	
							-	
							-	
							-	
			155.5				155 --	
15	155.2	157.5	Dolomitic Sandstone, Brown	100%	1.3	83%	-	1060.1
							-	
			157.5				-	1058.1
			Sandy Dolomite With Occasional Sandstone and Gray-Green				-	
							160 --	
16	157.5	167	Shale Interbeds	100%	1.7	73%	-	
							-	
			163.0				----- -	1052.6
			End of Boring - Set Well				-	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-12

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	3	4		Topsoil Disturbed	10 YR			-	
1	6	7	13	-0.5'-	5/2		LOESS	-	
	5	6		Silt/Clay, Lt. Brown	10 YR	CL		-	
2	13	16	29	-4.5'-	6/6			-	1211.1
	6	6		Med. Sand, Red-Brown,	7.5YR	SC		5 --	
3	7	11	18	With Some Clay	5/6		RESIDUUM	-	
	4	6		-7.0'-	10 YR			-	1208.6
4	10	13	23	Clay/Silt, Lt. Gray-Brown,	7/1	CL		-	
	6	10		With Pebbles @ 9.0'	7.5YR			-	
5	12	20	32	-9.5'-	5/6			10 --	1206.1
	7	9		Med. Sand, Red-Brown,	7.5YR	SC		-	
6	13	19	32	With Some Clay	5/8			-	
	12	16						-	
7	24	25	49	-14.5'-				-	1201.1
	11	23						15 --	
8	18	19	37	Med. Sand, Tan to Brown,	10 YR	SC		-	
	5	22		With Clay	6/4			-	
9	29	20	49	-18.0'-				-	1197.6
	10	15		Med. Sand, Yellow to Lt. Brown	10 YR			-	
10	16	21	37	to Red-Brown,	7/8	SP-SM		20 --	
	10	15		With Silt, Trace Clay	10 YR			-	
11	19	24	43		6/4			-	
	17	12						-	
12	11	12	23	-24.5'-				-	1191.1
	50	-	-	continued on page 2 of 4			WEATHERED DOLOMITE	25 --	
								-	
								-	
								-	
								--	
								-	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 24, 1989

LOCATION Klahn Site 2+16N 16+57E

GROUNDWT 145.47 FT BELOW GS AT ELEV OF 1070.13

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

BORING NO. MW-12

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			No Samples - Poor Quality Dolomite w/Clay Residuum				30	
							35	
							40	
							45	
							50	
							55	

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REC = PERCENT RECOVERY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE Jan. 5, 1990

BORING NO. MW-12

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			61.0					1154.6
			Dolomite, With Occasional Small Vugs					
1	61	66.5		18%	2.02	6.4%	65	
2	66.5	71.5		0%	-	-	70	
			71.5					1144.1
			Poorly Consolidated Silty Sandstone					
3	71.5	74.0		0%	-	0%		
			74.0					1141.6
							75	
4	76.5	80.0	Dolomite, With Occasional Small Vugs	75%	1.52	59%		
							80	
5	80	89		52%	3.2	17%	85	
6	89	99.5		100%	2.1	77%	90	

KEY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. TB-15

SURFACE ELEV. 1193.5

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	4	8		Topsoil Disturbed	10 YR			-	
1	10	16	26	-0.5'-	6/2			-	
	6	12		Clay, Lt. Brown to Brown, With Silt	10 YR	CL	LOESS	-	
2	22	27	49	-3.5'-	6/4			-	1190.0
	5	9						5 --	
3	14	14	28	Clay, Lt. Brown to Brown,	5 YR	CL	RESIDUUM	-	
	10	6		with Dolomite Fragments	4/4			-	
4	8	9	17	and Occasional Sandy Layers				-	1185.5
	5	8			7.5YR	CL		-	
5	10	50	60		5/6			10 --	
	30	23		-11.5'-				-	
6	14	13	27	Weathered Dolomite			WEATHERED	-	1182.0
				-12.0'-			DOLOMITE	-	1181.5
				E.O.B.				-	
								15 --	
								-	
								-	
								-	
								-	
								20 --	
								-	
								-	
								-	
								-	
								25 --	
								-	
								-	
								-	
								-	
								--	
								-	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 24, 1989

LOCATION Klahn Site 3+85N 16+51E

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 5-92

Facility/Project Name *Vernon Co. Balefill*			**License/Permit/Monitoring Number** *03268*	**Boring Number** *MW-14*	
Boring Drilled By (Firm name and name of crew chief) *Traut Hydro Tech* *Daryl Karasch*			**Date Drilling Started** *03/10/2003*	**Date Drilling Completed** *03/12/2003*	**Drilling Method** *Versa Sonic*
DNR Facility Well No. *118*	**WI Unique Well No.** *JX072*	**Common Well Name** *MW-14*	**Final Static Water Level** *1066.87 Feet MSL*	**Surface Elevation** *1247.5 Feet MSL*	**Borehole Diameter** *7.0" inches*
Boring Location **State Plane** *N, E* *SW 1/4, SE 1/4, Sec. 15, T13N, R4E*			**Lat** *43 / 35' / 49.49"* **Long** *90 / 4.' / 14.85"*	**Local Grid Location (if applicable)** *1275.90 Feet* ***N*** *1678.68 Feet* ***E***	
County *Vernon*			**DNR County Code** *63*	**Civil Town/City/ or Village** *Viroqua*	

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			2 4 6 8 10 12 14 16 18 20 22	See Boring Log for MW-14Z										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Peter D Trautsen Firm Central Wisconisn Engineers & Architects

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			26											
			28											
			30											
			32											
			34											
			36											
			38											
			40											
			42											
			44											
			46											
			48											
			50											
			52											
			54											
			56											
			58											
			60											
			62											

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			66											
			68											
			70											
			72											
			74											
			76											
			78											
			80											
			82											
			84											
			86											
			88											
			90											
			92											
			94											
			96											
			98											
			100											
			102											

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			106											
			108											
			110											
			112											
			114											
			116											
			118											
			120											
			122											
			124											
			126											
			128											
			130											
			132											
			134											
			136											
			138											
			140											
			142											

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			146											
			148											
			150											
			152											
			154											
			156											
			158											
			160											
			162											
			164											
			166											
			168											
			170											
			172											
			174											
			176											
			178											
			180											
			182											

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			186											
			188											
			190											
				E.O.B. @ 190'										
			192											
			194											
			196											
			198											
			200											
			202											
			204											
			206											
			208											
			210											
			212											
			214											
			216											
			218											
			220											
			222											

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	MW-14Z

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Traut Hydro Tech Daryl Karasch	03/05/2003	03/07/2003	Versa Sonic

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
119	JX073	MW-14Z	1067.07 Feet MSL	1247.5 Feet MSL	7.0 inches

Boring Location State Plane N, E	Lat / Long	Local Grid Location (if applicable)
SW 1/4, SE 1/4, Sec. 15, T13N, R4E	Lat 43 / 35' / 49.49" Long 90 / 43' / 14.85"	1261.80 Feet N 1691.28 Feet E

County	DNR County Code	Civil Town/City/ or Village
Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	10/10		2-4-6	Yellowish brown clayey silt, little sand (Loess)	CL			10YR 5/8						
			6-8	Reddish brown sandy clayey silt	CL			10YR 6/8						
			8-10-12	Red, yellow, brown silty sand w/varying amounts of clay	SC			7.5YR 6/8						
	10/10		12-14-16		SM			10YR 7/8						
			16-18-20	Red, yellow, brown sandy, clayey silt	CL			10YR 5/8						
	10/10		20-22		SM			10YR 7/8						

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Peter D Arntzen Firm Central Wisconisn Engineers & Architects

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Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	10/10		26–28	Red, yellow, brown silty sand w/varying amounts of clay	SM			10YR 7/8						
	9/10		30–40											
	8/10		40–42	Yellow, red, brown sandy, clayey silt w/little gravel	CL			10YR 6/8						
			42–44											
			44–46	Brown sandy clayey silt and silty clay w/little gravel										
			46–48		CH			10YR 4/4						
			48–50											
	6/10		50–52		SM			10YR 7/4						
			52–54	Yellowish brown silty sand w/varying amounts of clay and occasional clay lenses										
			54–56		SP/SM									
			56–58											
			58–60		SM									
	8/10		60–62		SC									

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	8/10		66–70	Brown silty clayey sand and sandy, clayey silt, little to trace gravel	SC / CL									
	10/10		72–80	Grayish brown silty sand, little to trace clay and occasional coarse gravel	SM			10YR 7/4						
	10/10		84–90		ML			10YR 6/8						
	10/10		96–100	Same, but with increasing coarse gravel	GM									
	9/10		102	Dolomite, occasional small vugs	Bdrk									Rec: 81%

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	9/10		106 108 110	(Highly fractured zone @ 110' – 111')										FF: 5.6/ft RQD: 4%
	9/10		112 114 116 118	(Highly fractured zone @ 118' – 120')										Rec: 75% FF: 5.1/ft RQD: 0%
	10/10		120 122 124 126		Bdrk									Rec: 94% FF: 3.5/ft RQD: 41%
			128	Sandy Dolomite										
			130	Dolomite										
	10/10		132 134 136 138	Sandy Dolomite with Grey-Green Shale and Sandstone Interbeds										Rec: 97% FF: 2.6/ft RQD: 69%
	9/10		140 142	Dolomite, occasional small vugs (Highly fractured zone @ 142' – 143')										Rec: 69%

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	9/10		146 148 150		Bdrk									FF: 4.4/ft RQD: 17%
	9/10		152 154 156	(Highly fractured zone @ 154' – 156')										Rec: 81% FF: 5.9/ft RQD: 0%
	9/10		158 160 162 164 166	(Highly fractured zone @ 158' – 159') Dolomite, occasional small vugs										Rec: 87% FF: 4.1/ft RQD: 31%
	8/10		168 170 172 174 176	(Highly fractured zone @ 175'– 177')										Rec: 72% FF: 4.6/ft RQD: 18%
	8/10		178 180 182	Sandy siltstone Dolomite										Rec: 65%

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	8/10		186	(Highly fractured zone @ 183'–186')	Bdrk									FF: 4.8/ft RQD: 13%
			188	Sandy dolomite and dolomitic sandstone										
			190											
	6/10		192	(Highly fractured zone @ 191'–195')										Rec: 56% FF: 5.0/ft RQD: 4%
			194											
			196											
			198	(Highly fractured zone @ 198'–199')										
	6/10		200											Rec: 49% FF: 5.1/ft RQD: 18%
			202											
			204											
			206											
			208	Silty, dolomitic sandstone with shale partings										
			210	E.O.B. @ 210'										
			212											
			214											
			216											
			218											
			220											
			222											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-15

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,252.9 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W

Lat 90° 50' 375.0"
Long 43° 35' 934.0"

Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	TOPSOIL	OL									
				Brown, sandy, LEAN CLAY, little gravel										
			2.5											
2 AU			5.0											
			7.5		CL									
3 AU			10.0											
			12.5											
4 AU			15.0	Brown, LEAN CLAY, some sand, little gravel, occasional hard pan layers										
			17.5											
5 AU			20.0											
			22.5		CL									
6 AU			25.0											
			27.5											
			30.0											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature John E. Stalf | Firm Short Elliot Henrickson Inc. | Tel: Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-15 Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel, occasional hard pan layers *(continued)*										
8 AU			35.0		CL									
			37.5											
9 AU			40.0	BEDROCK, dolomite										
			42.5		BR									
			45.0	**Boring Refusal at 45 feet.** Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-17

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,238.8 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat 90° 50' 363.0"
Long 43° 35' 955.0"
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some fine sand, layers of numerous cobbles and gravel										
2 AU			5.0											
			7.5											
3 AU			10.0											
			12.5											
4 AU			15.0		CL									
			17.5											
5 AU			20.0											
			22.5											
6 AU			25.0											
			27.5	BEDROCK, likely dolomite	BR									
			30.0											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
John E. Hall	Short Elliot Henrickson Inc.	Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-17 Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 AU			32.5	BEDROCK, likely dolomite *(continued)*	BR									
8 AU			35.0											
			37.5	**Boring Refusal at 39 feet.** Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

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Soil Boring Logs outside 300-feet of Landfill Expansion

BORING NO. MW-1

SURFACE ELEV. 1236.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	No Samples CORE RUN Obtained FROM	TO	CLASSIFICATION AND REMARKS Note: Logs based on drill cuttings.	REC (%)	FF	ROD (%)	DEPTH	ELEV. (ft.)
			Clay, Red				20	
			28'					1208.4
			Dolomite - Broken Up					
			38'					1198.4
			Dolomite, Broken Up, With Some Streaks of Clay				40 60	
			80'				80	1156.4
			Dolomite, Hard				100 120	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

ROD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED December 29, 1987

LOCATION Klahn Site, 2+00N, 12+01E

GROUNDWTR 154.84 FT BELOW GS AT ELEV. OF 1081.56

DRILLERS Ace Well Drilling

JOB NO. 57786 DATE 12/21/88

BORING NO. MW-1

SURFACE ELEV. 1236.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Crevice From 145' to 148' (1091.4 to 1088.4)					
			Set Well at 156.26' (1080.14)					1080.14
							160	
							180	
			200'				200	1036.4
			E.O.B.					
							220	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR 154.84 FT BELOW GS AT ELEV. OF 1081.56

DRILLERS

JOB NO. 57786 DATE 12/21/88

BORING NO. MW-2

SURFACE ELEV. 1252.5

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	No Samples CORE RUN obtained FROM	TO	CLASSIFICATION AND REMARKS Note: Logs Based on Drill Cuttings	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Clay, Red				20	
			30'					1222.5
			Dolomite With Clay Streaks					
			40'				40	1212.50
			Dolomite, Hard					
			60'				60	1192.5
			Dolomite - Broken Up With Crevice From 95' - 96'					
			(1156.50 to 1157.50)				80	
			100'				100	1152.5
			Dolomite, Hard, With Occasional Soft Zones.					
							120	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED Jan. 12 and Jan. 16, 1988

LOCATION Klahn Site 9+99N, 7+03E

GROUNDWTR 169.08 FT BELOW GS AT ELEV. OF 1083.42

DRILLERS Ace

JOB NO. 57786 DATE 12/21/88

BORING NO. MW-2

SURFACE ELEV. 1252.5

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Dolomite, Hard, With Occasional Soft Zones				160	
			Well Set at 172.73' (1079.77)				180	
			190'					1062.50
							200	
							220	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR 169.08 FT BELOW GS AT ELEV. OF 1083.42

DRILLERS

JOB NO. 57786 DATE 12/21/88

BORING NO. MW-7

SURFACE ELEV. 1255.7

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	4	4		Topsoil					
				1.0	10 YR				
1	4	4	8	Clay, Light Brown to Gray-Brown,	4/4	CL	LOESS		
2	6	6		with Silt					
3	11	22	33						
4	8	4			10 YR			5	1250.7
5	4	6	10		5/6	CL			
6	5	32		7.0					1248.7
7	14	19	33						
9	6	5		Clay, Red-Brown to Yellow, With Red Sand	2.5 YR		RESIDUUM		
10	5	7	12	10.5	4/6	SC		10	1245.2
12	7	17							
	27	20	47						
13	2	3		Clay, Red-Brown, With					
	7	8	15	Occasional Silt and Sand	10 YR				
14	30	35			3/3	CL		15	
15	25	27	52						
	17	27							
	21	2	23						
	3	3							
16	6	7	13					20	
17	11	28		21.5					1234.20
	19	17	36				WEATHERED		
	95	33		continued on page 2 of 7			DOLOMITE		
	10	35	45						
19	31	28						25	
	20								

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED July 6, 1989

LOCATION Klahn Site, 12+31N, 10+94E

GROUNDWTR 193.9 FT BELOW GS AT ELEV. OF 1061.84

DRILLERS Exploration Technology

JOB NO. 70389 DATE Dec. 22, 1989

BORING NO. MW-7

SURFACE ELEV. 1255.7

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
1	25'	26'		20%	?	0%		
2	26'	27'	Weathered Dolomite With Interspersed Red Clay	80%	6-10	0%		
3	27'	30'	Residuum	50%	?	0%	30	
4	30'	32.5'		25%	?	0%	35	
5	32.5'	40'		0.0%	-	0%	40	
			44'					1211.70
6	44'	47.5'	Dolomite, With Occasional Small Vugs and Chert	86%	2.0	57%	45	
7	47.5'	50.0'		88%	2.0	62%	50	
8	50.0'	52.0'		60%	2.5	40%	55	
9	52.0'	60.0'		74%	1.0	63%		
			58'					1197.70

KEY

REC = PERCENT RECOVERY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-7

SURFACE ELEV. 1255.7

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			4" Brown Clay Seam					
			Dolomite, With Occasional Large Vugs				65	
10	60'	70'		70%	1.7	53%	70	
			72.0					1183.70
			Dolomite, With Occasional Small Vugs				75	
11	70'	80'		73%	1.2	52%	80	
					5.0		85	
12	80'	90'		67%	3-5	28%	90	

KEY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-7

SURFACE ELEV. 1255.7

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
13	90'	100'		48%	1-5	20%		
							100	1155.7
14	100'	103'	(1.5 ft. Weathered Zone With Red-Brown Clay)	66%	-	0%		
							105	
15	103'	110'		86%	3.8	39%		
							110	
			Dolomite, With Occasional Small Vugs					
							115	
16	110'	120'		100%	2.4	64%		
							120	
17	120'	127'						
				100%	3.8	34%	125	
			(3" White Silty Clay Seam)					
18	127'	135'	130'	100%	1.1	90%		1125.70

KEY

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-7

SURFACE ELEV. 1255.7

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Sandy Dolomite, With Occasional Gray-Green Shale Interbeds; Few to No Vugs				135	
19	135'	145'		100%	1.9	70.0%	140	
							145	
			148'					1107.7
20	145'	155'	Dolomite, With Occasional Sandy To Shaly Interbeds; Few Small Vugs	100%	2.1	73.3%	150	
			153'					1102.7
			Sandy Dolomite					
			155'				155	1100.7
21	155	160	Dolomite, With Occasional Sandy to Shaly Interbeds; Few Small Vugs	100%	2.4	59%	160	
22	160'	170'		70%	1.57	54.5%		

KEY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-7

SURFACE ELEV. 1255.7

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			169'					1086.7
							170	
23	170'	175'		70%	2.86	19%		
			Sandy Dolomite, With					
			Occasional Brown Sandstone				175	
24	173.5	180.5	Interbeds; Few to No Vugs	53%	1.6	23%		
							180	
25	180.5	188.5						
				88%	4.2	16%		
							185	
			186.5					1069.2
			Sand, Brown, Med-Fine					
			188.5					1067.2
							190	
			Dolomite, With Occasional					
			Sandy to Shaly Interbeds					
26	188.5	198.5	193	100%	1.4	76.5		1062.7
			Sandy Dolomite With				195	
			Occasional White to Brown Sandstone and					
			Gray-Green Shale Interbeds;					
			Few to No Vugs					

KEY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-7

SURFACE ELEV. 1255.7

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
							-	
							-	
							-	
							-	
			(206'-207', Sandstone, White With				205 --	
27	198.5	209	Gray-Green Shale Interbeds)	76%	1.13	63%	-	1049.7
							-	
							-	
			-209'-				-	1046.7
							210 --	
			End of Coring				-	
							-	
							-	
							-	
							215 --	
							-	
							-	
							-	
							-	
							220 --	
							-	
							-	
							-	
							-	
							225 --	
							-	
							-	
							-	
							-	
							230 --	
							-	
							-	
			-234.5-				-	
			End of Boring - Set Well				-	1021.2

KEY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. TB-1

SURFACE ELEV. 1234.93

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
				Clay, Brown with Trace Silt	10 YR 4/3	CL	LOESS		
								2.5	
					7.5 YR 3/4				
2	3	3						5	
	5	7			7.5 YR 4/4				
3	4	4							
								7.5	
	6	10							
4	3	7							
				9.5'					1225.43
	12	14		Clay, Red-Brown, with Sand, Trace Gravel	5 YR 4/4	CL	RESIDUUM	10	
				10.5'					1224.43
5	3	14		Sand, Brown, with Clay, Trace Silt	7.5 YR 4/4	SC			
	11	10			10 YR 6/4	SC		12.5	
6	3	11		13.0'					1221.93
				Clay, Red-Brown, with Weathered Dolomite Fragments	5 YR 4/6	CL			
	18	23							
7	20	34						15	
	18	31			10 YR 6/3				
8	100			17.0'					1217.93

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 25 and 26, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-2

SURFACE ELEV. 1252.66

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1	2	2		Clay, Brown, with Silt, Trace Sand	10 YR 5/4	CL	LOESS	-	
	3	4						-	
2	14	12			7.5 YR 3/4			-	
	31	26		4.0'				-	1248.66
3	100			Clay, Red-Brown, with Trace Sand and Gravel	5 YR 4/4	CL	RESIDUUM	5	
4	41	93						-	
	59	29			2.5 YR 3/6			-	
5	7	11						-	
	12	11		9.0'	7.5 YR 7/8	SC		-	1243.66
6	4	7		Sandy Clay				10	1242.66
	9	7		10.0'	5 YR 4/4	CL		-	
7	2	4		Clay, Brown to Red-Brown, with Trace Sand and Occasional Trace Gravel				-	
	6	9			2.5 YR 4/6			-	
8	5	10						-	
	7	7			7.5 YR 4/4	CL		15	
9	3	16						-	
	18	13		17.0'	10 YR 6/4		WEATHERED DOLOMITE	-	1235.66
10	41	67		Weathered Dolomite	2.5 YR 8/6			-	
	100			19.5'				20	1233.16
				E.O.B.				-	
								-	
								-	
								-	
								25	
								-	
								-	
								-	
								-	
								-	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 28, 1988

LOCATION Klahn Site

GROUNDWTR _____ FT BELOW GS AT ELEV. OF _____

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-3

SURFACE ELEV. 1253.35

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1	2	3		Clay, Brown, with Silt	10 YR 5/3	CL	LOESS	-	
	3	5		1.5'				-	1251.85
2	7	12		Clay, Red-Brown to Brown, with Sand and Occasional Gravel	5 YR 4/4	CL	RESIDUUM	2.5	
	10	12						-	
3	9	12						-	
	14	12						5	
4	8	7			5 YR 4/6	CL		-	
	8	7			7.5 YR 4/4			7.5	
5	7	6		8.5'				-	1244.85
	12	11		2" Layer of Fine to Medium Sand	10 YR 8/4			-	
6	4	8		Clay, Brown, with Trace Sand and Gravel, Mottles (10 YR 8/8)	10 YR 4/4	CL		10	
	12	13						-	
7	10	14			7.5 YR 3/2			12.5	
	15	52		13.0'				-	1240.35
				Sand, with Clay, Trace Gravel	7.5 YR 4/4	SC		-	1239.35
8	100			14.0' Weathered Dolomite	2.5 YR 8/4		WEATHERED DOLOMITE	-	1238.85
				14.5' E.O.B.				15	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 28, 1988

LOCATION Klahn Site

GROUNDWTR _____ FT BELOW GS AT ELEV. OF _____

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-9

SURFACE ELEV. 1236.19

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1				Clay, Dark Brown, with Silt	10 YR 4/3 7.5 YR 4/4 7.5 YR 3/4	CL	LOESS	5	
				7.5'					1228.69
2				Clay, Red-Brown, with Sand	5 YR 4/4	CL	RESIDUUM		
				9.0'					1227.19
3				Sand, Lt. Brown, with Clay	10 YR 7/3	SC		10	1226.19
				10.0'					
4	26	20		Sand, Lt. Brown, with Silt, Clay and Gravel	10 YR 6/3 10 YR 3/6	SM		15	
	18	14			5 YR 3/4				
5	9	10			10 YR 6/2				
	21	15			2.5 YR 3/4			20	
6	15	11							
	10	32		22.0'					1214.19
				E.O.B.				25	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 25, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-10

SURFACE ELEV. 1258.8

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	5	5		Topsoil	10 YR			-	
1	8	9	17	0.5'	6/2			-	
	2	6						-	
2	7	7	14	Clay, Gray to Lt. Brown, With Silt	2.5YR	CL	LOESS	-	
	5	11			7/4			-	
3	29	9	38	6.0'				5	
	5	17		Clay, Red-Brown to Gray-Brown, With Silt and Fine Sand				-	1252.8
4	10	18	28		7.5YR	CL	RESIDUUM	-	
	2	8			7/4			-	
5	25	37	62	10.0'				-	
	8	11		Clay, Lt. Brown to Yellow-Brown, With Silt, Dolomite Fragments				10	1248.8
6	11	12	23		7.5YR	CL		-	
	6	10			5/6			-	
7	10	9	19					-	
	7	26						-	
								15	
8	37	69	109	16.0'	10 YR	CL		-	1242.8
	11	7		Med. Sand, Yellow-Brown, With Silt, Dolomite Fragments	6/6			-	
9	9	100	109	18.0				-	1240.8
	39	9		E.O.B. Rock				-	
10	7	7	14					-	
								20	
								-	
								-	
								-	
								-	
								25	
								-	
								-	
								-	
								-	
								-	
								-	
								-	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 15, 1989

LOCATION Klahn Site 10+13N 9+25E

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

BORING NO. TB-11

SURFACE ELEV. 1253.9

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	3	4		Topsoil	10 YR				
1	5	9	14	0.5'	7/2				
	3	5		Clay, Lt. Brown, with Silt		CL	LOESS		
2	6	10	16						
	10	11							
3	8	13	21					5	
	5	11		6.0'					1247.9
				Clay, Red-Brown to Yellow-Brown, with Silt and Occasional Sandy Layers	5 YR 6/6	CL	RESIDUUM		
4	10	13	23						
	7	11							
5	12	14	26						
	5	7						10	
6	58	26	84	Dolomite Fragments at 12'	7.5YR 5/8	CL			
	7	33							
7	31	14	45						
	7	12		15.0'					1238.9
8	13	13	26					15	
	5	16		Weathered Dolomite with Red-Brown Clay and Silt	10 YR 8/2		WEATHERED DOLOMITE		
9	18	40	58						
	15	13							
10	6	5	11					20	
	4	5							
11	10	9	19						
	11	13		23.0'					1230.9
12	10	14	24	Weathered Dolomite with Yellow-Brown Silty Sand	10 YR 7/6				
	6	14						25	
13	27	18	45	26.0'					1227.9
				E.O.B.					

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 23, 1989

LOCATION Klahn Site 4+33N 8+46E

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

BORING NO. TB-12

SURFACE ELEV. 1259.1

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	1	3		Topsoil	10 YR			-	
1	4	7	11	-0.5'-	6/2		LOESS	-	
	7	8		Silt, Gray to Lt. Brown, with Clay	10 YR	ML		-	1255.1
2	9	12	21	-4.0'-	7/4			-	
	7	7		Sand, Red to Yellow-Brown, with Clay and Silt				5 --	
3	10	16	26		5 YR	SC	RESIDUUM	-	
	5	7			5/8			-	
4	9	11	20					-	
	10	11		-9.0'-				-	1250.1
5	6	9	15	Clay, Red-Brown to Brown, with Dolomite Fragments and Silt	5YR	CL		10 --	
	3	15			4/6			-	
6	9	5	14	-12.0'-				-	1247.1
	5	12					WEATHERED	-	
7	12	20	32	Weathered Dolomite			DOLOMITE	-	
	23	100		-15.0'-				15 --	1244.1
				E.O.B. Rock				-	
								-	
								-	
								-	
								20 --	
								-	
								-	
								-	
								-	
								25 --	
								-	
								-	
								-	
								-	
								--	
								-	
								-	
								-	
								-	

KEY

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PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 23, 1989

LOCATION Klahn Site 4+91N 6+11E

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

TEST PIT TP-1

SURFACE ELEV. 1245.50

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5'			-	
NO	SAMPLES		Clay, Light Brown with silt (CL)			-	
						-	
						2 --	
						-	
						-	
				None		-	
			3.5'			-	1242.0
			Rock, Limestone and Chert			4 --	
						-	
			5.0'			-	1240.5
			E.O.P.			-	
						-	
						6 --	
						-	
						-	
						-	
						-	
						8 --	
						-	
						-	
						-	
						-	
						10 --	
						-	
						-	
						-	
						-	
						12 --	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 7+72N 1+00 E

JOB NO. 70389 DATE Dec. 13, 1989

TEST PIT TP-2

SURFACE ELEV. 1251.40

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5'			-	
	NO	SAMPLES	Clay, Light Brown with silt (CL)			-	
						-	
						2 --	
				None		-	
			3.0'			-	1248.4
			Clay, Light Brown with many rock fragments			4 --	
						-	1240.5
						-	
						6 --	
			6.5'			-	
			E.O.P. Rock			-	
						-	
						8 --	
						-	
						-	
						-	
						10 --	
						-	
						-	
						-	
						12 --	
						-	
						-	
						-	

KEY

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PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 7+02N 170.6 E

JOB NO. 70389 DATE Dec. 13, 1989

TEST PIT TP-3

SURFACE ELEV. 1254.6

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAM P #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
1	2' -	3'	.5'			-	
			Clay, Light Brown with silt (CL)			-	
						-	
						2 --	
						-	
						-	
						-	
			3.5'			-	1251.1
						4 --	
						-	
						-	
			Sand, Red-orange with clay (SC)			-	
						6 --	
						-	
						-	
						-	
						-	
						8 --	
						-	
						-	
						-	
			9.5'			-	1245.1
			E.O.P. Rock			10 --	
						-	
						-	
						-	
						-	
						12 --	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

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Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 6+30N, 2+40 E

JOB NO. 70389 DATE Dec. 13, 1989

TEST PIT TP-4

SURFACE ELEV. 1258.3

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
1	1.5' -	2.0'	.5'			-	
			Clay, Light Brown with silt (CL)			-	
						-	
						2 --	
			2.5'			-	1255.8
						-	
						-	
			Sand, coarse with gravel with sand and clay			-	
			lenses (extremely variable)			4 --	
						-	
						-	
						-	
						-	
						6 --	
						-	
						-	
						-	
			7.5'			-	1250.8
			Rock, Limestone and Chert			8 --	
			8.5'			-	
			E.O.P.			-	
						-	
						-	1245.1
						10 --	
						-	
						-	
						-	
						-	
						12 --	
						-	
						-	
						-	
						-	

KEY

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Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 6+11 N, 3+61 E

JOB NO. 70389 DATE Dec. 13, 1989

TEST PIT TP-7

SURFACE ELEV. 1258.9

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
1	1.5' -	2.0'	.5'			-	
			Clay, Light Brown with silt	P200 = 99.53%		-	
				CLAY = 28.0%		-	
				LL = 37.7	CL	2	
				Pi = 19.4		-	
						-	
2	3.0' -	4.5'		P200 = 88.58%		-	
				CLAY = 26.0%		-	
				LL = 35.0	CL	4	
				Pi = 15.2		-	
						-	
			5.5'			-	1253.4
			Clay, Red, Sandy			-	
			6.0'			6	1252.9
						-	
			Clay, Yellow	P200 = 78.53%		-	
3	6.0' -	8.0'		CLAY = 50%	CH	-	
				LL = 56.0		-	
				Pi = 29.9		8	
						-	
						-	
			9.0'			-	1249.9
			Sand, orange			-	
			10.0'			10	
			E.O.P.			-	
						-	
						-	
						-	
						12	
						-	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 6+12N, 6+14E

JOB NO. 70389 DATE Dec. 13, 1989

TEST PIT TP-8

SURFACE ELEV. 1251.9

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			--	
			.5				
			Clay, Lt. Brown with Silt	P200=98.25%		-	
				Clay=25%		-	
				LL=39.6	CL	2 --	
				Pi=16.8		-	
1	3'	-4'		Max D.D.=116.9 pcf		-	
				O.M.=16.1%		-	
						-	
						4 --	
			4.5	P200=52.8%		-	1247.4
2	5'	-5.5'	Clay, Red with Rock Fragments	Clay=26.0%		-	
				LL=42.3	CL	-	
				Pi=23.5		-	
			6.0			6 --	1245.9
			Clay, Yellow-Green			-	
3	6'	-7'		P200=95.3%	CH	-	
			7.0	Clay=25.0%		-	1244.9
			Sand, Orange	LL=54.8		-	
				Pi=29.4		8 --	
			8.5			-	1243.4
			E.O.P.			-	
						-	
						10 --	
						-	
						-	
						-	
						-	
						12 --	
						-	
						-	
						-	
						-	

KEY

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Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 7+38N, 4+59E

JOB NO. 70389 DATE Dec. 13, 1989

TEST PIT TP-9

SURFACE ELEV. 1239.4

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			0	
1	1'	2'	.5				
			Clay, Light Brown with Silt				
						2	
				P200=75.5%			
				Clay=20%	CL		
2	3'	4'		LL=37.0			
				Pi=17.3			
			4.0			4	1235.4
			Clay, Red, Sandy	P200=72.9%			
3	5'	6'		Clay=40%	CL		
				LL=54.5			
				Pi=28.0		6	
			7.0				1232.4
			Weathered Bedrock, Limestone				
			8.0			8	
			E.O.P.				
						10	
						12	

KEY

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Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 8+64N, 3+04E

JOB NO. 70389 DATE Dec. 13, 1989

TEST PIT TP-10

SURFACE ELEV. 1234.8

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			.5			-	
			Topsoil			-	
						-	
1	2'	-3'	Clay, Lt. Brown with Silt	P200=98.71%		-	
				Clay=27.0%	CL	2 --	
				LL=40.0		-	
				Pi=18.1		-	
						-	
						-	
						4 --	
			5.0			-	1229.8
			Clay, Red with Sand			-	
						-	
2	6'	-7'		P200=43.54%		6 --	
				Clay=29.0%	CL	-	
				LL=48.9		-	
				Pi=24.3		-	
			7.5			-	1227.3
						8 --	
			Clay, Black/Green, Organic	P200=96.9%		-	
				Clay=68.0%	Pt	-	
3	9'	-10'		LL=113.5		-	
				Pi=56.4		-	
						10 --	
						-	
						-	
			11.0			-	1223.8
						-	
			E.O.P.			12 --	
						-	
						-	
						-	

KEY

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Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 10+20N, 4+30E

JOB NO. 70389 DATE Dec. 13, 1989

TEST PIT TP-11

SURFACE ELEV. 1244.9

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil	P200=94.5%		0	
			.5	Clay=27.0%			
1	1'	2'	Clay, Light Brown with Silt	LL=39.5	CL		
				Pi=16.6			
			2.0			2	1242.9
			Clay, Red with Silt and Sand and Occasional Cobble up to 4" diameter	P200=73.6%			
				Clay=42.0%	CL		
2	3.5'	4.0'		LL=47.8			
				Pi=25.9		4	
						6	1238.9
			6.0				
3	6'	7'		P200=33.6%	SC		
			7.0				1237.9
			E.O.P. Rock			8	
						10	
						12	

KEY

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LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 9+56N, 5+07E

JOB NO. 70389 DATE Dec. 13, 1989

TEST PIT TP-15

SURFACE ELEV. 1250.7

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			0	
			.5				
1	1'	2'	Clay, Lt. Brown with Silt	P200=99.63% Clay=27.0% LL=41.4 Pi=16.27	CL	2	
2	3'	4'		P200=99.56% Clay=22.0% LL=38.3 Pi=17.03	CL	4	
						6	
			6.5				1244.20
3	8'	9'	Clay, Red with Sand	P200=29.12	SC	8	
						10	
			11.0				1239.70
						12	

KEY

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LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 7+97N, 10+21E

JOB NO. 70389 DATE Dec. 13, 1989

TEST PIT TP-16

SURFACE ELEV. 1236.0

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	SAMPLE DEPTH To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
						-	
			.5			-	
						-	
No Samples			Sand with Rock			-	
			Rock up to 1.5' Diameter			2 --	
						-	
						-	
						-	
						-	
						4 --	
						-	
						-	
						-	
			5.5			-	1230.5
						6 --	
			E.O.P.			-	
						-	
						-	
						-	
						8 --	
						-	
						-	
						-	
						-	
						10 --	
						-	
						-	
						-	
						-	
						12 --	
						-	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 11+75, 5+56E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-18

SURFACE ELEV. 1234.9

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
1	1'	-1.5'	Clay, Light Brown with Silt (CL)			-	
						-	
			2.0			2	1232.9
			Rocky Seam			-	
			2.5			-	
			Clay, Red-Yellow, with Sand (CL)			-	
						-	
						4	
2	4'	-5'				-	
						-	
			5.0			-	1229.9
			Clay, Light Brown with Silt (CL)			-	
						6	
						-	
						-	
3	6'	-7'				-	
						-	
			8.0			8	1226.9
			E.O.P.			-	
						-	
						-	
						-	
						10	
						-	
						-	
						-	
						-	
						12	
						-	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 13+30N, 6+82E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-19

SURFACE ELEV. 1250.9

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	SAMPLE DEPTH To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
No Samples						-	
						-	
						2 --	
						-	
						-	
			3.5			-	1247.40
			Clay, Light Brown, with a lot of Sand and Rock			-	
						4 --	
						-	
						-	
			5.5			-	1245.40
			E.O.P.			-	
						6 --	
						-	
						-	
						-	
						-	
						8 --	
						-	
						-	
						-	
						-	
						10 --	
						-	
						-	
						-	
						-	
						12 --	
						-	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 12+04N, 8+37E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-20

SURFACE ELEV. 1251.3

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
						-	
						-	
						2 --	
1	2'	-3'	Clay, Light Brown with Silt	P200=99.8%		-	
				Clay=26.0%	CL	-	
				LL=36.3		-	
				Pi=15.12		-	
						4 --	
2	4'	-5'		P200=99.7%		-	
				Clay=27.0%	CL	-	
				LL=41.5		-	
				Pi=18.19		-	
						6 --	
						-	
						-	
						-	
						-	
						8 --	
				P200=99.7		-	
				Clay=16.0	CL	-	
3	8'	-9'		LL=36.5		-	
				Pi=15.05		-	
			10.0			10 --	1241.3
				P200=61.21		-	
4	10'	-11'	Clay, Yellow-Brown with Sand	Clay=39.0	CL	-	
				LL=45.0		-	
				Pi=23.3		-	
						12 --	
			12.5			-	1238.8
						-	
			E.O.P.			-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 9+52N, 11+47E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-21

SURFACE ELEV. 1241.0

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
						-	
						-	
						2	
1	2'	-3'	Clay, Light Brown with Silt	P200=99.73%		-	
				Clay=30.0%	CL	-	
				LL=41.3		-	
				Pi=19.31		-	
						4	
						-	
						-	
						-	
				P200=99.6%		-	
				Clay=28.0%	CL	6	
2	6'	-7'		LL=37.4		-	
				Pi=15.4		-	
						-	
						-	
				P200=59.8		8	
				Clay=32.0	CH	-	
3	8'	-9'		LL=55.5		-	
				Pi=30.8		-	
			9.5			-	1231.50
						10	
			Clay, Yellow-Orange with Sand			-	
						-	
4	10'	-11'				-	
						-	
						12	
						-	
						-	
						-	
			14.0 - E.O.P.			-	1227.0

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 8+26N, 13+03E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-22

SURFACE ELEV. 1255.0

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	SAMPLE DEPTH To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
						-	
						-	
						2 --	
1	3'	-4'	Clay, Light Brown with Silt	P200=99.81		-	
				Clay=19.0	CL	-	
				LL=38.8		-	
				Pi=15.58		-	
						4 --	
						-	
						-	
						-	
						-	
						6 --	
2	6.5'	-7.5'				-	
						-	
						-	
						-	
			8.0			8 --	1247.0
				P200=73.36		-	
			Clay, Red	Clay=36.0	CL	-	
3	9'	-10'		LL=49.5		-	
				Pi=23.56		-	
						10 --	
						-	
						-	
			11.0			-	
			E.O.P. Rock			-	
						12 --	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 11+07N, 12+73E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-23

SURFACE ELEV. 1252.3

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	SAMPLE DEPTH To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			0	
			.5				
			Clay, Light Brown with Silt			2	
			2.5				1249.8
			Clay, Red with Some Rock			4	
						6	
			6.5				1245.8
1	6.5'	10'	Clay, Red, Yellow, and White with Sand and Some Rock	Proctor Max DD=113.5 pcf O.M.=19.2		8	
			10.0			10	1242.3
			Weathered Rock			12	
			12.0				1240.3
			E.O.P.				

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 13+59N, 9+63E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-24

SURFACE ELEV. 1243.4

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
1	1'	-2'				-	
			Clay, Light Brown with Silt			-	
						2 --	
						-	
						-	
			3.0			-	1240.4
						-	
			Clay, Red, With Silt and Some Rock			4 --	
						-	
3	4'	-5'				-	
						-	
			6.0			6 --	1237.4
						-	
						-	
3	7'	-8'	Clay, Yellow with Silt and Some Fine Sand			-	
						-	
						8 --	
						-	
						-	
						-	
						-	
						10 --	
4	10'	-11'				-	
						-	
						-	
						-	
			12.0			12 --	1231.4
						-	
			E.O.P.			-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-25

SURFACE ELEV. 1236.2

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
1	1.5'	-2.5'	Clay, Light Brown with Silt	P200=98.0% Clay=25.0% LL=38.3 Pi=15.45	CL	-	
						2 --	
			2.5			-	1233.7
			Clay, Red with Some Rock	P200=78.9% Clay=57.0% LL=63.6 Pi=35.7	CH	-	
						4 --	
2	4'	-5'				-	
						-	
			6.0			6 --	1230.2
			Clay, Red-Yellow with Sand and White Clay Lenses			-	
						-	
						-	
						8 --	
						-	
						-	
						-	
			10.0			10 --	1226.2
			E.O.P.			-	
						-	
						-	
						12 --	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 15+48N, 7+30E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-26

SURFACE ELEV. 1248.5

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	SAMPLE DEPTH To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
						-	
						-	
			Clay, Red with Silt and			2 --	
			Occasional Sand and Rock			-	
No Samples						-	
						-	
						-	
						4 --	
						-	
						-	
						-	
						-	
						6 --	
						-	
						-	
						-	
						-	
						8 --	
			8.5			-	1240.0
						-	
			E.O.P. Rock			-	
						-	
						10 --	
						-	
						-	
						-	
						-	
						12 --	
						-	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn 16+40N, 9+33E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-27

SURFACE ELEV. 1251.0

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAM P #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
1	1.5'	2.5'				-	
			Clay, Light Brown with Silt	P200=98.95%		-	
				Clay=27.0%	CL	2	
				LL=40.5		-	
				Pi=17.6		-	
						-	
			3.5			-	1247.5
			Clay, Red with Trace of Sand			4	
						-	
2	4'	5'		P200=84.04%		-	
				Clay=50.0%	CH	-	
				LL=65.0		6	
				Pi=32.55		-	
						-	
			7.0			-	
3	7'	9'				-	
			Clay, Red with a lot of Sand	P200=32.24%	SC	8	
						-	
						-	
						-	
						-	
						10	
						-	
						-	
						-	
			11.5			-	1239.5
						12	
						-	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 15+20N, 10+88E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-28

SURFACE ELEV. 1242.1

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAM P #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
No Samples						-	
			Clay, Light Brown with Silt			-	
						2 --	
						-	
						-	
			3.0			-	1239.1
						-	
			Sand, Red with Clay			4 --	
						-	
						-	
						-	
						-	
						6 --	
						-	
						-	
						-	
						-	
						8 --	
						-	
						-	
						-	
			9.5			-	
						10 --	
			E.O.P.			-	
						-	
						-	
						12 --	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 5, 1989

LOCATION Klahn Site 14+01N, 12+58E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-A

SURFACE ELEV. 1255.0

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			0	
			.5				
			Clay, Light Brown with Silt				
						2	
			2.5				1252.5
			Clay, Red with Some Rock				
1	4'	-5'		P200=91.5% Clay=54.0% LL=62.8 Pi=32.4	CH	4	
			6.5			6	1248.5
2	7'	-8'	Clay, Green/Orange with Some Rock	P200=78.6% Clay=50.0% LL=58.2 Pi=31.0	CH	8	
			9.0				1246.0
			E.O.P. Rock			10	
						12	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 10+15N, 7+70E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-B

SURFACE ELEV. 1258.0

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
						-	
			Clay, Light Brown with Silt	P200=96.4%		-	
				Clay=34.0%	CL	2	
1	3'	-4'		LL=38.9		-	
				Pi=16.4		-	
						-	
						-	
			4.0			4	1254.0
						-	
			Clay, Red with Trace of Sand	P200=73.09		-	
2	5'	-6'		Clay=39.0	CL	-	
				LL=45.3		-	
				Pi=22.72		6	
						-	
				P200=84.76%		-	
				Clay=69.0%	CH	-	
				LL=63.5		-	
				Pi=32.5		-	
3	8'	-9'				8	
						-	
						-	
			9.0			-	1249.0
						-	
			E.O.P. Red Sand			10	
						-	
						-	
						-	
						-	
						12	
						-	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 9+20N, 8+65E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-C

SURFACE ELEV. 1257.8

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
						-	
						-	
			Clay, Light Brown with Silt			2 --	
				P200=99.5%		-	
				Clay=26.0%		-	
1	3'	-3.5'		LL=35.0	CL	-	
				Pi=15.0		-	
						4 --	
						-	
				P200=99.0%		-	
2	5'	-6'		Clay=30.0%	CL	-	
				LL=43.8		-	
				Pi=20.8		6 --	
						-	1250.8
			7.0	P200=60.9%		-	
				Clay=42.0%		-	
3	7'	-8'	Clay, Red-Yellow	LL=54.2	CL	-	
				Pi=28.7		8 --	
			8.0			-	1249.8
						-	
			Sand, Red-Yellow with Clay			-	
						-	
						10 --	
						-	
						-	
						-	
			11.5			-	
						12 --	
			E.O.P.			-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 10+50N, 9+40E

JOB NO. 70389 DATE Dec. 14, 1989

TEST PIT TP-D

SURFACE ELEV. 1252.0

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	SAMPLE DEPTH From	To	CLASSIFICATION AND REMARKS	LAB TESTS	USC	DEPTH	ELEV. (ft.)
			Topsoil			-	
			.5			-	
			Clay, Light Brown with Silt			-	
						-	
				P200=98.9%		2 --	
				Clay=24.0%	CL	-	
1	3'	-4'		LL=41.1		-	
				Pi=16.23		-	
						-	
						4 --	
						-	
						-	
			5.0			-	1247.0
			Sand, Orange with Clay			-	
						6 --	
						-	
						-	
						-	
			8.5			8 --	1243.5
			E.O.P. Rock			-	
						-	
						-	
						10 --	
						-	
						-	
						-	
						12 --	
						-	
						-	
						-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

LL = LIQUID LIMIT

Pi = PLASTICITY INDEX

PROJECT Vernon County

DATE(S) May 4, 1989

LOCATION Klahn Site 8+80N, 10+52E

JOB NO. 70389 DATE Dec. 14, 1989

BORING NO. MW-8R

SURFACE ELEV. 1256.1

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6" 6" 12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
		Topsoil					
		1.0					
				CL	LOESS	5	1250.7
		7.0		CL			1248.7
					RESIDUUM		
1		10.5		SC		10	1245.2
1							
1			R	CL		15	
						20	
		21.5					1234.20
					WEATHERED DOLOMITE	25	

Obtained descriptions from MW-7

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Exploration Technology

JOB NO. DATE

BORING NO. MW-8R

SURFACE ELEV. 1256.1

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
1					?		-	
2	-	-	Weathered Dolomite With Interspersed Red Clay Residuum			%	-	
3					?		-	
							30 --	
4					?		-	
							-	
							-	
							-	
							35 --	
5					-		-	
							-	
							-	
							-	
							40 --	
							-	
							-	
							-	
			44'				-	
							45 --	
6		/ /	Dolomite, With Occasional Small Vugs and Chert				-	
							-	
7							-	
							50 --	
8		/ /					-	
							-	
							-	
							-	
							55 --	
9	52.0'	60.0'					-	
							-	
			58'				-	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-8R

SURFACE ELEV. 1256.1

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
							-	
							-	
							-	
							-	
10			Large Vugs				65 --	
							-	
							-	
							-	
							70 --	
							-	
		72.0						1183.70
							-	
							-	
11							75 --	
			Small Vugs				-	
							-	
							-	
							80 --	
							-	
							-	
							-	
							-	
12							85 --	
							-	
							-	
							-	
							-	
							90 --	
							-	
							-	
							-	
							-	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-8R

SURFACE ELEV. 1256.1

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
13								
14			(1.5 ft. Weathered Zone With Red-Brown Clay)				100	1155.7
15							105	
			Dolomite, With Occasional Small Vugs				110	
16							115	
							120	
17							125	
			(3" White Silty Clay Seam)					
18			130'		1.1			1125.70

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-8R

SURFACE ELEV. 1256.1

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
							-	
							-	
							-	
							-	
							135 --	
							-	
							-	
							-	
19							-	
							140 --	
							-	
							-	
							-	
							-	
							145 --	
							-	
							-	
			148'				-	1107.7
20			ugs				-	
							150 --	
							-	
							-	
			153'				-	1102.7
			Sandy Dolomite				-	
			155'				155 --	1100.7
21							-	
							-	
							-	
							-	
							160 --	
							-	
							-	
							-	
22							-	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-8R

SURFACE ELEV. 1256.1

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			169'					1086.7
23	170'	175'		70%	2.86	19%	170	
24	173.5	180.5	No v.	53%	1.6	23%	175	
25	180.5	188.5		88%	4.2	16%	180	
			186.5				185	1069.2
			188.5					1067.2
			Sany				190	
26	188.5	198.5	193	100%	1.4	76.5	195	1062.7

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-8R

SURFACE ELEV. 1256.1

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
							-	
							-	
							-	
							-	
27				76%	1.13	63%	205 --	
							-	1049.7
			207'				-	1048.7
			End of Boring - Set Well				-	
							-	
							210 --	
							-	
							-	
							-	
							-	
							215 --	
							-	
							-	
							-	
							-	
							220 --	
							-	
							-	
							-	
							-	
							225 --	
							-	
							-	
							-	
							-	
							230 --	
							-	
							-	
							-	
							-	1021.2

KEY

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RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-9

SURFACE ELEV. 1255.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	4	4		Topsoil					
				1.0	10 YR			-	
1	4	4	8	Clay, Light Brown to Gray-Brown, with Silt	4/4	CL	LOESS	-	
2	6	6						-	
3	11	22	33					-	
4	8	4						-	
					10 YR			5 --	1250.7
5	4	6	10		5/6	CL		-	
6	5	32		7.0				-	1248.7
7	14	19	33					-	
9	6	5		Clay, Red-Brown to Yellow, With Red Sand	2.5 YR		RESIDUUM	-	
10	5	7	12	10.5	4/6	SC		10 --	1245.2
12	7	17						-	
	27	20	47					-	
13	2	3		Clay, Red-Brown, With Occasional Silt and Sand				-	
	7	8	15		10 YR			-	
14	30	35			3/3	CL		15 --	
15	25	27	52					-	
	17	27						-	
	21	2	23					-	
	3	3						-	
16	6	7	13					-	
17	11	28						20 --	
	19	17	36	21.5				-	1234.20
	95	33					WEATHERED DOLOMITE	-	
	10	35	45	continued on page 2 of 5				-	
19	31	28						25 --	
	20							-	
								-	
								-	
								-	
								--	
								-	
								-	
								-	

Geologic descriptions from MW-7

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED July 6, 1989

LOCATION Klahn Site, 12+31N, 10+94E

GROUNDWTR 193.9 FT BELOW GS AT ELEV. OF 1061.84

DRILLERS Exploration Technology

JOB NO. 70389 DATE Dec. 22, 1989

BORING NO. MW-9

SURFACE ELEV. 1255.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
1	25′	26′	Weathered Dolomite With Interspersed Red Clay Residuum	20%	?	0%	-	
2	26′	27′		80%	6-10	0%	-	
3	27′	30′		50%	?	0%	-	
4	30′	32.5′		25%	?	0%	30 --	
5	32.5′	40′		0.0%	-	0%	35 --	
			-----44′-----				40 --	1211.70
6	44′	47.5′	Dolomite, With Occasional Small Vugs and Chert	86%	2.0	57%	45 --	
7	47.5′	50.0′		88%	2.0	62%	50 --	
8	50.0′	52.0′		60%	2.5	40%	55 --	
9	52.0′	60.0′		74%	1.0	63%	-	
			-----58′-----				-	1197.70

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-9

SURFACE ELEV. 1255.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			4" Brown Clay Seam					
10	60'	70'	Dolomite, With Occasional Large Vugs	70%	1.7	53%	65	
							70	
			72.0					1183.70
11	70'	80'	Dolomite, With Occasional Small Vugs	73%	1.2	52%	75	
					5.0		80	
12	80'	90'		67%	3-5	28%	85	
							90	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-9

SURFACE ELEV. 1255.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
13	90′	100′		48%	1-5	20%	-	
							-	
							-	
							-	
							100 --	1155.7
14	100′	103′	(1.5 ft. Weathered Zone With Red-Brown Clay)	66%	-	0%	-	
							-	
							-	
							-	
							105 --	
15	103′	110′		86%	3.8	39%	-	
							-	
							-	
							-	
							110 --	
			Dolomite, With Occasional Small Vugs				-	
							-	
							-	
							-	
							115 --	
16	110′	120′		100%	2.4	64%	-	
							-	
							-	
							-	
							120 --	
							-	
							-	
							-	
17	120′	127′					-	
				100%	3.8	34%	125 --	
							-	
			(3" White Silty Clay Seam)				-	
							-	
18	127′	135′	----------130′----------	100%	1.1	90%	----- -	1125.70

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-9

SURFACE ELEV. 1255.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			131.5'				-	1123.9
			End of Boring - Set Well				-	
							-	
							135 --	
							-	
							-	
19	135'	145'					-	
							140 --	
							-	
							-	
							-	
							145 --	
							-	
							-	
							-	
20	145'	155'					-	
							150 --	
							-	
							-	
							-	
							155 --	
21	155	160					-	
							-	
							-	
							160 --	
							-	
							-	
22	160'	170'					-	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	*03268*	*MW-13P*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Traut Hydro Tech *Daryl Karasch*	*02/25/2003*	*02/26/2003*	*Versa Sonic*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
117	*JX071*	*MW-13P*	*1127.97 Feet MSL*	*1224.5 Feet MSL*	*7.0" inches*

Boring Location State Plane N, E	Lat / Long	Local Grid Location (if applicable)
SW 1/4, SE 1/4, Sec.15 , T13N, R4W	*Lat 43 / 35' / 49.49"* *Long 90 / 43' / 14.85"*	*295.72 Feet N* *1259.36 Feet E*

County	DNR County Code	Civil Town/City/ or Village
Vernon	*63*	*Viroqua*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	7/10		2 4 6 8	Grayish brown clayey silt, trace sand (Loess)	CL									
	5/10		10 12 14 16 18	Yellowish reddish brown sandy, clayey silt, and silty, clayey sand	CL/SC CL/CH									
	5/10		20 22	Yellowish light brown clayey, silty sand, trace to little gravel Blue-gray and brown clayey silt	SC CL									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Peter D Boulton Firm Central Wisconisn Engineers & Architects

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
	5/10		26–30	Yellowish light brown clayey, silty sand, little fine gravel	CL / SC									
	7/10		32–40	Yellowish brown clayey, silty sand and clayey, sandy silt, little fine gravel	SC/CL									
	8/10		40–48	Yellowish brown clayey silt, little sand and fine gravel	SM / CL									
	9/10		50–56	Yellowish light brown silty fine sand, trace clay, little gravel (Weathered sandstone) Gravel content increases with depth	SM									
	8/10		60–62		SM/SC									

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	8/10		66–68–70–72–74	Light brown silty sand and sitly, clayey sand, some gravel (Weathered sandstone)	SM/SC									
	9/10		76–78–80	Dolomite, occasional small vugs (Highly fractured zone @ 76'–77')										Rec: 60% FF: 6/ft RQD= 0%
			82	Shaley, sandy siltstone, poorly consolidated										Rec: 60% FF: 5.7/ft RQD= 0%
	9/10		84–86–88	Dolomite, occasional small vugs	Bdrk									Rec: 85% FF: 6.1/ft RQD= 0%
	8/10		90–92–94–96–98											Rec: 50% FF: -- RQD= 0% Rec: 60% FF: 6/ft RQD= 0%
			100–102	E.O.B. @ 100'										

State of Wisconsin
Department of Natural Resources

Route To:
- [x] Solid Waste
- [ ] Emergency Response
- [ ] Wastewater
- [ ] Haz. Waste
- [ ] Underground Tanks
- [ ] Water Resources
- [ ] Other

SOIL BORING LOG INFORMATION

Form 4400-122 7-91

94690000

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill		MW1R

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Ace Well Drilling David Holzem	01/10/94 (M M D D Y Y)	01/11/94 (M M D D Y Y)	Air Rotary

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW1R	1095 Feet MSL	1245 Feet MSL	6 inches

Boring Location
State Plane 582,646 N, 1,776,298 E S/C/N Lat ____ Long ____
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 E(W)

Local Grid Location (If applicable)
317 Feet [x] N [ ] S 926 Feet [x] E [ ] W

County: Vernon
DNR County Code: 63
Civil (Town) City/ or Village: Viroqua

Sample Number	Sample Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			10	0-166' Earth Drilled No samples collected										
			20	0-55' unconsolidated, silty, sandy clay	CL									
			30											
			40											
			50											
			60	55'-74' Sandy dolomite to dolomitic sandstone, yellow/tan, thinly bedded, with shaley partings.										
			70											
			80	74-140' Light tan, dolomite, more competent and harder than previous interval, massive-texture.										
			90	void/fracture - rod dropped										
			100											
			110	void/fracture										
			120											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Sandra S Brake
Firm: CENTRAL WIS. ENGINEERS, INC.

This form is authorized by Chapters 144.14 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Vernon Co. Dale+, 11

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A
7-91

Boring Number MW1R Use only as an attachment to Form 4400-122.

Sample Number	Sample Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plastic Limit	Soil Properties: P 200	RQD/ Comments
			130											
			140	140-166 Tan, dolomite, hardness of unit increased from previous interval.										
			150											
			160	≈ 2' Fracture ≈ 162'-164'										
			170	EOB @ 166'										
				Well Set @ 162'										
			190											
			200											

State of Wisconsin
Department of Natural Resources

Route To:
- [x] Solid Waste
- [ ] Haz. Waste
- [ ] Emergency Response
- [ ] Underground Tanks
- [ ] Wastewater
- [ ] Water Resources
- [ ] Other

SOIL BORING LOG INFORMATION
Form 4400-122 7-91

94690000

Page 1 of 2

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill		MW1PR

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started (M M D D Y Y)	Date Drilling Completed (M M D D Y Y)	Drilling Method
Ace Well Drilling David Holzem	01/12/94	01/12/94	Air Rotary

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW1PR	1130 Feet MSL	1245 Feet MSL	6 inches

Boring Location
State Plane 582,646 N, 1,776,298 E S/C/N Lat ___ ___ ___
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 E W Long ___ ___ ___

Local Grid Location (If applicable)
320 Feet ☐ S ☒ N 918 Feet ☐ W ☒ E

County: Vernon
DNR County Code: 63
Civil Town/City/ or Village: Viroqua

Sample Number	Sample Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			10	0-126' Earth Drilled No Samples collected 0-57' unconsolidated, red silty, sandy clay	CL									
			20											
			30											
			40											
			50											
				Bed Rock contact										
			60	57-126' Tan sandy dolomite to dolomitic sandstone										
			70											
				void/fracture 6"-10" in width										
			80											
			90											
			100											
			110											
			120											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Sandra S Brock
Firm: CENTRAL WIS. ENGINEERS, INC.

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Vernon Co. Baletill

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT

Form 4400-122A 7-91

Boring Number _____ Use only as an attachment to Form 4400-122.

Sample Number	Sample Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plastic Limit	Soil Properties: P 200	RQD/ Comments
			130	EOB @ 126'										
			140	Well Set @ 125'										
			150											
			160											
			170											
			180											
			190											
			200											

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	MW-1RZ

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Traut Hydro Tech Daryl Karasch	03/12/2003	03/12/2003	Versa Sonic

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
123	JX074	MW-1RZ	1085.52 Feet MSL	1244.0 Feet MSL	7.0 inches

Boring Location State Plane	Lat / Long	Local Grid Location (If applicable)
SE 1/4, SW 1/4, Sec.15 , T13N, R4W	Lat 43 / 35' / 49.49" Long 90 / 43' / 14.85"	299 Feet N 918 Feet E

County	DNR County Code	Civil Town/City/ or Village
Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	8/10		2	Yellowish brown clayey silt, trace fine sand	CL			10YR 6/6						
			4	(Loess)										
			6	Yellowish reddish brown sandy, clayey silt, trace fine gravel	CL			5YR 4/6						
			8	Yellowish reddish brown silty sand, little fine gravel	SM			7.5YR 5/8						
	9/10		10	Reddish brown clayey, sandy silt, trace fine gravel	CL			10YR 5/4						
			12	**Yellowish reddish brown clayey, silty sand,** trace fine gravel	SC			7.5YR 5/8						
			14											
			16	Yellowish light brown silty sand, little clay, trace fine gravel	SM			7.5YR 6/8						
	6/10		18											
			20											
			22											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Peter D. Arntzen Firm Central Wisconisn Engineers & Architects

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	6/10		26–28	Yellowish light brown silty sand, little clay, little gravel, with gravelly layers	SM			7.5YR 6/8						
			30–32											
	7/10		34–36	Yellowish reddish brown clayey, silty sand, little gravel	SC			7.5YR 7/8						
			38–40	Yellowish light brown clayey, silty sand, some coarse gravel										
	4/10		42–44		CL			7.5YR 5/8						
			46	Yellowish light brown sandy, clayey silt, some coarse gravel										
			48	Aqua blue and brown clayey silt, trace to little sand and gravel				5G 6/2						
	5/10		50–52	Brown sandy, clayey silt and sandy, silty clay, trace gravel	CL/CH			7.5YR 4/6						
			54–56											
			58	Yellowish light brown gravelly, sandy , clayey silt	CL			7.5YR 5/8						
	5/10		60–62	Brown clayey silt and silty clay, trace to little sand and gravel	GC / CH/CL			7.5YR 4/6						

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	5/10		66–68–70		CH/CL			7.5YR 4/6						
	7/10		70–72–74–76	Brown sandy clayey silt, little to trace gravel	CL			7.5YR 4/6						
			76–78–80	Light brown silty fine sand, little gravel, trace clay	SM			10YR 6/6						
	10/10		80–82–84–86	Same with coarse gravelly layers	GM									
			86–88	Grayish brown silty sand	SM			10YR 7/3						
			88–90	Grayish brown gravelly, silty, clayey sand	SC									
	9/10		90–92–94–96–98	Sandy siltstone, poorly consolidated	Bdrk									Rec: 90% FF: 3.8/ft RQD: 30%
	8/10		98–100–102	Dolomite, occasional small vugs										Rec: 75% FF: 5.6/ft

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	8/10		106 108 110	(Highly fractured zone @ 103'–106')										RQD: 3%
	9/10		112 114 116 118 120	(Highly fractured zone @ 110'–115')										Rec: 80% FF: 4.8/ft RQD: 8%
	10/10		122 124 126	Sandy dolomite	Bdrk									Rec: 93% FF: 5.2/ft RQD: 19%
	10/10		128 130 132 134 136 138	**Dolomite** Sandy dolomite with gray–green shale and sandstone interbeds										Rec: 96% FF: 3.4/ft RQD: 61%
	10/10		140 142	Dolomite, occasional small vugs (Highly fractured zone @ 140'–141')										Rec: 88% FF: 5.5/ft

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	10/10		146–148	(Highly fractured zone @ 150'–154')	Bdrk									RQD: 13%
	7/10		150–156											Rec: 66% FF: 6.8/ft RQD: 3%
	10/10		156–164	(Highly fractured zone @ 155'–157') Dolomitic sandy siltstone, poorly consolidated										Rec: 83% FF: 4.3/ft RQD: 20%
	10/10		164–174											Rec: 85% FF: 4.3/ft RQD: 22%
	4/5		174–182	Sandy dolomite and dolomitic sandstone (Highly fractured zone @ 180'–181')										Rec: 80% FF: 3.9/ft

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
	4/5				Bdrk									RQD: 40%
			186	E.O.B. at 185'										
			188											
			190											
			192											
			194											
			196											
			198											
			200											
			202											
			204											
			206											
			208											
			210											
			212											
			214											
			216											
			218											
			220											
			222											

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TEST PITS (TP) EXCAVATED MAY 25, 1991

TP 100

TP 100 was excavated at the location of TP 22, where rock had previously been reported at a depth of 11 feet. Using a larger backhoe, TP 100 was excavated to a depth of approximately 20 feet (10 feet below the proposed landfill sub-base) without encountering competent bedrock. Although several bouldery soil zones were present (including one at 10 to 12 feet below surface), most of the material at this location was sandy to silty clay (SC, CL) or clay (CH). Two pictures of TP 100 are shown below.

TP 100: Upper 16 feet



TP 100: Bottom of Pit



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TP 101

TP 101 was excavated near the western edge of the proposed waste limits at a location where depth to bedrock was a concern. This excavation proceeded to a depth of approximately 26 feet (9 feet below the proposed landfill sub-base) without encountering competent bedrock. The majority of the material at this location was sandy to silty clay (SC, CL) or clay (CH). Two pictures of TP 101 are shown below.

TP 101: Top of Pit



TP 101: Bottom of Pit



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TP 102

TP 102 was excavated at the location of AB 26, where rock had previously been reported at a depth of 5.5 feet. TP 102 was excavated to a depth of approximately 18 feet (12 feet below the proposed landfill sub-base) before encountering what appeared to be weathered bedrock. Although several bouldery soil zones were present, most of the material at this location was sandy to silty clay (SC,CL) or clay (CH). Two pictures of TP 102 are shown below.

TP 102: Top of Pit



TP 102: Bottom of Pit



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BORING NO. AB - 1

SURFACE EVEV. 1255.52 FT.

Central Wisconsin
Engineers
P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

SAMPLE NUMBER	BLOWS ON SAMPLER (140 lbs. - 2" O.D. - FALLING 30") 6" 6" per ft.	CLASSIFICATION AND REMARKS	LAB TESTS	UNIFIED CLASSIFICATION	POCKET PEN. READING (T.S.F.)	GEOLOGY	DEPTH	ELEV.
		Topsoil						
		----------0.5'----------						1255.02
		Clay red, brown with sand M - F		CL				
		----------15.0'----------						1240.52
		Sandy clay, dark brown		CL				
		----------19.0'----------						1236.52
		E.O.B. Rock						

KEY
C = ROCK CORE
A = AUGER SAMPLE
X = SPLIT SPOON
S = SHELBY TUBE
=

PROJECT Leonard Klahn, Vernon County Landfill
DATE(S) DRILLED April 30, 1987
LOCATION T 13 N R 4 W Section 15
GROUNDWATER --- FT. BELOW GS. AT ELEV. OF ---
DRILLERS James Construction Co. JOB NO. 57786
DATE 4-30-87

BORING NO. AB - 2

SURFACE EVEV. 1256.69 FT.

Central Wisconsin
Engineers
P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

SAMPLE NUMBER	BLOWS ON SAMPLER (140 lbs. - 2" O.D. - FALLING 30") 6"	6"	per ft.	CLASSIFICATION AND REMARKS	LAB TESTS	UNIFIED CLASSIFICATION	POCKET PEN. READING (T.S.F.)	GEOLOGY	DEPTH	ELEV.
				Topsoil					0.0	
				---------0.5'---						1256.19
				Clay, brown w/sand		CL				
									5.0	
				---------6.0'---						1250.69
				weathered rock						
				---------8.0'---						1248.69
				E.O.B. rock					10.0	
									15.0	
									20.0	
									25.0	
									30.0	

KEY
C = ROCK CORE
A = AUGER SAMPLE
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S = SHELBY TUBE
=

PROJECT Leonard Klahn, Vernon County Landfill
DATE(S) DRILLED April 30, 1987
LOCATION T 13 N R 4 W Section 15
GROUNDWATER --- FT. BELOW GS. AT ELEV. OF ---
DRILLERS James Construction Co. JOB NO. 57786
DATE 4-30-87

BORING NO. AB - 3

SURFACE EVEV. 1257.31 FT.

Central Wisconsin
Engineers
P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

SAMPLE NUMBER	BLOWS ON SAMPLER (140 lbs. - 2" O.D. - FALLING 30") 6"	6"	per ft.	CLASSIFICATION AND REMARKS	LAB TESTS	UNIFIED CLASSIFICATION	POCKET PEN. READING (T.S.F.)	GEOLOGY	DEPTH	ELEV.
				Topsoil					0.0	
				---------0.5'---						1256.81
				Sand, dark brown with clay		SC			5.0	
				---------6.0'---						1251.31
				E.O.B. rock					10.0	
									15.0	
									20.0	
									25.0	
									30.0	

KEY
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S = SHELBY TUBE
=

PROJECT Leonard Klahn, Vernon County Landfill
DATE(S) DRILLED April 30, 1987
LOCATION T 13 N R 4 W Section 15
GROUNDWATER --- FT. BELOW GS. AT ELEV. OF ---
DRILLERS James Construction Co. JOB NO. 57786
DATE 4/30/87

BORING NO. AB - 4

SURFACE EVEV. 1257.21 FT.

Central Wisconsin
Engineers
P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

SAMPLE NUMBER	BLOWS ON SAMPLER (140 lbs. · 2" O.D. · FALLING 30") 6" 6" per ft.	CLASSIFICATION AND REMARKS	LAB TESTS	UNIFIED CLASSIFICATION	POCKET PEN. READING (T.S.F.)	GEOLOGY	DEPTH	ELEV.
		Topsoil					0.0	
		---------0.5'---------						1256.71
		Sand, red brown w/clay		SC				
							5.0	
		--------6.5'--------						1250.71
		E.O.B.						
		rock						
							0.0	
							5.0	
							0.0	
							5.0	
							0.0	

KEY
C = ROCK CORE
A = AUGER SAMPLE
X = SPLIT SPOON
S = SHELBY TUBE
=

PROJECT Leonard Klahn, Vernon County Landfill
DATE(S) DRILLED April 30, 1987
LOCATION T 13 N R 4 W Section 15
GROUNDWATER --- FT. BELOW GS. AT ELEV. OF ---
DRILLERS James Construction Co. JOB NO. 57786
DATE 4/30/87

BORING NO. AB - 8

SURFACE EVEV. 1259.96 FT.

Central Wisconsin
Engineers
P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

SAMPLE NUMBER	BLOWS ON SAMPLER (140 lbs. - 2" O.D. - FALLING 30") 6"	6"	per ft.	CLASSIFICATION AND REMARKS	LAB TESTS	UNIFIED CLASSIFICATION	POCKET PEN. READING (T.S.F.)	GEOLOGY	DEPTH	ELEV.
				Topsoil					0.0	
				----------0.5'----------						1259.46
				Sand, red brown w/clay			SC			
									5.0	
				----------8.0'----------						1251.96
				E.O.B. rock					10.0	
									15.0	
									20.0	
									25.0	
									30.0	

KEY
C = ROCK CORE
A = AUGER SAMPLE
X = SPLIT SPOON
S = SHELBY TUBE
=

PROJECT Leonard Klahn, Vernon County Landfill
DATE(S) DRILLED April 30, 1987
LOCATION T 13 N R 4 W Section 15
GROUNDWATER --- FT. BELOW GS. AT ELEV. OF ---
DRILLERS James Construction Co. JOB NO. 57786
DATE 4/30/87

BORING NO. AB - 11

SURFACE EVEV. 1258.91 FT.

Central Wisconsin
Engineers
P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

SAMPLE NUMBER	BLOWS ON SAMPLER (140 lbs. - 2" O.D. - FALLING 30") 6" 6" per ft.	CLASSIFICATION AND REMARKS	LAB TESTS	UNIFIED CLASSIFICATION	POCKET PEN. READING (T.S.F.)	GEOLOGY	DEPTH	ELEV.
		Topsoil					0.0	
		----------0.5'----------						1258.41
		Clay red brown w/sand		CL				
							5.0	
							10.0	
		----------10.0'----------						1248.91
		Sand red M-F w/clay		~~SC~~ SC				
							15.0	
							20.0	
		----------21.0'----------						1237.41
		E.O.B. rock						
							25.0	
							30.0	

KEY
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S = SHELBY TUBE
=

PROJECT Leonard Klahn, Vernon County Landfill
DATE(S) DRILLED April 30, 1987
LOCATION T 13 N R 4 W Section 15
GROUNDWATER --- FT. BELOW GS. AT ELEV. OF ---
DRILLERS James Construction Co. JOB NO. 57786
DATE 4/30/87

BORING NO. AB - 7

SURFACE EVEV. 1261.10 FT.

Central Wisconsin
Engineers
P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

	SAMPLE NUMBER	BLOWS ON SAMPLER (140 lbs. - 2" O.D. - FALLING 30") 6" 6" per ft.	CLASSIFICATION AND REMARKS	LAB TESTS	UNIFIED CLASSIFICATION	POCKET PEN. READING (T.S.F.)	GEOLOGY	DEPTH	ELEV
0.0			Topsoil						
			--------0.5'----------						1260
			clay dark brown w/sand		CL				
5.0			---------5.0'----------						1256
			sand, yellow, M-F w/clay		SC				
0.0									
5.0									
20.0			---------20.0'----------						1241
			E.O.B. rock						
5.0									
0.0									

KEY
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X = SPLIT SPOON
S = SHELBY TUBE
=

PROJECT Leonard Klahn, Vernon County Landfill
DATE(S) DRILLED April 30, 1987
LOCATION T 13 N R 4 W Section 15
GROUNDWATER --- FT. BELOW GS. AT ELEV. OF ---
DRILLERS James Construction Co. JOB NO. 57786
DATE 4/30/87

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,252.8 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W

Lat 90° 50' 501.0"
Long 43° 35' 818.0"

Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some sand, little gravel										
2 AU			5.0		CL									
			7.5											
3 AU			10.0											
			12.5	BEDROCK, dolomite										
4 AU			15.0											
			17.5		BR									
5 AU			20.0											
			22.5											
			25.0	**Boring Refusal at 25 feet.** Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature John E. Stalf Firm Short Elliot Henrickson Inc. Tel: Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,252.2 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W

Lat 90° 50' 479.0"
Long 43° 35' 844.0"

Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	TOPSOIL	OL									
				Brown, LEAN CLAY, some sand, little gravel										
			2.5											
2 AU			5.0											
			7.5											
3 AU			10.0											
			12.5											
4 AU			15.0		CL									
			17.5											
5 AU			20.0											
			22.5											
6 AU			25.0											
			27.5											
			30.0											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
John E. Gallo	Short Elliot Henrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-2 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel *(continued)*										
8 AU			35.0											
			37.5		CL									
9 AU			40.0											
			42.5											
10 AU			45.0											
			47.5	BEDROCK, dolomite	BR									
			50.0	**Boring Refusal at 50 feet.** Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,251.1 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S/C/N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W
Lat 90° 50' 506.0"
Long 43° 35' 856.0"
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	TOPSOIL	OL									
				Brown, LEAN CLAY, some sand, little gravel	CL									
			2.5	BEDROCK, dolomite										
2 AU			5.0		BR									
			7.5											
3 AU			10.0											
				Boring Refusal at 11 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
John E. Gallo	Short Elliot Henrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-5

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,257.4 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S/C/N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W
Lat 90° 50' 471.0"
Long 43° 35' 874.0"
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	SAND & GRAVEL, basecourse										
			2.5	Brown, LEAN CLAY, some sand, little gravel										
2 AU			5.0		CL									
			7.5											
3 AU			10.0											
			12.5	BEDROCK, dolomite										
4 AU			15.0		BR									
			17.5											
				Boring Refusal at 19 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
John E. Gulf	Short Elliot Henrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-6

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,254.9 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W
Lat 90° 50' 497.0"
Long 43° 35' 890.0"
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	TOPSOIL	OL									
				Brown, LEAN CLAY, some sand, little gravel										
			2.5											
2 AU			5.0		CL									
			7.5											
3 AU			10.0	BEDROCK, dolomite	BR									
				Boring Refusal at 12 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
John E. Gulf	Short Elliot Henrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-8

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,258.7 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W

Lat 90° 50' 459.0"
Long 43° 35' 897.0"

Local Grid Location
☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some sand, little gravel, occassional cobbles										
2 AU			5.0											
			7.5											
3 AU			10.0											
			12.5											
4 AU			15.0		CL									
			17.5											
5 AU			20.0											
			22.5											
6 AU			25.0											
			27.5											
			30.0											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

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John E. Gulf	Short Elliot Henrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-8 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel, occassional cobbles *(continued)*	CL									
8 AU			35.0	BEDROCK, fine sandstone	BR									
			37.5	BEDROCK, dolomite, solid **Boring Refusal at 38 feet.** Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.	BR									

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-9

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,253.7 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W

Lat 90° 50' 492.0"
Long 43° 35' 925.0"

Local Grid Location
☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some sand, little gravel, occassional cobbles										
2 AU			5.0											
			7.5											
3 AU			10.0											
			12.5											
4 AU			15.0		CL									
			17.5											
5 AU			20.0											
			22.5											
6 AU			25.0											
			27.5											
			30.0											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
John E. Gulf	Short Elliot Henrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-9 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel, occassional cobbles *(continued)*	CL									
8 AU			35.0											
			37.5	BEDROCK, dolomite	BR									
9 AU			40.0	**Boring Refusal at 42 feet.** Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-11

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,253.9 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W
Lat 90° 50' 455.0"
Long 43° 35' 938.0"
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	SAND & GRAVEL, basecourse										
			2.5	Brown, LEAN CLAY, some sand, little gravel										
2 AU			5.0		CL									
			7.5											
3 AU			10.0											
			12.5	BEDROCK, dolomite	BR									
4 AU			15.0											
				Boring Refusal at 17 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

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Signature	Firm	Tel:
John E. Gulf	Short Elliot Henrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-12

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,259.9 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W

Lat 90° 50' 432.0"
Long 43° 35' 909.0"

Local Grid Location
☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	TOPSOIL	OL									
				Brown, LEAN CLAY, some sand, little gravel										
			2.5											
2 AU			5.0											
			7.5											
3 AU			10.0											
			12.5											
4 AU			15.0		CL									
			17.5											
5 AU			20.0											
			22.5											
6 AU			25.0											
			27.5											
			30.0											

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Signature	Firm	Tel:
John E. Gulf	Short Elliot Henrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-12 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel *(continued)*	CL									
8 AU			35.0	BEDROCK, fine sandstone, some shale	BR									
9 AU			40.0											
10 AU			42.5	BEDROCK, dolomite	BR									
			45.0	**Boring Refusal at 47 feet.** Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-13

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,258.2 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W

Lat 90° 50' 425.0"
Long 43° 35' 927.0"

Local Grid Location
☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0.0	TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some sand, little gravel										
2 AU			5.0		CL									
			7.5											
3 AU			10.0	Brown, LEAN CLAY, some sand, little gravel, occasional cobbles										
			12.5											
4 AU			15.0		CL									
			17.5											
5 AU			20.0	Brown, LEAN CLAY, some sand, little gravel										
			22.5											
6 AU			25.0		CL									
			27.5											
			30.0											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
John E. Gallup	Short Elliot Henrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-13 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel *(continued)*	CL									
8 AU			35.0											
			37.5	BEDROCK, dolomite	BR									
9 AU			40.0											
			42.5	**Boring Refusal at 43 feet.** Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-14

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,257.3 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S/C/N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W

Lat 90° 50' 405.0"
Long 43° 35' 921.0"

Local Grid Location
☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0.0	TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some sand, little gravel	CL									
2 AU			5.0	Brown, LEAN CLAY, some sand, little gravel, occasional cobbles										
			7.5											
3 AU			10.0		CL									
			12.5											
4 AU			15.0	Brown, LEAN CLAY, some sand, little gravel										
			17.5											
5 AU			20.0											
			22.5		CL									
6 AU			25.0											
			27.5											
			30.0											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
John E. Stalf	Short Elliot Henrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-14 Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel *(continued)*										
8 AU			35.0		CL									
			37.5											
9 AU			40.0	BEDROCK, dolomite										
			42.5											
10 AU			45.0		BR									
			47.5											
				Boring Refusal at 49 feet. Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-16

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,245.9 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W
Lat 90° 50' 385.0" Long 43° 35' 946.0"
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	TOPSOIL	OL									
				Brown, LEAN CLAY, some fine sand, little gravel										
			2.5											
2 AU			5.0											
			7.5											
3 AU			10.0											
			12.5											
4 AU			15.0		CL									
			17.5											
5 AU			20.0											
			22.5											
6 AU			25.0											
			27.5											
			30.0											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
John E. Gulf	Short Elliot Henrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-16 Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 AU					CL									
			32.5	BEDROCK, dolomite	BR									
8 AU			35.0	**Boring Refusal at 36 feet.** Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

Appendix B

Well Construction Records for Wells within 300-feet of Landfill Expansion

Monitoring Wells and Piezometers Inside Expansion Footprint

State of Wisconsin
Department of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Vernon County

Facility License, Permit or Monitoring Number: 03 68

Grid Location: 863.8 ft. [X] N. [ ] S. — 1794.6 ft. [X] E. [ ] W.

Well Name: MW-5A

Wis. Unique Well Number: DNR Well Number:

Type of Well: Water Table Observation Well [X] 11; Piezometer [ ] 12

Section Location: SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 [ ] E [X] W

Date Well Installed: 11 / 08 / 89 (m m / d d / y y)

Distance Well Is From Waste/Source Boundary: 55' From Prop. Waste Limits ft.

Well Installed By: (Person's Name and Firm)
Gus Pech
Exploration Technology, Inc.

Is Well A Point of Enforcement Std. Application? [X] Yes [ ] No

Location of Well Relative to Waste/Source: [ ] Upgradient [X] Sidegradient [ ] Downgradient [ ] Not Known

A. Protective pipe, top elevation 1225.81 ft. MSL
B. Well casing, top elevation 1226.17 ft. MSL
C. Land surface elevation 1224.0 ft. MSL
D. Surface seal, bottom 1146.7 ft. MSL or 79.5 ft.

1. USCS classification of soil near screen:
[ ] GP [ ] GM [ ] GC [ ] GW [ ] SW [ ] SP
[ ] SM [ ] SC [ ] ML [ ] MH [ ] CL [ ] CH
[X] Bedrock

15. Sieve analysis attached? [ ] Yes [X] No

14. Drilling method used: Rotary [X] 50; Hollow Stem Auger [ ] 41; Other [ ]

13. Drilling fluid used: Water [ ] 02; Air [ ] 01; Drilling Mud [X] 03; None [ ] 99

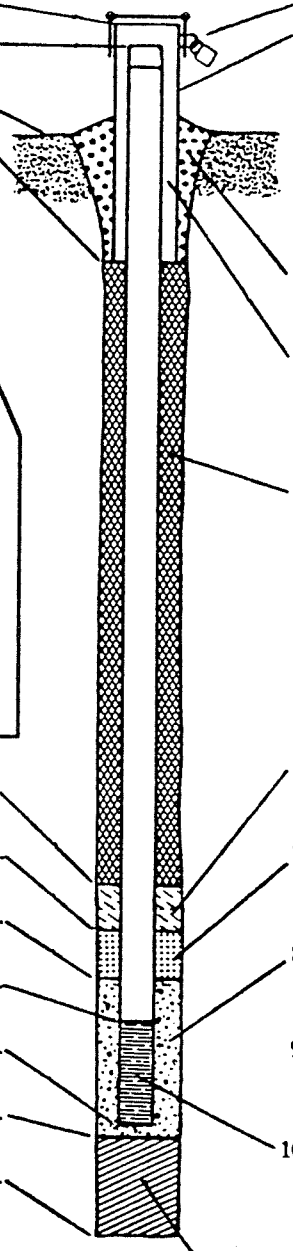
16. Drilling additives used? [X] Yes [ ] No

Describe: Foam

17. Source of water (attach analysis):
City of Viroqua Municipal Water

E. Bentonite seal, top 1146.7 ft. MSL or 79.5 ft.
F. Fine sand, top 1145.7 ft. MSL or 80.5 ft.
G. Filter pack, top 1143.7 ft. MSL or 82.5 ft.
H. Well screen, top 1137.9 ft. MSL or 88.3 ft.
I. Well screen, bottom 1122.9 ft. MSL or 103.3 ft.
J. Filter pack, bottom 1122.9 ft. MSL or 103.3 ft.
K. Borehole, bottom 1122.9 ft. MSL or 103.3 ft.

L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 2.00 in.



1. Cap and lock? [X] Yes [ ] No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel [X] 04; Other [ ]
d. Additional protection? [ ] Yes [X] No
If yes, describe:
3. Surface seal: Bentonite [X] 30; Concrete [ ] 01; Other [ ]
4. Material between well casing and protective pipe: Bentonite [X] 30; Annular space seal [ ]; Other [ ]
5. Annular space seal: Granular Bentonite [X] 33
_____ Lbs/gal mud weight ... Bentonite-sand slurry [ ] 35
_____ Lbs/gal mud weight ..... Bentonite slurry [ ] 31
_____ % Bentonite .... Bentonite-cement grout [ ] 50
13.5 Ft³ volume added for any of the above
How installed: Tremie [ ] 01; Tremie pumped [ ] 02; Gravity [X] 08
6. Bentonite seal: Bentonite granules [ ] 33
[X] 1/4 in. [ ] 3/8 in. [ ] 1/2 in. Bentonite pellets [X] 32; Other [ ]
7. Fine sand material: Manufacturer, product name and mesh size
Ottowa Sand
Volume added 0.4 ft³
8. Filter pack material: Manufacturer, product name and mesh size
Waupaca Materials No. 30 Flint
Volume added 3.5 ft³
9. Well casing: Flush threaded PVC schedule 40 [ ] 23; Flush threaded PVC schedule 80 [X] 24; Other [ ]
10. Screen material: Sch. 80 PVC
Screen type: Factory cut [X] 11; Continuous slot [ ] 01; Other [ ]
Manufacturer: Northern Air & Supply
Slot size: 0.010 in.
Slotted length: 13.5 ft.
11. Backfill material (below filter pack): None [X]; Other [ ]

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature: Kyle Thornton Firm: Central Wisconsin Engineers

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with s. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with s. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation.
NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. W. ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY	Local Grid Location of Well: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.	Well Name: MW-5
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. _____ Long. _____ or	Wis. Unique Well Number / DNR Well Number: _____
Type of Well: Water Table Observation Well ■ 11; Piezometer ☐ 12	St. Plane _____ ft. N, _____ ft. E.	Date Well Installed: 02/16/88 (m m d d y y)
Distance Well Is From Waste/Source Boundary: _____ ft.	Section Location of Waste/Source: SW 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4 ☐ E. ■ W.	Well Installed By: (Person's Name and Firm): ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	

A. Protective pipe, top elevation 1226.50 ft. MSL
B. Well casing, top elevation 1225.32 ft. MSL
C. Land surface elevation 1223.2 ft. MSL
D. Surface seal, bottom 1218.2 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ■

13. Sieve analysis attached? ☐ Yes ■ No

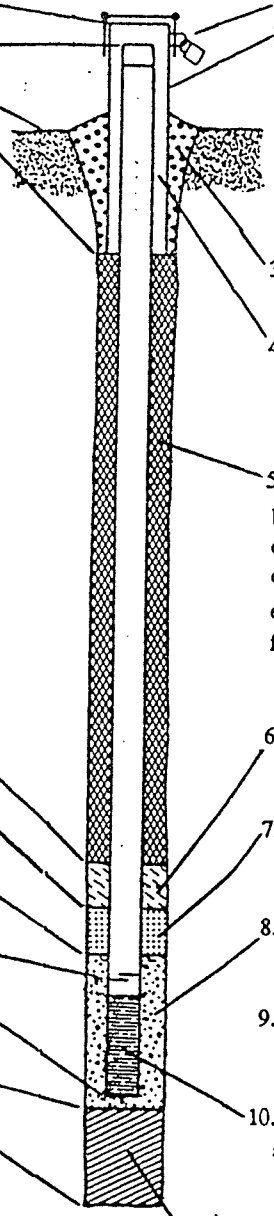
14. Drilling method used: Rotary ■ 50; Hollow Stem Auger ■ 41; Other ☐ _____

15. Drilling fluid used: Water ☐ 02; Air ■ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ■ Yes ☐ No
Describe QUICK FOAM

17. Source of water (attach analysis):
HILLSBORO CITY WATER

E. Bentonite seal, top 1102.6 ft. MSL or 120.6 ft.
F. Fine sand, top _____ ft. MSL or _____ ft.
G. Filter pack, top 1091.6 ft. MSL or 131.6 ft.
H. Screen joint, top 1082.6 ft. MSL or 140.6 ft.
I. Well bottom 1072.6 ft. MSL or 150.6 ft.
J. Filter pack, bottom _____ ft. MSL or _____ ft.
K. Borehole, bottom 1043.2 ft. MSL or 180.0 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.80 in.



1. Cap and lock? ■ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 5.0 ft.
c. Material: Steel ■ 04; Other ☐ _____
d. Additional protection? ☐ Yes ■ No
If yes, describe: _____
3. Surface seal: Bentonite ☐ 30; Concrete ■ 01; Other ☐ _____
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ _____; Other ☐ _____
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 50 % Bentonite . . . . . Bentonite-cement grout ■ 50
e. 40.10 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☐ 3/8 in. ■ 1/2 in. Bentonite pellets ■ 32
c. VOLCLAY Other ☐ _____
7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 18.09 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ■ 24; Other ☐ _____
10. Screen material: PVC Sch 80
a. Screen type: Factory cut ■ 11; Continuous slot ☐ 01; Other ☐ _____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☐ 14; Other ☐ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: William R Klein
Firm: CENTRAL WISCONSIN ENGINEERS, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route To: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 4.90

Facility/Project Name *Vernon Co. Balefill*	**Local Grid Location of Well** *1261.80 Feet N, 1691.28 Feet E*	**Well Name** *MW-14Z*
Facility License, Permit or Monitoring Number *03268*	**Grid Origin Location**	**Wis. Unique Well Number** *JX073* **DNR Well Number** *119*
Type of Well Water Table Observation Well ☐ 11 Piezometer ☒ 12	**Section Location of Waste/Source** *SW 1/4, SE 1/4, Sec. 15, T13N, R4E*	**Date Well Installed** *03/07/2003*
Distance Well is From Waste/Source Boundary *115 ft.*	**Location of Well Relative to Waste/Source** u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	**Well Installed By: (Person's Name and Firm)** *Daryl Karasch* *Traut Hydro Tech*
Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No		

A. Protective pipe, top elevation 1250.5 ft. MSL
B. Well casing, top elevation 1250.22 ft. MSL
C. Land surface elevation 1247.5 ft. MSL
D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS Classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

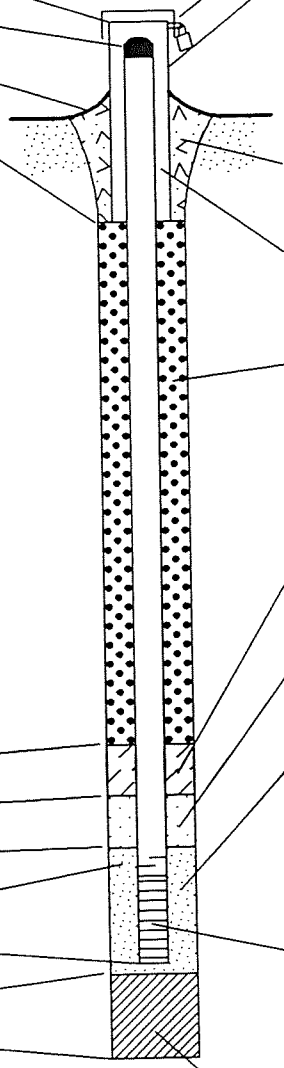
14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☐ 41
x _____ Other ☒ Versa Sonic

15. Drilling fluid used: Water ☒ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water *(attach analysis)*:
Viroqua

E. Bentonite seal, top _____ ft. MSL or 194.5 ft.
F. Fine sand, top _____ ft. MSL or 199.5 ft.
G. Filter pack, top _____ ft. MSL or 201.5 ft.
H. Screen joint, top _____ ft. MSL or 203.5 ft.
I. Well bottom _____ ft. MSL or 208.5 ft.
J. Filter pack, bottom _____ ft. MSL or 210 ft.
K. Borehole, bottom _____ ft. MSL or 210 ft.
L. Borehole, diameter 7.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.94 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 7 ft.
c. Material: Steel ☐ 04
Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☒ 30
Concrete ☐ 01
_____ Other ☐
4. Material between well casing and protective pipe:
Bentonite ☒ 30
Annular space seal ☐
_____ Other ☐
5. Annular space seal: a. Granular Bentonite ☐ 33
b. ____ Lbs/gal mud weight ..... Bentonite-sand slurry ☒ 35
c. ____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
d. ____ % Bentonite ..... Bentonite-cement grout ☐ 50
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☒ 02
Gravity ☐ 08
6. Bentonite seal: a. Bentonite Granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
c. _____ Other ☐
7. Fine sand material: Manufacturer, product name and mesh size
a. Unimin #70
b. Volume added 0.66 ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. Red Flint #40
b. Volume added 2.2 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23
Flush threaded PVC schedule 80 ☒ 24
_____ Other ☐
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
_____ Other ☐
b. Manufacturer Johnson
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☒ 14
_____ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm Central Wisconisn Engineers & Architects

Please complete both sides of this form and return to the appropriate DNR office listted at the top of this form as required by chs. 144, 147 and 160 Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144 Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147 Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

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Monitoring Wells and Piezometers within 150-feet of Landfill Expansion

State of Wisconsin
epartment of Natural Resources

Route To: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4.90

Facility/Project Name *Vernon Co. Balefill*	**Local Grid Location of Well** *1275.90 Feet N, 1678.68 Feet E*	**Well Name** *MW-14*
Facility License, Permit or Monitoring Number *03268*	**Grid Origin Location**	**Wis. Unique Well Number** *JX072* **DNR Well Number** *118*
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	**Section Location of Waste/Source** *SW 1/4, SE 1/4, Sec. 15, T13N, R4E*	**Date Well Installed** *03/12/2003*
Distance Well is From Waste/Source Boundary *100 ft.*	**Location of Well Relative to Waste/Source** u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	**Well Installed By: (Person's Name and Firm)** *Daryl Karasch* *Traut Hydro Tech*
s Well A Point of Enforcement Std. Application? ☐ Yes ☒ No		

A. Protective pipe, top elevation 1250.0 ft. MSL
B. Well casing, top elevation 1249.69 ft. MSL
C. Land surface elevation 1247.5 ft. MSL
D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS Classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

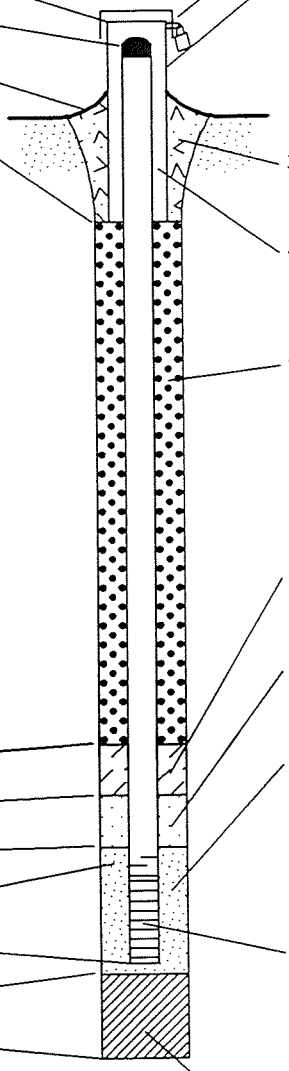
14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☐ 41
x _____ Other ☒ Versa Sonic

15. Drilling fluid used: Water ☒ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water *(attach analysis)*:
City of Viroqua Airport

E. Bentonite seal, top _____ ft. MSL or 161 ft.
F. Fine sand, top _____ ft. MSL or 166 ft.
G. Filter pack, top _____ ft. MSL or 168 ft.
H. Screen joint, top _____ ft. MSL or 170 ft.
I. Well bottom _____ ft. MSL or 185 ft.
J. Filter pack, bottom _____ ft. MSL or 185 ft.
K. Borehole, bottom _____ ft. MSL or 190 ft.
L. Borehole, diameter 7.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.94 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 7 ft.
c. Material: Steel ☐ 04
Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☒ 30
Concrete ☐ 01
_____ Other ☐
4. Material between well casing and protective pipe:
Bentonite ☒ 30
Annular space seal ☐
_____ Other ☐
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight ..... Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight ..... Bentonite slurry ☒ 31
d. _____ % Bentonite ..... Bentonite-cement grout ☐ 50
e. _____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☒ 02
Gravity ☐ 08
6. Bentonite seal: a. Bentonite Granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
c. _____ Other ☐
7. Fine sand material: Manufacturer, product name and mesh size
a. Unimin #70
b. Volume added 0.66 ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. Red Flint #40
b. Volume added 5.9 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23
Flush threaded PVC schedule 80 ☒ 24
_____ Other ☐
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
_____ Other ☐
b. Manufacturer Johnson
c. Slot size: 0.010 in.
d. Slotted length: 15 ft.
11. Backfill material (below filter pack): None ☐ 14
Sand #30 Other ☒

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Retted Trautsen | Firm Central Wisconisn Engineers & Architects

Please complete both sides of this form and return to the appropriate DNR office listted at the top of this form as required by chs. 144, 147 and 160 Wis. tats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144 Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more ian $5000 for each day of violation. In accordance with ch. 147 Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for ach day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

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Monitoring Wells and Piezometers within 300-feet of Landfill Expansion

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY	Local Grid Location of Well: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.	Well Name: MW-3
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. _____ Long. _____ or St. Plane _____ ft. N, _____ ft. E.	Wis. Unique Well Number / DNR Well Number
Type of Well: Water Table Observation Well ☐ 11; Piezometer ■ 12	Section Location of Waste/Source: NW 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4 ☐ E. ☒ W.	Date Well Installed: 02/01/88 (m m d d y y)
Distance Well Is From Waste/Source Boundary: _____ ft.	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient; d ☐ Downgradient n ☐ Not Known	Well Installed By: (Person's Name and Firm): ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No		

A. Protective pipe, top elevation 1235.39 ft. MSL
B. Well casing, top elevation 1235.37 ft. MSL
C. Land surface elevation 1233.1 ft. MSL
D. Surface seal, bottom 1228.1 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ■

13. Sieve analysis attached? ☐ Yes ■ No

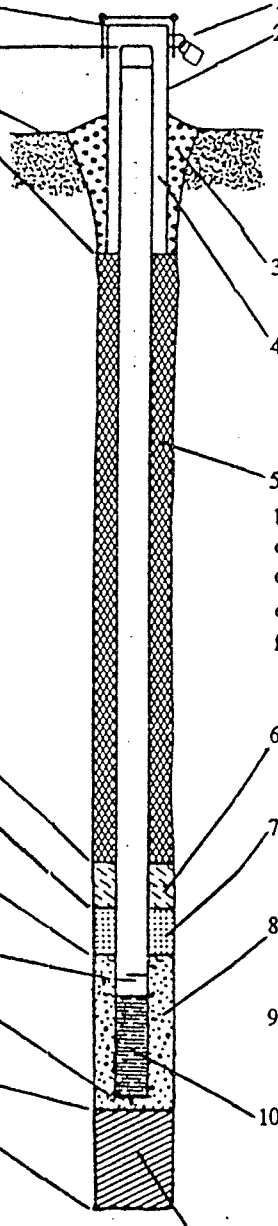
14. Drilling method used: Rotary ■ 50; Hollow Stem Auger ☐ 41; Other ☐ ___ _____

15. Drilling fluid used: Water ☐ 02; Air ■ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ■ Yes ☐ No
Describe QUIK FOAM

17. Source of water (attach analysis):
HILLSBORO CITY WATER

E. Bentonite seal, top 1071.1 ft. MSL or 161.4 ft.
F. Fine sand, top _____ ft. MSL or _____ ft.
G. Filter pack, top 1061.2 ft. MSL or 165.9 ft.
H. Screen joint, top 1058.2 ft. MSL or 174.9 ft.
I. Well bottom 1053.2 ft. MSL or 179.9 ft.
J. Filter pack, bottom _____ ft. MSL or _____ ft.
K. Borehole, bottom 1053.1 ft. MSL or 180.0 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.80 in.



1. Cap and lock? ■ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 4.0 ft.
c. Material: Steel ■ 04; Other ☐ ___ _____
d. Additional protection? ☐ Yes ■ No
If yes, describe: _____
3. Surface seal: Bentonite ☐ 30; Concrete ■ 01; Other ☐ ___ _____
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ ___; Other ☐ ___ _____
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 50 % Bentonite . . . . . Bentonite-cement grout ■ 50
e. 53.74 Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ■ 02; Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☐ 3/8 in. ■ 1/2 in. Bentonite pellets ☐ 32
c. VOLCLAY Other ☐ ___ _____
7. Fine sand material: Manufacturer, product name & mesh size
a. _____ ___ ___
b. Volume added _____ ft³
8. Filter pack material: Manufacturer, product name and mesh size
a. SAND ___ ___
b. Volume added 8.1 ft³
9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ■ 24; Other ☐ ___ _____
10. Screen material: PVC SCH 80 ___ ___
a. Screen type: Factory cut ■ 11; Continuous slot ☐ 01; Other ☐ ___ _____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: ___.__ ft.
11. Backfill material (below filter pack): None ☐ 14; Other ☐ ___ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: William R Vach | Firm: CENTRAL WISCONSIN ENGINEERS INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY

Facility License, Permit or Monitoring Number: _____

Type of Well: Water Table Observation Well ■ 11 ☐ Piezometer ☐ 12

Distance Well Is From Waste/Source Boundary: _____ ft.

Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No

Local Grid Location of Well: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Grid Origin Location: Lat. _____ Long. _____ or

St. Plane _____ ft. N, _____ ft. E.

Section Location of Waste/Source: NW 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4 ☐ E. ■ W.

Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known

Well Name: MW-4

Wis. Unique Well Number: _____ DNR Well Number: _____

Date Well Installed: 01/28/88 (m m d d y y)

Well Installed By: (Person's Name and Firm): ACE WELL

A. Protective pipe, top elevation 1235.31 ft. MSL

B. Well casing, top elevation 1235.01 ft. MSL

C. Land surface elevation 1233.2 ft. MSL

D. Surface seal, bottom 1228.2 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ■

13. Sieve analysis attached? ☐ Yes ■ No

14. Drilling method used: Rotary ■ 50; Hollow Stem Auger ☐ 41; Other ☐ _____

15. Drilling fluid used: Water ☐ 02; Air ■ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ■ Yes ☐ No

Describe QUICK FOAM

17. Source of water (attach analysis):
HILLSBORO CITY WELL

E. Bentonite seal, top 1099.7 ft. MSL or 133.5 ft.

F. Fine sand, top _____ ft. MSL or _____ ft.

G. Filter pack, top 1096.9 ft. MSL or 136.3 ft.

H. Screen joint, top 1089.2 ft. MSL or 144.0 ft.

I. Well bottom 1079.2 ft. MSL or 154.0 ft.

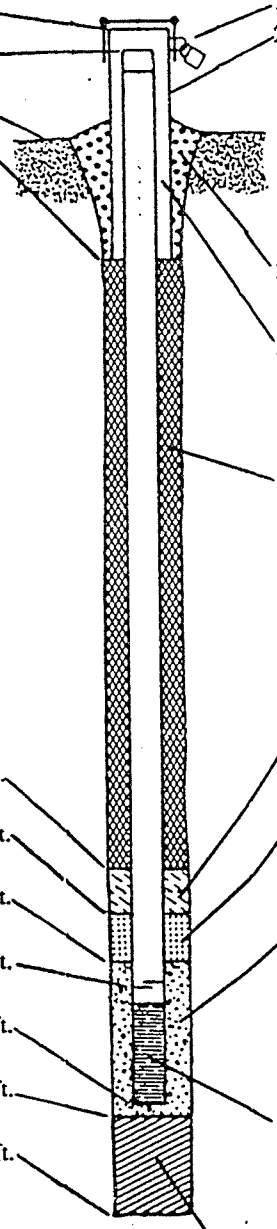
J. Filter pack, bottom _____ ft. MSL or _____ ft.

K. Borehole, bottom 1073.2 ft. MSL or 160.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 2.00 in.



1. Cap and lock? ■ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 1.0 ft.
c. Material: Steel ■ 04; Other ☐ _____
d. Additional protection? ☐ Yes ■ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ■ 01; Other ☐ _____

4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ _____; Other ☐ _____

5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
d. 50 % Bentonite ..... Bentonite-cement grout ■ 50
e. 26.7 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ■ 02; Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☐ 3/8 in. ■ 1/2 in. Bentonite pellets ■ 32
c. VOLCLAY Other ☐ _____

7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft^3

8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 5.4 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ■ 24; Other ☐ _____

10. Screen material: PVC Sch 80
a. Screen type: Factory cut ■ 11; Continuous slot ☐ 01; Other ☐ _____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.

11. Backfill material (below filter pack): None ☐ 14; Other ☐ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: William R Vach Firm: CENTRAL WISCONSIN ENGINEERS.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY

Facility License, Permit or Monitoring Number: _____

Type of Well: Water Table Observation Well ■ 11; Piezometer ☐ 12

Distance Well Is From Waste/Source Boundary: _____ ft.

Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No

Local Grid Location of Well: _____ ft. ☐N ☐S _____ ft. ☐E ☐W

Grid Origin Location: Lat. _____ Long. _____ or

St. Plane _____ ft. N, _____ ft. E.

Section Location of Waste/Source: NW 1/4 of SE 1/4 of Sec. 15 T. 13 N, R. 4 ☐E ■W

Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient; d ☐ Downgradient n ☐ Not Known

Well Name: MW-4P

Wis. Unique Well Number: _____ DNR Well Number: _____

Date Well Installed: 01/28/88 (m m d d y y)

Well Installed By: (Person's Name and Firm): ACE WELL

A. Protective pipe, top elevation 1235.31 ft. MSL

B. Well casing, top elevation 1235.19 ft. MSL

C. Land surface elevation 1233.2 ft. MSL

D. Surface seal, bottom 1228.2 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ■

13. Sieve analysis attached? ☐ Yes ■ No

14. Drilling method used: Rotary ■ 50; Hollow Stem Auger ☐ 41; Other ☐ ____

15. Drilling fluid used: Water ☐ 02; Air ■ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ■ Yes ☐ No

Describe QUICK FOAM

17. Source of water (attach analysis):
HILLSBORO CITY WATER

E. Bentonite seal, top 1159.1 ft. MSL or 74.1 ft.

F. Fine sand, top _____ ft. MSL or _____ ft.

G. Filter pack, top 1156.1 ft. MSL or 77.1 ft.

H. Screen joint, top 1148.3 ft. MSL or 84.9 ft.

I. Well bottom 1138.3 ft. MSL or 94.9 ft.

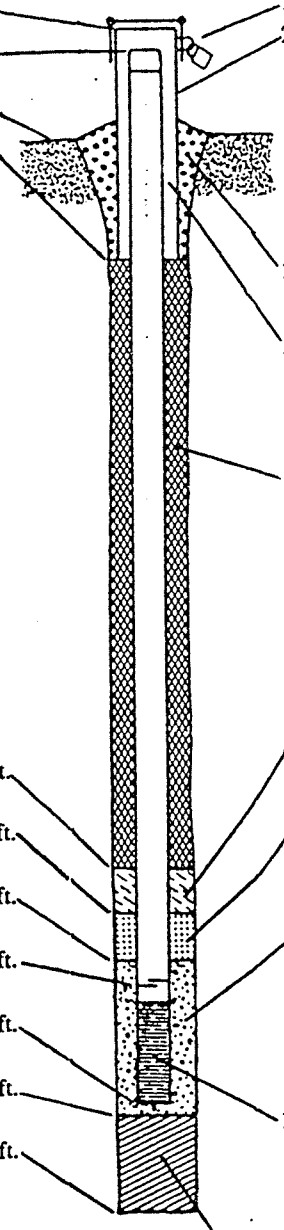
J. Filter pack, bottom _____ ft. MSL or _____ ft.

K. Borehole, bottom 1073.2 ft. MSL or 160.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 1.80 in.



1. Cap and lock? ■ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 4.0 ft.
c. Material: Steel ■ 04; Other ☐ ____
d. Additional protection? ☐ Yes ☐ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ■ 01; Other ☐ ____

4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ ____; Other ☐ ____

5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 50 % Bentonite . . . . . Bentonite-cement grout ■ 50
e. 26.7 Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ■ 02; Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ■1/2 in. Bentonite pellets ■ 32
c. VOLCLAY Other ☐ ____

7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft³

8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 12.15 ft³

9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ■ 24; Other ☐ ____

10. Screen material: PVC Sch 80
a. Screen type: Factory cut ■ 11; Continuous slot ☐ 01; Other ☐ ____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.

11. Backfill material (below filter pack): None ☐ 14; Other ☐ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: William Roach Firm: CENTRAL WISCONSIN ENGINEERS

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY	Local Grid Location of Well: _____ ft. ☐N ☐S _____ ft. ☐E ☐W	Well Name: MW-6
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. _____ Long. _____ or St. Plane _____ ft. N, _____ ft. E.	Wis. Unique Well Number / DNR Well Number: _____ / _____
Type of Well: Water Table Observation Well ☐ 11; Piezometer ☒ 12	Section Location of Waste/Source: NW 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4 ☐E ☒W	Date Well Installed: 02/19/88 (mm dd yy)
Distance Well Is From Waste/Source Boundary: _____ ft.	Location of Well Relative to Waste/Source: u ☐ Upgradient; s ☐ Sidegradient; d ☐ Downgradient; n ☐ Not Known	Well Installed By: (Person's Name and Firm) ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No		

A. Protective pipe, top elevation 1235.47 ft. MSL

B. Well casing, top elevation 1235.7 ft. MSL

C. Land surface elevation 1233.0 ft. MSL

D. Surface seal, bottom 1228.0 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50; Hollow Stem Auger ☐ 41; Other ☐ ____

15. Drilling fluid used: Water ☐ 02; Air ☒ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ☒ Yes ☐ No
Describe QUIK FOAM

17. Source of water (attach analysis):
HILLSBORO CITY WELL

E. Bentonite seal, top 1046.0 ft. MSL or 187.0 ft.

F. Fine sand, top _____ ft. MSL or _____ ft.

G. Filter pack, top 1042.0 ft. MSL or 191.0 ft.

H. Screen joint, top 1035.7 ft. MSL or 197.3 ft.

I. Well bottom 1025.7 ft. MSL or 2023 ft.

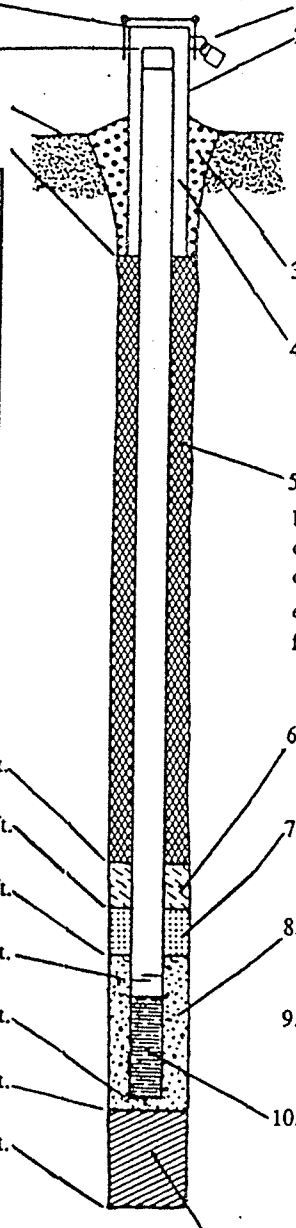
J. Filter pack, bottom _____ ft. MSL or _____ ft.

K. Borehole, bottom 1023.0 ft. MSL or 210.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 1.80 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 4.0 ft.
c. Material: Steel ☒ 04; Other ☐ ____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ ____

4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ ____; Other ☐ ____

5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
d. 50 % Bentonite ..... Bentonite-cement grout ☒ 50
e. 80.2 Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☒ 02; Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ☒1/2 in. Bentonite pellets ☒ 32
c. VOLCLAY Other ☐ ____

7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft³

8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 6.75 ft³

9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ☒ 24; Other ☐ ____

10. Screen material: Sch 80 PVC
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: ___ ft.

11. Backfill material (below filter pack): None ☐ 14; Other ☐ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: _____ Firm: CENTRAL WISCONSIN ENGINEERS

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ite of Wisconsin
partment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Vernon Co.

ility License, Permit or Monitoring Number: 03268__

Grid Location: 215.7 ft. [X] N. [ ] S.; 1656.6 ft. [X] E. [ ] W.

Well Name: MW-10

Wis. Unique Well Number: ____ DNR Well Number: ____

ype of Well: Water Table Observation Well [ ] 11; Piezometer [X] 12

Section Location: SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 [ ] E [X] W

Date Well Installed: 09/15/89 (m m d d y y)

tance Well Is From Waste/Source Boundary: 140' From Prop. Waste Limit ft.

Well Installed By: (Person's Name and Firm): Gus Pech; Exploration Technology Inc.

Is Well A Point of Enforcement Std. Application? [X] Yes [ ] No

Location of Well Relative to Waste/Source: [X] Upgradient [ ] Sidegradient [ ] Downgradient [ ] Not Known

A. Protective pipe, top elevation 1217.50 ft. MSL

B. Well casing, top elevation 1217.45 ft. MSL

C. Land surface elevation 1215.6 ft. MSL

D. Surface seal, bottom 1041.0 ft. MSL or 176.5 ft.

11. USCS classification of soil near screen:
[ ] GP [ ] GM [ ] GC [ ] GW [ ] SW [ ] SP
[ ] SM [ ] SC [ ] ML [ ] MH [ ] CL [ ] CH
[X] Bedrock

12. Sieve analysis attached? [ ] Yes [X] No

13. Drilling method used: Rotary [X] 50; Hollow Stem Auger [ ] 41; Other [ ] ____

14. Drilling fluid used: Water [ ] 02; Air [ ] 01; Drilling Mud [X] 03; None [ ] 99

15. Drilling additives used? [ ] Yes [X] No

Describe ____

17. Source of water (attach analysis):
City of Wiroqua Municipal Water

E. Bentonite seal, top N/A ft. MSL or N/A ft.

F. Fine sand, top 1041.0 ft. MSL or 176.5 ft.

G. Filter pack, top 1039.0 ft. MSL or 178.5 ft.

H. Well screen, top 1039.0 ft. MSL or 178.5 ft.

I. Well screen, bottom 1034.0 ft. MSL or 183.5 ft.

J. Filter pack, bottom 1034.0 ft. MSL or 183.5 ft.

K. Borehole, bottom 1033.5 ft. MSL or 184.5 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 2.00 in.

1. Cap and lock? [X] Yes [ ] No

2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel [X] 04; Other [ ] ____
d. Additional protection? [ ] Yes [X] No
If yes, describe: ____

3. Surface seal: Bentonite [X] 30; Concrete [ ] 01; Other [ ] ____

4. Material between well casing and protective pipe: Bentonite [X] 30; Annular space seal [ ]; Other [ ] ____

5. Annular space seal: Granular Bentonite [X] 33
____ Lbs/gal mud weight ... Bentonite-sand slurry [ ] 35
____ Lbs/gal mud weight ..... Bentonite slurry [ ] 31
____ % Bentonite .... Bentonite-cement grout [ ] 50
29.5 Ft^3 volume added for any of the above
How installed: Tremie [ ] 01; Tremie pumped [ ] 02; Gravity [X] 08

6. Bentonite seal: Bentonite granules [ ] 33
[ ] 1/4 in. [ ] 3/8 in. [ ] 1/2 in. Bentonite pellets [ ] 32
No. 8 Bentonite Hole Plug Other [X]

7. Fine sand material: Manufacturer, product name and mesh size
Ottowa Sand
Volume added 0.4 ft^3

8. Filter pack material: Manufacturer, product name and mesh size
Waupaca Materials No. 30 Flint
Volume added 0.9 ft^3

9. Well casing: Flush threaded PVC schedule 40 [ ] 23; Flush threaded PVC schedule 80 [X] 24; Other [ ] ____

10. Screen material: Sch. 80 PVC
Screen type: Factory cut [X] 11; Continuous slot [ ] 01; Other [ ] ____
Manufacturer Northern Air & Supply
Slot size: 0.010 in.
Slotted length: 4.5 ft.

11. Backfill material (below filter pack): None [ ]
No. 30 Flint Sand Other [ ]

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Kirk Thornton Firm: Central Wisconsin Engineers

ease complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with . 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance d h. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation.

OTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Vernon Co.
Facility License, Permit or Monitoring Number: 03268__

Grid Location: 204.8 ft. [X] N. [ ] S.; 1652.4 ft. [X] E. [ ] W.

Well Name: MW-11
Wis. Unique Well Number: ____ DNR Well Number: ____

Type of Well: Water Table Observation Well [ ] 11; Piezometer [X] 12

Section Location: SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 [ ] E [X] W

Date Well Installed: 09 / 29 / 89 (m m / d d / y y)

Distance Well Is From Waste/Source Boundary: 150' From Prop. Waste Units ft.

Well A Point of Enforcement Std. Application? [X] Yes [ ] No

Location of Well Relative to Waste/Source: [X] Upgradient [ ] Sidegradient [ ] Downgradient [ ] Not Known

Well Installed By: (Person's Name and Firm)
Gus Pech
Exploration Technology, Inc.

A. Protective pipe, top elevation 1218.00 ft. MSL
B. Well casing, top elevation 1218.54 ft. MSL
C. Land surface elevation 1216.4 ft. MSL
D. Surface seal, bottom 1080.0 ft. MSL or 138.5 ft.

USCS classification of soil near screen:
[ ] GP [ ] GM [ ] GC [ ] GW [ ] SW [ ] SP
[ ] SM [ ] SC [ ] ML [ ] MH [ ] CL [ ] CH
[X] Bedrock

13. Sieve analysis attached? [ ] Yes [X] No

14. Drilling method used: Rotary [X] 50; Hollow Stem Auger [ ] 41; Other [ ] ____

15. Drilling fluid used: Water [ ] 02; Air [ ] 01; Drilling Mud [X] 03; None [ ] 99

16. Drilling additives used? [ ] Yes [X] No

Describe ____

17. Source of water (attach analysis): ____

E. Bentonite seal, top N/A ft. MSL or N/A ft.
F. Fine sand, top 1080.0 ft. MSL or 138.5 ft.
G. Filter pack, top 1077.0 ft. MSL or 141.5 ft.
H. Well screen, top 1071.0 ft. MSL or 147.5 ft.
I. Well screen, bottom 1056.0 ft. MSL or 162.5 ft.
J. Filter pack, bottom 1056.0 ft. MSL or 162.5 ft.
K. Borehole, bottom 1053.0 ft. MSL or 165.5 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 2.00 in.

1. Cap and lock? [X] Yes [ ] No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel [X] 04; Other [ ] ____
d. Additional protection? [ ] Yes [X] No
If yes, describe: ____
3. Surface seal: Bentonite [X] 30; Concrete [ ] 01; Other [ ] ____
4. Material between well casing and protective pipe: Bentonite [X] 30; Annular space seal [ ]; Other [ ] ____
5. Annular space seal: Granular Bentonite [X] 33
____ Lbs/gal mud weight ... Bentonite-sand slurry [ ] 35
____ Lbs/gal mud weight ..... Bentonite slurry [ ] 31
____ % Bentonite .... Bentonite-cement grout [ ] 50
23.0 Ft^3 volume added for any of the above
How installed: Tremie [X] 01; Tremie pumped [ ] 02; Gravity [X] 08
6. Bentonite seal: Bentonite granules [ ] 33
[ ] 1/4 in. [ ] 3/8 in. [ ] 1/2 in. Bentonite pellets [ ] 32
No. 8 Bentonite Hole Plug Other [X] ____
7. Fine sand material: Manufacturer, product name and mesh size
Ottowa Sand
Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name and mesh size
Waupaca Materials No. 30 Flint
Volume added 5.5 ft^3
9. Well casing: Flush threaded PVC schedule 40 [ ] 23; Flush threaded PVC schedule 80 [X] 24; Other [ ] ____
10. Screen material: Sch. 80 PVC
Screen type: Factory cut [X] 11; Continuous slot [ ] 01; Other [ ] ____
Manufacturer: Northern Air & Supply
Slot size: 0.010 in.
Slotted length: 13.5 ft.
11. Backfill material (below filter pack): None [ ]
No. 30 Flint Sand Other [ ]

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature: Kirk Thornton
Firm: Central Wisconsin Engineers

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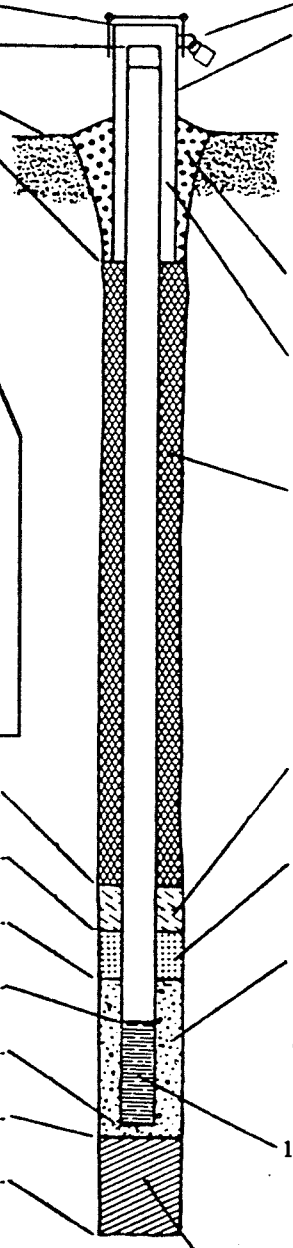
State of Wisconsin
partment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

acility/Project Name: Vernon Co.	Grid Location: 200.0 ft. [X] N. [ ] S.; 1647.2 ft. [X] E. [ ] W.	Well Name: MW-12
ility License, Permit or Monitoring Number: 03268		Wis. Unique Well Number: ____ DNR Well Number: ____
Type of Well: Water Table Observation Well [X] 11; Piezometer [ ] 12	Section Location: SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 [ ] E [X] W	Date Well Installed: 09 / 22 / 89 (m m / d d / y y)
tance Well Is From Waste/Source Boundary: 155' From Prop. Waste Limits ft.	Location of Well Relative to Waste/Source: [X] Upgradient [ ] Sidegradient; [ ] Downgradient [ ] Not Known	Well Installed By: (Person's Name and Firm): Gus Pech; Exploration Technology, Inc.
s Well A Point of Enforcement Std. Application? [X] Yes [ ] No		

A. Protective pipe, top elevation 1218.10 ft. MSL
B. Well casing, top elevation 1218.36 ft. MSL
C. Land surface elevation 1216.4 ft. MSL
D. Surface seal, bottom 1142.9 ft. MSL or 75.5 ft.
E. USCS classification of soil near screen:
[ ] GP [ ] GM [ ] GC [ ] GW [ ] SW [ ] SP
[ ] SM [ ] SC [ ] ML [ ] MH [ ] CL [ ] CH
[X] Bedrock
F. Sieve analysis attached? [ ] Yes [X] No
G. Drilling method used: Rotary [X] 50; Hollow Stem Auger [ ] 41; Other [ ]
H. Drilling fluid used: Water [ ] 02; Air [ ] 01; Drilling Mud [X] 03; None [ ] 99
I. Drilling additives used? [ ] Yes [X] No
Describe
J. Source of water (attach analysis):
City of Viroqua Numicipal Water

K. Bentonite seal, top 1142.9 ft. MSL or 75.5 ft.
L. Fine sand, top 1140.9 ft. MSL or 77.5 ft.
M. Filter pack, top 1138.9 ft. MSL or 79.5 ft.
N. Well screen, top 1134.9 ft. MSL or 83.5 ft.
O. Well screen, bottom 1119.9 ft. MSL or 98.5 ft.
P. Filter pack, bottom 1119.9 ft. MSL or 98.5 ft.
Q. Borehole, bottom 1112.9 ft. MSL or 105.5 ft.
R. Borehole, diameter 6.0 in.
S. O.D. well casing 2.40 in.
T. I.D. well casing 2.00 in.



1. Cap and lock? [X] Yes [ ] No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel [X] 04; Other [ ]
d. Additional protection? [ ] Yes [X] No
If yes, describe:
3. Surface seal: Bentonite [X] 30; Concrete [ ] 01; Other [ ]
4. Material between well casing and protective pipe: Bentonite [X] 30; Annular space seal [ ]; Other [ ]
5. Annular space seal: Granular Bentonite [X] 33
____ Lbs/gal mud weight . . . Bentonite-sand slurry [ ] 35
____ Lbs/gal mud weight . . . . . Bentonite slurry [ ] 31
____ % Bentonite . . . . . Bentonite-cement grout [ ] 50
12.5 Ft^3 volume added for any of the above
How installed: Tremie [ ] 01; Tremie pumped [ ] 02; Gravity [X] 08
6. Bentonite seal: Bentonite granules [ ] 33
[ ] 1/4 in. [ ] 3/8 in. [ ] 1/2 in. Bentonite pellets [ ] 32
No. 8 Bentonite Hole Plug Other [X]
7. Fine sand material: Manufacturer, product name and mesh size
Ottowa Sand
Volume added 0.4 ft^3
8. Filter pack material: Manufacturer, product name and mesh size
Waupaca Materials. No. 30 Flint
Volume added 3.2 ft^3
9. Well casing: Flush threaded PVC schedule 40 [ ] 23; Flush threaded PVC schedule 80 [X] 24; Other [ ]
10. Screen material: Sch. 80 PVC
Screen type: Factory cut [X] 11; Continuous slot [ ] 01; Other [ ]
Manufacturer Northern Air & Supply
Slot size: 0.010 in.
Slotted length: 13.5 ft.
11. Backfill material (below filter pack): None [ ]
No. 30 Flint Sand Other [ ]

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature: Kirk Thorton Firm: Central Wisconsin Engineers

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation.
NOTE: Shaded areas are for DNR use only. See instructions for more information.

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Monitoring Wells and Piezometers outside 300-feet of Landfill Expansion

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY	Local Grid Location of Well: _____ ft. ☐N ☐S. _____ ft. ☐E ☐W	Well Name: MW# 1
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. _____ Long. _____ or St. Plane _____ ft. N, _____ ft. E.	Wis. Unique Well Number / DNR Well Number
Type of Well: Water Table Observation Well ■ 11; Piezometer ☐ 12		Date Well Installed: 12/29/87 (mm dd yy)
Distance Well Is From Waste/Source Boundary: _____ ft.	Section Location of Waste/Source: SE 1/4 of SW 1/4 of Sec. 15, T. 13 N, R. 4 ☐E ■W	Well Installed By: (Person's Name and Firm): ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	

A. Protective pipe, top elevation 1238.90 ft. MSL
B. Well casing, top elevation 1238.11 ft. MSL
C. Land surface elevation 1236.4 ft. MSL
D. Surface seal, bottom 1231.4 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ■

13. Sieve analysis attached? ☐ Yes ■ No

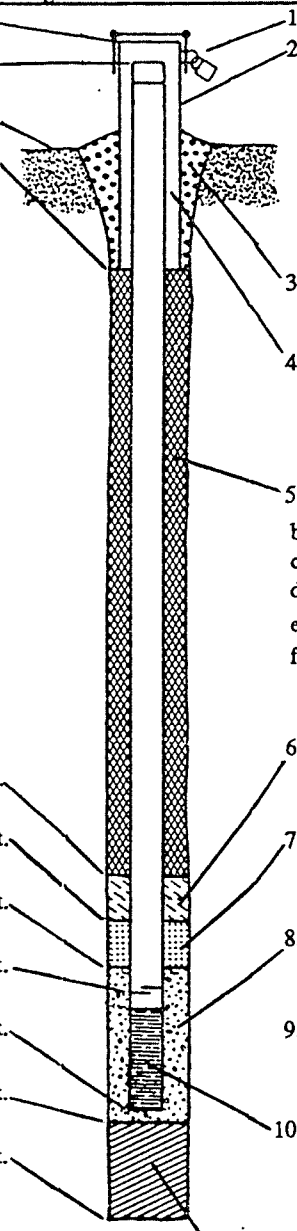
14. Drilling method used: Rotary ■ 50; Hollow Stem Auger ☐ 41; Other ☐ ____

15. Drilling fluid used: Water ☐ 02; Air ■ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ■ Yes ☐ No
Describe QUICK FOAM (NL BAROID)

17. Source of water (attach analysis):
HILLSBORO CITY WELL

E. Bentonite seal, top 1102.1 ft. MSL or 134.3 ft.
F. Fine sand, top _____ ft. MSL or _____ ft.
G. Filter pack, top 1094.3 ft. MSL or 142.1 ft.
H. Screen joint, top 1088.5 ft. MSL or 147.9 ft.
I. Well bottom 1078.5 ft. MSL or 157.9 ft.
J. Filter pack, bottom _____ ft. MSL or _____ ft.
K. Borehole, bottom 1036.4 ft. MSL or 200.0 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.80 in.



1. Cap and lock? ■ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 4.0 ft.
c. Material: Steel ■ 04; Other ☐ ____
d. Additional protection? ☐ Yes ☐ No
If yes, describe: _____
3. Surface seal: Bentonite ☐ 30; Concrete ■ 01; Other ☐ ____
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ ____; Other ☐ ____
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 50 % Bentonite . . . . . Bentonite-cement grout ■ 50
e. 93.58 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ■ 02; Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ■1/2 in. Bentonite pellets ■ 32
c. VOLCLAY PELLETS Other ☐ ____
7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 13.5 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ■ 24; Other ☐ ____
10. Screen material: PVC Sch 80
a. Screen type: Factory cut ■ 11; Continuous slot ☐ 01; Other ☐ ____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☐ 14; Other ☐ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: William R Vock | Firm: CENTRAL WISCONSIN ENGINEERS, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY	Local Grid Location of Well: _____ ft. ☐N ☐S _____ ft. ☐E ☐W	Well Name: MW - 1P
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. _____ Long. _____ or St. Plane _____ ft. N, _____ ft. E.	Wis. Unique Well Number / DNR Well Number: _____ / _____
Type of Well: Water Table Observation Well ■ 11; Piezometer ☐ 12	Section Location of Waste/Source: SE 1/4 of SW 1/4 of Sec. 15, T. 13 N, R. 4 ☐E ■W	Date Well Installed: 12/29/87 (m m d d y y)
Distance Well Is From Waste/Source Boundary: _____ ft.	Location of Well Relative to Waste/Source: u ☐ Upgradient; s ☐ Sidegradient; d ☐ Downgradient; n ☐ Not Known	Well Installed By: (Person's Name and Firm): ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No		

A. Protective pipe, top elevation 1238.90 ft. MSL

B. Well casing, top elevation 1238.41 ft. MSL

C. Land surface elevation 1236.4 ft. MSL

D. Surface seal, bottom 1231.4 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ■

13. Sieve analysis attached? ☐ Yes ■ No

14. Drilling method used: Rotary ■ 50; Hollow Stem Auger ☐ 41; Other ☐ ___ _____

15. Drilling fluid used: Water ☐ 02; Air ■ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ■ Yes ☐ No
Describe QUIK FOAM

17. Source of water (attach analysis):
HILLSBORO CITY WELL

E. Bentonite seal, top 1155.8 ft. MSL or 80.6 ft.

F. Fine sand, top _____ ft. MSL or _____ ft.

G. Filter pack, top 1148.2 ft. MSL or 88.2 ft.

H. Screen joint, top 1135.4 ft. MSL or 101.0 ft.

I. Well bottom 1125.4 ft. MSL or 111.0 ft.

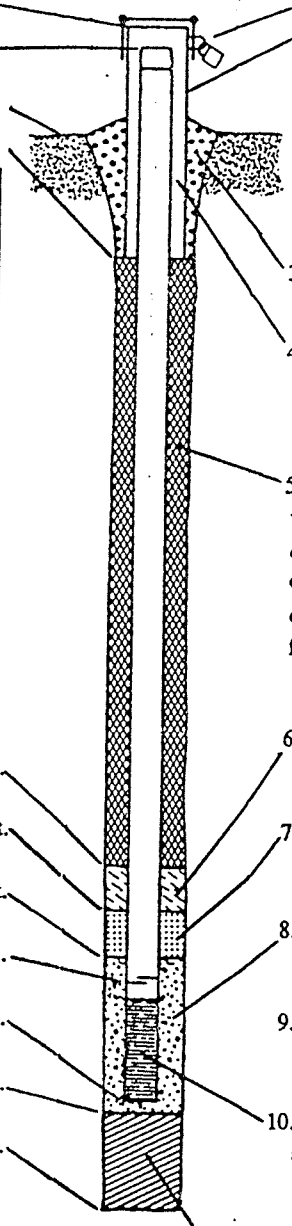
J. Filter pack, bottom _____ ft. MSL or _____ ft.

K. Borehole, bottom 1036.4 ft. MSL or 200.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 1.80 in.



1. Cap and lock? ■ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 4.0 ft.
c. Material: Steel ■ 04; Other ☐ ___ _____
d. Additional protection? ☐ Yes ■ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ■ 01; Other ☐ ___ _____

4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ ___; Other ☐ ___ _____

5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
d. 50 % Bentonite ..... Bentonite-cement grout ■ 50
e. 93.5 Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ■ 02; Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ■1/2 in. Bentonite pellets ■ 32
c. VOLCLAY PELLETS Other ☐ ___

7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft³

8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 19.98 ft³

9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ■ 24; Other ☐ ___ _____

10. Screen material: PVC Sch 80
a. Screen type: Factory cut ■ 11; Continuous slot ☐ 01; Other ☐ ___ _____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.

11. Backfill material (below filter pack): None ☐ 14; Other ☐ ___ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: William R Vack | Firm: CENTRAL WISCONSIN ENGINEERS, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for information including where the completed form should be sent.

94690000

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ■ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: Vernon Co. Balefill

Facility License, Permit or Monitoring Number: _____

Type of Well: Water Table Observation Well ■ 11; Piezometer ☐ 12

Distance Well Is From Waste/Source Boundary: ≈150 ft.

Is Well A Point of Enforcement Std. Application? ■ Yes ☐ No

Local Grid Location of Well: 320 ft. ■ N. ☐ S. 918 ft. ■ E. ☐ W.

Grid Origin Location: Lat. _____ Long. _____ or

St. Plane 582,646 ft. N. 1,776,298 ft. E.

Section Location of Waste/Source: SE 1/4 of SW 1/4 of Sec. 15, T. 13 N, R. 4 ☐ E. ■ W.

Location of Well Relative to Waste/Source: u ☐ Upgradient; s ☐ Sidegradient; d ■ Downgradient; n ☐ Not Known

Well Name: MW1PR

Wis. Unique Well Number: _____ DNR Well Number: _____

Date Well Installed: 01/21/94 (m m d d y y)

Well Installed By: (Person's Name and Firm)
Carole Eldredge
CENTRAL WIS. ENGINEERS, I

A. Protective pipe, top elevation 1247.65 ft. MSL

B. Well casing, top elevation 1247.61 ft. MSL

C. Land surface elevation 1244.9 ft. MSL

D. Surface seal, bottom 1239.9 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ■

13. Sieve analysis attached? ☐ Yes ■ No

14. Drilling method used: Rotary ■ 50; Hollow Stem Auger ☐ 41; Other ☐ _____

15. Drilling fluid used: Water ☐ 02; Air ■ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ■ Yes ☐ No
Describe Baroid Quick-Foam

17. Source of water (attach analysis):
Vernon Co Balefill

E. Bentonite seal, top 1151.9 ft. MSL or 93.0 ft.

F. Fine sand, top 1146.9 ft. MSL or 98.0 ft.

G. Filter pack, top 1140.9 ft. MSL or 104.0 ft.

H. Screen joint, top 1134.9 ft. MSL or 110.0 ft.

I. Well bottom 1119.9 ft. MSL or 125.0 ft.

J. Filter pack, bottom 1118.9 ft. MSL or 126.0 ft.

K. Borehole, bottom 1118.9 ft. MSL or 126.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 3.0 in.

N. I.D. well casing 1.94 in.

1. Cap and lock? ■ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 4.9 in.
b. Length: 7.0 ft.
c. Material: Steel ■ 04; Other ☐ _____
d. Additional protection? ☐ Yes ■ No
If yes, describe: _____

3. Surface seal: Bentonite ■ 30; Concrete ☐ 01; Other ☐ _____

4. Material between well casing and protective pipe: Bentonite ■ 30; Annular space seal ☐ _____; Other ☐ _____

5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
c. 1:1 Lbs/gal mud weight ..... Bentonite slurry ■ 31
d. _____ % Bentonite ..... Bentonite-cement grout ☐ 50
e. 14.5 Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ■ 02; Gravity ☐ 05

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32
c. 3/8" bentonite chips Other ■ _____

7. Fine sand material: Manufacturer, product name & mesh size
a. Badger Silica #45
b. Volume added 1.0 ft³

8. Filter pack material: Manufacturer, product name and mesh size
a. Badger Filter 60/40
b. Volume added 5.3 ft³

9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ■ 24; Other ☐ _____

10. Screen material: Same as #9
a. Screen type: Factory cut ■ 11; Continuous slot ☐ 01; Other ☐ _____
b. Manufacturer Northern Air & Supply
c. Slot size: 0.010 in.
d. Slotted length: 15.0 ft.

11. Backfill material (below filter pack): None ■ 14; Other ☐ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Carole Eldredge Firm: CENTRAL WIS. ENGINEERS, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

94690000

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ■ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: Vernon Co. Balefill	Local Grid Location of Well: 317 ft. ■ N ☐ S, 926 ft. ■ E ☐ W	Well Name: MW1R
Facility License, Permit or Monitoring Number:	Grid Origin Location: Lat. ____ Long. ____ or	Wis. Unique Well Number / DNR Well Number:
Type of Well: Water Table Observation Well ■ 11; Piezometer ☐ 12	St. Plane 582,646 ft. N, 4776.298 ft. E	Date Well Installed: 01/12/94 (m m d d y y)
Distance Well Is From Waste/Source Boundary: ≈ 150 ft.	Section Location of Waste/Source: SE 1/4 of SW 1/4 of Sec. 15 T. 13 N. R. 4 ☐ E. ■ W.	Well Installed By: (Person's Name and Firm): Carole Eldredge, CENTRAL WIS. ENGINEERS, I
Is Well A Point of Enforcement Std. Application? ■ Yes ☐ No	Location of Well Relative to Waste/Source: u ■ Upgradient s ☐ Sidegradient; d ☐ Downgradient n ☐ Not Known	

A. Protective pipe, top elevation 1247.29 ft. MSL
B. Well casing, top elevation 1247.25 ft. MSL
C. Land surface elevation 1244.6 ft. MSL
D. Surface seal, bottom 1239.6 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ■

13. Sieve analysis attached? ☐ Yes ■ No

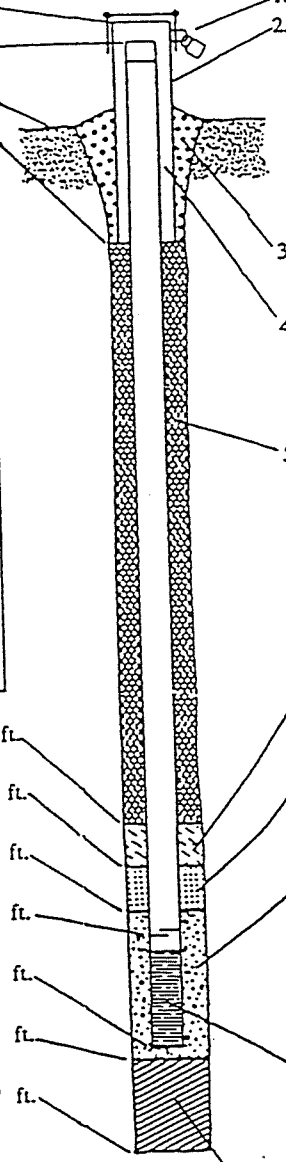
14. Drilling method used: Rotary ■ 50; Hollow Stem Auger ☐ 41; Other ☐

15. Drilling fluid used: Water ☐ 02; Air ■ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ■ Yes ☐ No
Describe Baroid Quick-Foam

17. Source of water (attach analysis):
Vernon Co. Balefill

E. Bentonite seal, top 1108.6 ft. MSL or 136.0 ft.
F. Fine sand, top 1103.6 ft. MSL or 141.0 ft.
G. Filter pack, top 1103.6 ft. MSL or 141.0 ft.
H. Screen joint, top 1097.6 ft. MSL or 147.0 ft.
I. Well bottom 1082.6 ft. MSL or 162.0 ft.
J. Filter pack, bottom 1079.6 ft. MSL or 165.0 ft.
K. Borehole, bottom 1078.6 ft. MSL or 166.0 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.94 in.



1. Cap and lock? ■ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 7.0 ft.
c. Material: Steel ■ 04; Other ☐
d. Additional protection? ☐ Yes ■ No
If yes, describe:
3. Surface seal: Bentonite ■ 30; Concrete ☐ 01; Other ☐
4. Material between well casing and protective pipe: Bentonite ■ 30; Annular space seal ☐; Other ☐
5. Annular space seal: a. Granular Bentonite ☐ 33; b. ____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35; c. ____ Lbs/gal mud weight ..... Bentonite slurry ■ 31; d. ____ % Bentonite ..... Bentonite-cement grout ☐ 50; e. 22 Ft³ volume added for any of the above; f. How installed: Tremie ☐ 01; Tremie pumped ■ 02; Gravity ☐ 05
6. Bentonite seal: a. Bentonite granules ☐ 33; b. ☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32; c. 3/8" bentonite chips Other ■
7. Fine sand material: Manufacturer, product name & mesh size
a. Badger Filter 60/40
b. Volume added 8.0 ft³
8. Filter pack material: Manufacturer, product name and mesh size
a. See #7
b. Volume added ____ ft³
9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ■ 24; Other ☐
10. Screen material: Same as #9
a. Screen type: Factory cut ■ 11; Continuous slot ☐ 01; Other ☐
b. Manufacturer Northern Air & Supply
c. Slot size: 0.010 in.
d. Slotted length: 15.0 ft.
11. Backfill material (below filter pack): None ~~X~~ 14; Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Carole Eldredge Firm: CENTRAL WIS. ENGINEERS, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route To: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 4.90

Facility/Project Name	Local Grid Location of Well	Well Name
Vernon Co. Balefill	299 Feet N, 918 Feet E	MW-1RZ
Facility License, Permit or Monitoring Number	**Grid Origin Location**	**Wis. Unique Well Number** / **DNR Well Number**
03268		JX074 / 123
Type of Well Water Table Observation Well ☐ 11 Piezometer ☒ 12	**Section Location of Waste/Source** S SE 1/4, SW 1/4, Sec.15, T13N, R4W	**Date Well Installed** 03/12/2003
Distance Well is From Waste/Source Boundary 130 ft.	**Location of Well Relative to Waste/Source** u ☒ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	**Well Installed By: (Person's Name and Firm)** Daryl Karasch Traut Hydro Tech
Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No		

A. Protective pipe, top elevation 1445.8 ft. MSL
B. Well casing, top elevation 1245.45 ft. MSL
C. Land surface elevation 1244.0 ft. MSL
D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS Classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

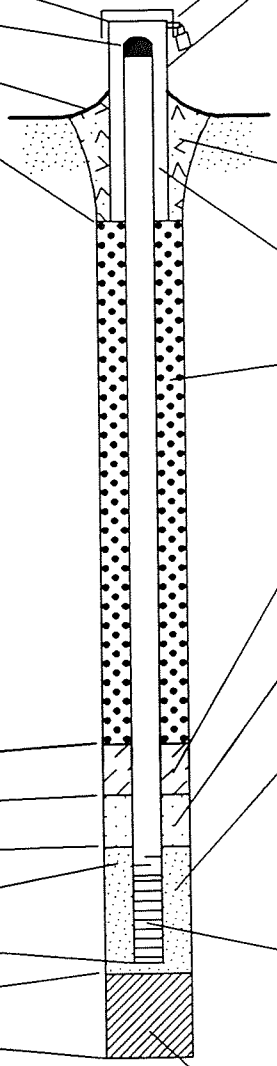
14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☐ 41
X _____ Other ☒ Versa Sonic

15. Drilling fluid used: Water ☒ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water *(attach analysis)*:
City of Viroqua Airport

E. Bentonite seal, top _____ ft. MSL or 170 ft.
F. Fine sand, top _____ ft. MSL or 175 ft.
G. Filter pack, top _____ ft. MSL or 177 ft.
H. Screen joint, top _____ ft. MSL or 180 ft.
I. Well bottom _____ ft. MSL or 185 ft.
J. Filter pack, bottom _____ ft. MSL or 185 ft.
K. Borehole, bottom _____ ft. MSL or 185 ft.
L. Borehole, diameter 7.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.94 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 7 ft.
c. Material: Steel ☒ 04
Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☒ 30
Concrete ☐ 01
_____ Other ☐
4. Material between well casing and protective pipe:
Bentonite ☒ 30
Annular space seal ☐
_____ Other ☐
5. Annular space seal: a. Granular Bentonite ☐ 33
b. ____ Lbs/gal mud weight ..... Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight ..... Bentonite slurry ☒ 31
d. ____ % Bentonite ..... Bentonite-cement grout ☐ 50
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☒ 02
Gravity ☐ 08
6. Bentonite seal: a. Bentonite Granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
c. _____ Other ☐
7. Fine sand material: Manufacturer, product name and mesh size
a. Unimin #70
b. Volume added 0.66 ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. Red Flint #40
b. Volume added 3.3 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23
Flush threaded PVC schedule 80 ☒ 24
_____ Other ☐
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
_____ Other ☐
b. Manufacturer Johnson
c. Slot size: 0.010 in.
d. Slotted length: ft.
11. Backfill material (below filter pack): None ☒ 14
_____ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Peter D Traut Jr | Firm Central Wisconisn Engineers & Architects

Please complete both sides of this form and return to the appropriate DNR office listted at the top of this form as required by chs. 144, 147 and 160 Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144 Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more an $5000 for each day of violation. In accordance with ch. 147 Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for ich day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY

Facility License, Permit or Monitoring Number: _____

Type of Well: Water Table Observation Well ☒ 11; Piezometer ☐ 12

Distance Well Is From Waste/Source Boundary: _____ ft.

Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No

Local Grid Location of Well: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Grid Origin Location: Lat. _____ Long. _____ or

St. Plane _____ ft. N, _____ ft. E.

Section Location of Waste/Source: SE 1/4 of SW 1/4 of Sec. 15, T. 13 N, R. 4 ☐ E. ☒ W.

Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known

Well Name: MW # 2

Wis. Unique Well Number: _____ DNR Well Number: _____

Date Well Installed: 01/16/89 (m m d d y y)

Well Installed By: (Person's Name and Firm): ACE WELL

A. Protective pipe, top elevation 1255.07 ft. MSL

B. Well casing, top elevation 1254.35 ft. MSL

C. Land surface elevation 1252.8 ft. MSL

D. Surface seal, bottom 1247.8 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50; Hollow Stem Auger ☐ 41; Other ☐ _____

15. Drilling fluid used: Water ☐ 02; Air ☒ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ☒ Yes ☐ No

Describe QUICK FOAM

17. Source of water (attach analysis):
HILLSBORO CITY WELL

E. Bentonite seal, top 1105.3 ft. MSL or 147.5 ft.

F. Fine sand, top _____ ft. MSL or _____ ft.

G. Filter pack, top 1097.8 ft. MSL or 155.0 ft.

H. Screen joint, top 1088.3 ft. MSL or 164.5 ft.

I. Well bottom 1078.3 ft. MSL or 174.5 ft.

J. Filter pack, bottom _____ ft. MSL or _____ ft.

K. Borehole, bottom 1062.8 ft. MSL or 190.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 1.80 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 4.0 ft.
c. Material: Steel ☒ 04; Other ☐ _____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ _____

4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ _____; Other ☐ _____

5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 50 % Bentonite . . . . . Bentonite-cement grout ☒ 50
e. 66.8 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☒ 02; Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☐ 3/8 in. ☒ 1/2 in. Bentonite pellets ☐ 32
c. VOLCLAY Other ☐ _____

7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft^3

8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 13.5 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ☒ 24; Other ☐ _____

10. Screen material: PVC Sch 80
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ _____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.

11. Backfill material (below filter pack): None ☐ 14; Other ☐ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Walter R Vach Firm: CENTRAL WISCONSIN ENGINEERS

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY	Local Grid Location of Well: _____ ft. ☐N ☐S _____ ft. ☐E ☐W	Well Name: MW-2P
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. _____ Long. _____ or	Wis. Unique Well Number / DNR Well Number: _____
Type of Well: Water Table Observation Well ☒ 11; Piezometer ☐ 12	St. Plane _____ ft. N, _____ ft. E.	Date Well Installed: 01/16/88 (m m d d y y)
Distance Well Is From Waste/Source Boundary: _____ ft.	Section Location of Waste/Source: SE1/4 of SW1/4 of Sec. 15, T. 13 N, R. 4 ☐E ☒W	Well Installed By: (Person's Name and Firm): ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient; d ☐ Downgradient n ☐ Not Known	

A. Protective pipe, top elevation 1255.07 ft. MSL
B. Well casing, top elevation 1254.88 ft. MSL
C. Land surface elevation 1252.8 ft. MSL
D. Surface seal, bottom 1247.8 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

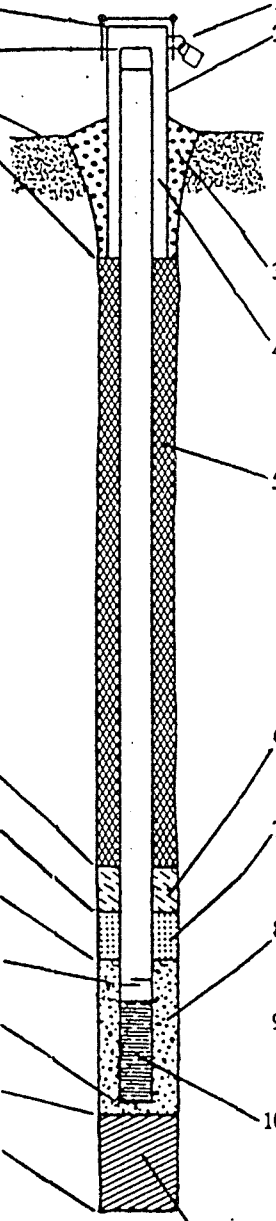
14. Drilling method used: Rotary ☒ 50; Hollow Stem Auger ☐ 41; Other ☐ ____

15. Drilling fluid used: Water ☐ 02; Air ☒ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ☒ Yes ☐ No
Describe Quik Foam

17. Source of water (attach analysis):
HILLSBORO CITY WELL

E. Bentonite seal, top 1149.2 ft. MSL or 103.6 ft.
F. Fine sand, top _____ ft. MSL or _____ ft.
G. Filter pack, top 1147.2 ft. MSL or 105.6 ft.
H. Screen joint, top 1138.0 ft. MSL or 114.8 ft.
I. Well bottom 1128.0 ft. MSL or 124.8 ft.
J. Filter pack, bottom _____ ft. MSL or _____ ft.
K. Borehole, bottom 1062.8 ft. MSL or 190.0 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.80 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 4.0 ft.
c. Material: Steel ☒ 04; Other ☐ ____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ ____
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ ____; Other ☐ ____
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 50 % Bentonite . . . . . Bentonite-cement grout ☒ 50
e. 66.8 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ☒1/2 in. Bentonite pellets ☒ 32
c. VOLCLAY Other ☐ ____
7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 27.0 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ☒ 24; Other ☐ ____
10. Screen material: PVC SCH 80
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☐ 14; Other ☐ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: William R Vach | Firm: CENTRAL WISCONSIN ENGINEERS, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

ite of Wisconsin
partment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Vernon County

Grid Location: 1231.0 ft. ☒ N. ☐ S. / 1094.7 ft. ☒ E. ☐ W.

Well Name: MW-7

Wis. Unique Well Number / DNR Well Number

Facility License, Permit or Monitoring Number: 03268

Type of Well: Water Table Observation Well ☐ 11 / Piezometer ☒ 12

Section Location: SE 1/4 of SE 1/4 of Section 15, T 13 N, R 4 ☐ E ☒ W

Date Well Installed: 11/07/89 (m m d d y y)

Distance Well Is From Waste/Source Boundary: 90' from prop. waste units ft.

Well Installed By: (Person's Name and Firm)
Gus Pech
Exploration Technology, Inc.

Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No

Location of Well Relative to Waste/Source: ☐ Upgradient ☒ Sidegradient ☐ Downgradient ☐ Not Known

A. Protective pipe, top elevation 1257.75 ft. MSL
B. Well casing, top elevation 1257.98 ft. MSL
C. Land surface elevation 1255.7 ft. MSL
D. Surface seal, bottom 1035.5 ft. MSL or 222.5 ft.

1. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP
☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☒ Bedrock

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50 / Hollow Stem Auger ☐ 41 / Other ☐

15. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☒ 03 / None ☐ 99

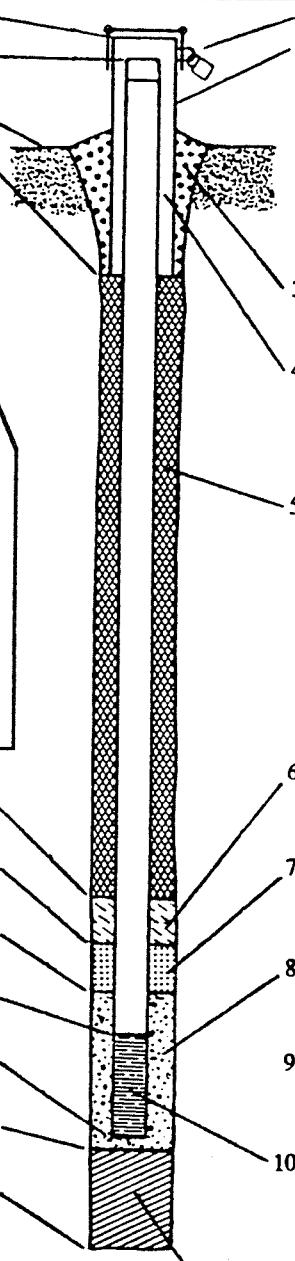
16. Drilling additives used? ☒ Yes ☐ No

Describe: Foam

17. Source of water (attach analysis):
City of Viroqua Municipal Water

Bentonite seal, top 1035.5 ft. MSL or 222.5 ft.
Fine sand, top 1033.5 ft. MSL or 224.5 ft.
Filter pack, top 1031.5 ft. MSL or 226.5 ft.
Well screen, top 1028.5 ft. MSL or 229.5 ft.
Well screen, bottom 1023.5 ft. MSL or 234.5 ft.
Filter pack, bottom 1023.5 ft. MSL or 234.5 ft.
Borehole, bottom 1023.5 ft. MSL or 234.5 ft.

Borehole, diameter 6.0 in.
O.D. well casing 2.40 in.
I.D. well casing 2.00 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒ 04 / Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe:
3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐
4. Material between well casing and protective pipe: Bentonite ☒ 30 / Annular space seal ☐ / Other ☐
5. Annular space seal: Granular Bentonite ☒ 33 / _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 / _____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31 / _____ % Bentonite .... Bentonite-cement grout ☐ 50
37.0 Ft³ volume added for any of the above
How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☒ 08
6. Bentonite seal: Bentonite granules ☐ 33 / ☐1/4 in. ☐3/8 in. ☐1/2 in. Bentonite pellets ☐ 32 / No. 8 Bentonite Hole Plug Other ☒
7. Fine sand material: Manufacturer, product name and mesh size
Ottowa Sand
Volume added 0.4 ft³
8. Filter pack material: Manufacturer, product name and mesh size
Waupaca Materials No. 30 Flint
Volume added 1.4 ft³
9. Well casing: Flush threaded PVC schedule 40 ☐ 23 / Flush threaded PVC schedule 80 ☒ 24 / Other ☐
10. Screen material: Sch. 80 PVC
Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐
Manufacturer: Northern Air & Supply
Slot size: 0.010 in.
Slotted length: 4.5 ft.
11. Backfill material (below filter pack): N/A None ☐ / Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Firm: Central Wisconsin Engineers

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with s. 144.4, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with s. 160.147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation.
NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
partment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Vernon Co.

Facility License, Permit or Monitoring Number: 03268

Type of Well: Water Table Observation Well ☐ 11; Piezometer ☐ 12

Distance Well Is From Waste/Source Boundary: 100' From Prop. Waste Limits ft.

Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No

Grid Location: 1236.3 ft. ☒ N. ☐ S.; 1081.6 ft. ☒ E. ☐ W.

Section Location: SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 ☐ E ☒ W

Location of Well Relative to Waste/Source: ☐ Upgradient ☒ Sidegradient ☐ Downgradient ☐ Not Known

Well Name: MW-8R

Wis. Unique Well Number: ____ DNR Well Number: ____

Date Well Installed: 11 / 13 / 89 (m m / d d / y y)

Well Installed By: (Person's Name and Firm)
Gus Pech
Exploration Technology, Inc.

A. Protective pipe, top elevation 1258.59 ft. MSL

B. Well casing, top elevation 1258.83 ft. MSL

C. Land surface elevation 1256.1 ft. MSL

D. Surface seal, bottom 1079.3 ft. MSL or 179.5 ft.

11. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP
☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☒ Bedrock

12. Sieve analysis attached? ☐ Yes ☒ No

13. Drilling method used: Rotary ☒ 50; Hollow Stem Auger ☐ 41; Other ☐ ____

15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☒ 03; None ☐ 99

16. Drilling additives used? ☒ Yes ☐ No

Describe: Foam

17. Source of water (attach analysis):
City of Viroqua Municipal Water

E. Bentonite seal, top 1079.3 ft. MSL or 179.5 ft.

F. Fine sand, top 1076.3 ft. MSL or 182.5 ft.

G. Filter pack, top 1074.3 ft. MSL or 184.5 ft.

H. Well screen, top 1071.3 ft. MSL or 187.5 ft.

I. Well screen, bottom 1056.3 ft. MSL or 202.5 ft.

J. Filter pack, bottom 1056.3 ft. MSL or 202.5 ft.

K. Borehole, bottom 1049.3 ft. MSL or 209.5 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 2.00 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒ 04; Other ☐ ____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: ____

3. Surface seal: Bentonite ☒ 30; Concrete ☐ 01; Other ☐ ____

4. Material between well casing and protective pipe:
Bentonite ☒ 30; Annular space seal ☐; Other ☐ ____

5. Annular space seal: Granular Bentonite ☒ 33
____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
30.0 Ft³ volume added for any of the above
How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08

6. Bentonite seal: Bentonite granules ☐ 33
☒ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
Other ☐ ____

7. Fine sand material: Manufacturer, product name and mesh size
Ottowa Sand
Volume added 0.4 ft³

8. Filter pack material: Manufacturer, product name and mesh size
Waupaca Materials No. 30 Flint
Volume added 3.0 ft³

9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ☒ 24; Other ☐ ____

10. Screen material: Sch. 80 PVC
Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ____
Manufacturer: Northern Air & Supply
Slot size: 0.010 in.
Slotted length: 13.5 ft.

11. Backfill material (below filter pack): None ☐
No. 30 Flint Sand Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: [signature] Firm: Central Wisconsin Engineers

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with s. 144.4, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with s. 147.021, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation.

NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Vernon Co.

Facility License, Permit or Monitoring Number: 03268

Grid Location: 1239.9 ft. [X] N. [ ] S.; 1099.3 ft. [X] E. [ ] W.

Well Name: MW-9

Wis. Unique Well Number: ____ DNR Well Number: ____

Type of Well: Water Table Observation Well [X] 11; Piezometer [ ] 12

Section Location: SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 [ ] E [X] W

Date Well Installed: 08/29/89 (m m / d d / y y)

Distance Well Is From Waste/Source Boundary: 95' From Prop. Waste Limits ft.

Well A Point of Enforcement Std. Application? [X] Yes [ ] No

Location of Well Relative to Waste/Source: [ ] Upgradient [X] Sidegradient [ ] Downgradient [ ] Not Known

Well Installed By: (Person's Name and Firm)
Gus Pech
Exploration Technology, Inc.

A. Protective pipe, top elevation 1257.22 ft. MSL

B. Well casing, top elevation 1257.50 ft. MSL

C. Land surface elevation 1255.4 ft. MSL

D. Surface seal, bottom 1161.5 ft. MSL or 960. ft.

11. USCS classification of soil near screen:
[ ] GP [ ] GM [ ] GC [ ] GW [ ] SW [ ] SP
[ ] SM [ ] SC [ ] ML [ ] MH [ ] CL [ ] CH
[X] Bedrock

12. Sieve analysis attached? [ ] Yes [X] No

13. Drilling method used: Rotary [X] 50; Hollow Stem Auger [ ] 41; Other [ ]

14. Drilling fluid used: Water [ ] 02; Air [ ] 01; Drilling Mud [X] 03; None [ ] 99

15. Drilling additives used? [ ] Yes [X] No

Describe ____

16. Source of water (attach analysis):
City of Viroqua Municipal Water

E. Bentonite seal, top 1161.5 ft. MSL or 96.0 ft.

F. Fine sand, top 1158.7 ft. MSL or 98.8 ft.

G. Filter pack, top 1155.7 ft. MSL or 101.8 ft.

H. Well screen, top 1145.7 ft. MSL or 111.8 ft.

I. Well screen, bottom 1130.7 ft. MSL or 126.8 ft.

J. Filter pack, bottom 1130.7 ft. MSL or 126.8 ft.

K. Borehole, bottom 1124.0 ft. MSL or 133.5 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 2.00 in.

1. Cap and lock? [X] Yes [ ] No

2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel [X] 04; Other [ ]
d. Additional protection? [ ] Yes [X] No
If yes, describe: ____

3. Surface seal: Bentonite [X] 30; Concrete [ ] 01; Other [ ]

4. Material between well casing and protective pipe: Bentonite [X] 30; Annular space seal [ ]; Other [ ]

5. Annular space seal: Granular Bentonite [X] 33
____ Lbs/gal mud weight ... Bentonite-sand slurry [ ] 35
____ Lbs/gal mud weight ..... Bentonite slurry [ ] 31
____ % Bentonite .... Bentonite-cement grout [ ] 50
16.0 Ft^3 volume added for any of the above
How installed: Tremie [ ] 01; Tremie pumped [ ] 02; Gravity [X] 08

6. Bentonite seal: Bentonite granules [ ] 33
[ ] 1/4 in. [ ] 3/8 in. [ ] 1/2 in. Bentonite pellets [ ] 32
No. 8 Bentonite Hole Plug Other [X]

7. Fine sand material: Manufacturer, product name and mesh size
Ottowa Sand
Volume added 0.5 ft^3

8. Filter pack material: Manufacturer, product name and mesh size
Waupaca Materials No. 30 Flint
Volume added 4.2 ft^3

9. Well casing: Flush threaded PVC schedule 40 [ ] 23; Flush threaded PVC schedule 80 [X] 24; Other [ ]

10. Screen material: Sch. 80 PVC
Screen type: Factory cut [X] 11; Continuous slot [ ] 01; Other [ ]
Manufacturer Northern Air & Supply
Slot size: 0.010 in.
Slotted length: 13.5 ft.

11. Backfill material (below filter pack): None [ ]
Natural Soils Other [ ]

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Kirk Thornton Firm: Central Wisconsin Engineers

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation.

NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
epartment of Natural Resources

Route To: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4.90

Facility/Project Name *Vernon Co. Balefill*	**Local Grid Location of Well** *295.72 Feet N, 1259.36 Feet E*	**Well Name** *MW-13P*
Facility License, Permit or Monitoring Number *03268*	**Grid Origin Location**	**Wis. Unique Well Number** / **DNR Well Number** *JX071* / *117*
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	**Section Location of Waste/Source** *SW 1/4, SE 1/4, Sec.15, T13N, R4W*	**Date Well Installed** *02/26/2003*
Distance Well is From Waste/Source Boundary *110 ft.*	**Location of Well Relative to Waste/Source** u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	**Well Installed By: (Person's Name and Firm)** *Daryl Karasch* *Traut Hydro Tech*
Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No		

A. Protective pipe, top elevation 1227.7 ft. MSL
B. Well casing, top elevation 1227.42 ft. MSL
C. Land surface elevation 1224.5 ft. MSL
D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS Classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

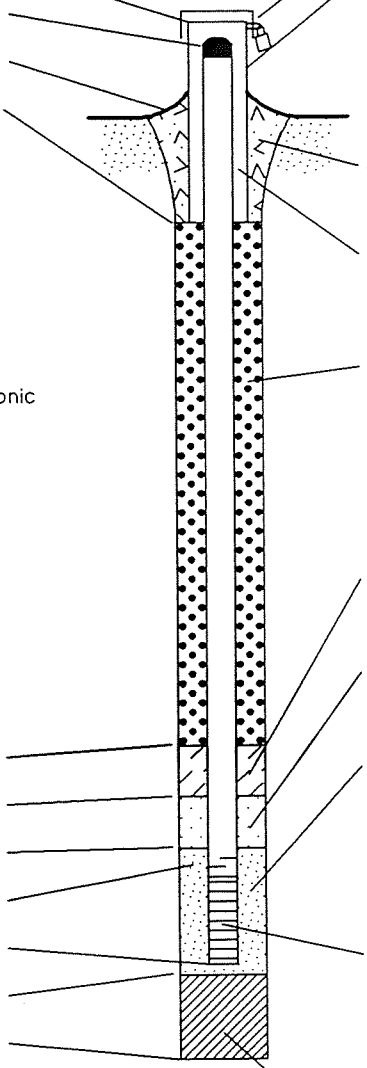
14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☐ 41
x _____ Other ☒ Versa Sonic

15. Drilling fluid used: Water ☒ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water *(attach analysis)*:
City of Viroqua Airport

E. Bentonite seal, top _____ ft. MSL or 76 ft.
F. Fine sand, top _____ ft. MSL or 81 ft.
G. Filter pack, top _____ ft. MSL or 83 ft.
H. Screen joint, top _____ ft. MSL or 85 ft.
I. Well bottom _____ ft. MSL or 100 ft.
J. Filter pack, bottom _____ ft. MSL or 100 ft.
K. Borehole, bottom _____ ft. MSL or 100 ft.
L. Borehole, diameter 7.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.94 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 7 ft.
c. Material: _____ Steel ☐ 04
Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☒ 30
Concrete ☐ 01
_____ Other ☐
4. Material between well casing and protective pipe:
Bentonite ☒ 30
Annular space seal ☐
_____ Other ☐
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight ..... Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
d. _____ % Bentonite ..... Bentonite-cement grout ☒ 50
e. _____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☒ 02
Gravity ☐ 08
6. Bentonite seal: a. Bentonite Granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
c. _____ Other ☐
7. Fine sand material: Manufacturer, product name and mesh size
a. Unimin #70
b. Volume added 0.66 ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. Red Flint #40
b. Volume added 4.6 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23
Flush threaded PVC schedule 80 ☒ 24
_____ Other ☐
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
_____ Other ☐
b. Manufacturer Johnson
c. Slot size: 0.010 in.
d. Slotted length: 15.0 ft.
11. Backfill material (below filter pack): None ☒ 14
_____ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm Central Wisconisn Engineers & Architects

Please complete both sides of this form and return to the appropriate DNR office listted at the top of this form as required by chs. 144, 147 and 160 Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144 Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147 Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

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I-2 – Response to AGIP Acceptance Letter

Building a Better World
for All of Us®

July 27, 2022

RE: Vernon County Landfill
Response to AGIP Acceptance Letter
SEH No. VERSW 167824 14.00

Carolyn Cooper, Hydrogeologist
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711-5367

Dear Ms. Cooper:

On behalf of the Vernon County Landfill, Short Elliott Hendrickson Inc. (SEH®) submitted an Alternative Geotechnical Program Request (AGIP) to the Wisconsin Department of Natural Resources (WDNR) on December 12, 2021. The WDNR accepted the AGIP in a letter submitted to Vernon County Landfill on March 30, 2022. The WDNR and SEH also had a virtual meeting on June 9, 2022, to discuss several of the WDNR comments. This letter provides a response to a few outstanding items that were stated by the WDNR within the AGIP acceptance letter and discussed at the June 2022 meeting. The following discussion re-states the pertinent portions of the WDNR comments followed by the respective response.

WDNR Comment 1 – Bedrock Coring and Geophysics: *In lieu of bedrock core sampling, downhole geophysical logging should be used to evaluate bedrock fractures including their size, frequency, distribution, connectivity, and hydraulic conductivity.*

Response: This item was discussed with the WDNR at the June 9 meeting. Bedrock coring is now being proposed at one location, MW-14WT, at the location shown on **Figure 1**. Based on previous coring efforts and its location on the ridge, this location was selected because it is anticipated to have the most competent bedrock to make coring successful; weathering of bedrock is generally deeper within valleys.

Based on the June 9 discussion, we are also proposing to conduct borehole geophysics at each of the four new well locations (only the deepest well will be logged at the MW-16WT/MW-16 location). Due to the depth to groundwater, borehole geophysical methods will be limited to natural gamma. The natural gamma radiation may allow identification of vertical lithologic variations, particularly in reference to shales, that could potentially cause groundwater perching or diversion during percolation. In addition, natural gamma radiation may be useful for establishing marker horizons across the site to better correlate between boreholes.

In reference to borehole geophysics, we also are proposing to log natural gamma radiation at eight existing well locations (**Figure 1**). Each of the wells proposed for geophysics is the deepest well within the respective well nest. Natural gamma radiation measurements can be collected through the existing steel casing. As indicated above, natural gamma radiation may allow identification of vertical lithologic variations and establish marker horizons across the site to correlate between past and new boreholes. The following table is a summary of the existing wells and proposed borings for borehole geophysics.

Existing Well ID	Depth (feet)	Proposed Well ID	Proposed Depth (feet)
MW-1	200	MW-14WT	97
MW-1RZ	185	MW-15WT	90
MW-2	190	MW-16	85
MW-6	210	MW-17WT	78
MW-5	190		
MW-7	234.5		
MW-10	181		
MW-14Z	210		

WDNR Comment 2 – Well Development: *Note, that additional well volumes may need to be removed if the turbidity and field parameters indicate additional purging is warranted.*

Response: Concur; additional well volumes will be removed until the turbidity/water clarity indicates proper well development. In accordance with Wis. Adm. Code NR 507.07, a sample will be taken from each well within 24 hours of completion of well development and analyzed for total suspended solids. Because drilling fluid will be used, COD will also be analyzed.

WDNR Comment 3 – Borings within Cross-Sections: *However, it (AGIP, Section 2.2) does not discuss which borings can be used to characterize the subsurface of the vertical overlay component. The previously installed borings used to characterize the subsurface of the area within 300 feet of the vertical overlay for past feasibility reports should also be used to draw the cross-sections.*

Response: Concur; all previously installed borings that characterize the subsurface within 300 feet of the expansion will be used in the development of geologic cross-sections.

WDNR Comment 4 – Location of Monitoring Well: *The department requests that Vernon County consider installing a water table well northeast of the expansion area, east of the word "wooded" on Figure 7 of the AGIP. This well could help better define the groundwater divide to the north of the proposed expansion area and would be a northern point beyond the limits of waste on an east-west cross-section.*

Response: This item was discussed with the DNR at the June 9 meeting. The proposed location of well MW-14WT has been moved to the east in order to monitor the area northeast of the proposed expansion. The new proposed MW-14WT location is provided on **Figure 1**. Due to proposed well MW-14WT moving locations, the summary table for the drilling program has been revised to indicate a new proposed boring depth table and included in **Table 1**.

WDNR Comment 5 – Soil Data: *The department will allow the use of previously collected soil laboratory testing data toward meeting the requirements of s. NR 512.09(4), Wis. Adm. Code. This data, along with newly acquired data, must be submitted with the feasibility report.*

Response: Concur; the previously collected and newly acquired data will be submitted with the feasibility report in accordance with Wis. Adm. Code NR 512.09(04).

WDNR Comment 6 – Hydraulic Conductivity Data: *The department will allow the use of previously collected hydraulic conductivity data toward meeting the requirements of s. NR 512.09(4), Wis. Adm. Code. This data, along with any newly acquired data, must be submitted with the feasibility report.*

Response: Concur; the previously collected and newly acquired data will be submitted with the feasibility report in accordance with Wis. Adm. Code NR 512.09(04).

WDNR Comment 7 – Retention of Core Samples: *Core samples obtained from newly drilled borings should be retained through the feasibility determination in accordance with the requirements of s. NR 507.05(1)(e), Wis. Adm. Code.*

Response: Concur; the core samples obtained at proposed MW-14WT will be retained through the feasibility determination in accordance with Wis. Adm. Code NR 507.05(1)(e).

WDNR Comment 8 – Geologic Cross-Sections: *All of the borings, wells and piezometers that are used to define the subsurface for the area of the vertical and horizontal expansion should be used to draw the cross-sections. This would include those borings, wells, and piezometers within 300 feet of the limits of the vertical and horizontal expansion. The department does not agree with this request.*

Response: All test pits, borings, wells, and piezometers within 300-feet of the proposed expansion limits will be included to create the geological cross-sections submitted within the feasibility. However, several data situations exist outside of the 300-foot limits that need clarification on how or if they can or should be utilized in geologic cross-section development. For reference, all borings within the site are provided on **Table 2** with locations illustrated on **Figure 1**. Special consideration needs to be given for the following boring log and test pit scenarios (several borings or test pits may fall into multiple categories):

- No Boring Log Available: As indicated in **Table 2**, logs are not available for the following borings completed in 1987: AB-5, AB-9, AB-10, AB-15, AB-18, AB-19, AB-21, AB-22 AB-23, AB-24, AB-25, AB-28, AB-29, and AB-30. Limited information on depth to bedrock or bedrock elevation may have been included in tables or figures from previous reports. Data from these old logs will be utilized in cross-section development if the information can be substantiated and/or appears representative of anticipated conditions.
- Shallow Borings/Test Pits: Many borings or test pits were completed as part of the original landfill siting (prior to landfill development) or as part of soil borrow investigations. As indicated in **Table 2**, nearly 20 of these are less than 10 feet deep. Due to site development, soils in these areas may have been completely removed. Data from these old logs will be utilized in cross-section development if the information is pertinent to geologic interpretation.
- Distant Borings/Test Pits: Many borings or test pits were completed as part of the original landfill siting (prior to landfill development) or as part of soil borrow investigations. As a result, several of these borings and test pits are generally situated greater than 500 feet from the existing landfill footprint and are not included on **Figure 1** due to their location. As a result, geologic cross-sections are not anticipated to intersect the following distant borings and test pits: AB-1, AB-2, AB-3, AB-4, AB-5, AB-7, AB-8, AB-9, AB-10, AB-11, TP-1, TP-2, T-3, TP-4, TP-9, and TP-26.
- Nested Boring/Well Locations: Several locations across the site have nested monitoring wells and corresponding boring logs. Since the original borings were completed within a few feet of each other, they often simply reference a corresponding deeper log. Due to the proximity of the borings, providing the lithology or soil classification for each log would cause overlap when illustrated to scale on the cross-sections, making the information difficult to read. Therefore, it is proposed that the deepest and/or most accurate boring log be used from each well nest/grouping; this also applies to test pits completed in the vicinity of deeper borings and/or well installations. Any unique or pertinent information from other boring logs within the well nest/grouping will be provided within the cross-section via footnote, as appropriate. The following are the well nests/groupings present within 300-feet of the proposed expansion and existing landfill where multiple logs are available, and the best existing and most complete information is proposed to be illustrated on the geologic cross-sections:
    - MW-1/MW-1P
    - MW-1R/MW-1PR/MW-1RZ

- MW-2/MW-2P
- MW-3/MW-4/MW-4P/MW-6
- MW-5/MW-5A
- MW-7/MW-8R/MW-9, B-13
- MW-10/MW-11/MW-12
- MW-14/MW-14Z
- B-3, AB-18
- B-5, AB-21
- B-6, TB-2, TP-A
- B-8, TB-10
- B-11, AB-22
- TB-11, AB-19
- TP-23, TB-3

Note: All well construction details will still be displayed within the cross-section in accordance with Wis. Adm. Code NR 512.11(02)(d) but only one boring will list the USCS classification codes/bedrock lithology.

WDNR Comment 9 – Boring Logs: *All available boring logs within 300 feet of the proposed limits of the vertical and horizontal expansion that were used for previous feasibility reports should be provided.*

Response: Concur; all available boring logs within 300 feet of the proposed expansion will be provided within the feasibility report.

Currently, the AGIP drilling program is scheduled to begin in late August 2022. If you have any additional questions or comments, please feel free to contact Melanie Niday (320.229.4346 or mniday@sehinc.com) or Brian Kent (715.456.4621 or bkent@sehinc.com).

Sincerely,

SHORT ELLIOTT HENDRICKSON INC.

Melanie G. Niday, PG
Project Hydrogeologist



July 26, 2022

MAL/MGN/BLK
Attachments: Figure 1, Table 1, and Table 2

c: Bridget Kelly, Wisconsin Department of Natural Resources
Colin Maus, Wisconsin Department of Natural Resources
Joe Lourigan, Wisconsin Department of Natural Resources
Valerie Joosten, Wisconsin Department of Natural Resources
Stacie Sanborn, Vernon County Landfill
Darryl Heaps, Short Elliott Hendrickson Inc.
Brian Kent, Short Elliott Hendrickson Inc.

PLOTTED: 7/25/2022 3:53:10 PM
MODIFIED: 7/25/2022 2:10:53 PM
USER: TROMANKO

GENERAL NOTES:

1. EXISTING GRADE CONTOURS SHOWN IN 10-FOOT INTERVALS FOR CLARITY. CONTOURS UPDATED WITH MOST RECENT SURVEY WITHIN WASTE LIMITS PERFORMED BY SHORT ELLIOTT HENDRICKSON INC. ON MARCH 9, 2021.

LEGEND:

- EXISTING WASTE LIMITS
- PROPOSED WASTE LIMITS
- 150' DESIGN MANAGEMENT ZONE
- 300' WELL SETBACK BOUNDARY
- 820 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- B-21 PROPOSED SOIL BORING
- MW-17WT / MW-1P PROPOSED MONITORING WELL
- MW-1P EXISTING MONITORING WELL
- MW-17WT / MW-1P PROPOSED GEOPHYSICS LOCATION

0 80 160
SCALE IN FEET

NO	DATE	BY	REMARKS
	07/25/2022	DRH	ISSUED FOR REGULATORY REVIEW

REVISIONS

NO	DATE	BY	REMARKS

REVISIONS

DESIGNED TTR	CHECKED BLK
DRAWN TTR	CHECKED MGN
DATE 07/25/2022	APPROVED DRH

PLANS PREPARED BY:
SEH
329 JAY STREET
SUITE 301
LA CROSSE, WI 54601-4034
PHONE: 1.608.782.3161
www.sehinc.com

PLANS PREPARED FOR:
VERNON COUNTY SOLID WASTE DEPT
53705 CTH LF
VIROQUA, WISCONSIN

PROJECT/CONTRACT NO: VERNON COUNTY
SEH PROJECT NO: VERSW 167824
FILE NAME: VC167824FIG1

VERNON COUNTY LANDFILL
RESPONSE TO AGIP ACCEPTANCE LETTER
VIROQUA, WISCONSIN

PROPOSED SOIL BORINGS, WELLS, AND PIEZOMETER LOCATIONS

FIG 1
1 OF 1

X:\UZ\V\VERSW\167824\5-FINAL-DSGN\51-DRAWINGS\85-HEAVY\CIVIL\RESPONSE TO AGIP ACCEPTANCE LETTER\SHEETS\VC167824FIG1.DWG

Table 1
Proposed Soil Borings for Landfill Expansion
Vernon County Landfill

Proposed Soil Boring	Approximate Coordinates		Existing Grade Elevation (feet NGVD)	Estimated Information			Proposed Information			
	Northing	Easting		Weathered Bedrock Elevation (feet NGVD)	Competent Bedrock Elevation (feet NGVD)	Water Table Elevation (feet NGVD)	Subbase Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Basis for Proposed Soil Boring Depth
MW-14WT	1341.6	1907.0	1247.0	1220	1160	1160	outside	97	1150	10 feet below the water table elevation
MW-15WT	990.3	1939.7	1219.3	1210	1181	1139	outside	90	1129	10 feet below the water table elevation
MW-16	546.6	1887.2	1179.2	1179	1172	1134	outside	85	1094	30 feet below the water table elevation
MW-17WT	306.0	1907.4	1199.9	1180	1162	1132	outside	78	1122	10 feet below the water table elevation
B-18	1128.2	1690.6	1239.0	1211	1174	1145	1239	25	1214	25 feet below subbase elevation
B-19	994.5	1690.3	1233.1	1205	1185	1140	1234	24	1209	25 feet below subbase elevation
B-20	679.5	1733.8	1215.1	1196	1180	1136	1219	21	1194	25 feet below subbase elevation
B-21	468.4	1621.3	1226.5	1191	1171	1134	1221	30	1196	25 feet below subbase elevation

Notes:
- Actual boring locations and depths may change due to field conditions.

Table 2
Page 1 of 3
Existing Soil Borings for Landfill Property
Vernon County Landfill

Soil Boring Nomenclature	Year Installed	Drilling Company	Ground Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Depth to Weathered Bedrock (feet bgs)	Weathered Bedrock Elevation (feet NGVD)	Depth to Competent Bedrock (feet bgs)	Competent Bedrock Elevation (feet NGVD)	Boring Log Available (Y/N) [1]
Borings within 300-feet of the Proposed Expansion										
MW-3	1987	Ace Well Drilling	1233.0	180.0	1053.0	20.0	1213.0	80.0	1153.0	Y
MW-4/-4P	1987	Ace Well Drilling	1232.9	160.0	1072.9	20.0	1212.9	80.0	1152.9	Y
MW-6	1988	Ace Well Drilling	1233.0	210.0	1023.0	14.0	1219.0	80.0	1153.0	Y
TB-4	1988	Wisconsin Test Drilling	1232.9	15.0	1217.9	12.0	1220.9	NE	NE	Y
TB-5	1988	Wisconsin Test Drilling	1221.0	25.0	1196.0	22.0	1199.0	NE	NE	Y
TB-6	1988	Wisconsin Test Drilling	1218.7	16.5	1202.2	13.5	1205.2	NE	NE	Y
TB-7	1988	Wisconsin Test Drilling	1245.4	47.5	1197.9	38.0	1207.4	NE	NE	Y
TB-8	1988	Wisconsin Test Drilling	1249.4	45.5	1203.9	42.0	1207.4	NE	NE	Y
MW-5A	1989	Exploration Technology	1224.0	103.0	1121.0	17.5	1206.5	NA	NA	Y*
MW-5	1988	Ace Well Drilling	1223.3	180.0	1043.3	20.0	1203.3	35.0	1188.3	Y
MW-10	1989	Exploration Technology	1215.6	181.0	1034.6	24.5	1191.1	61.0	1154.6	Y
MW-11	1989	Exploration Technology	1216.4	163.0	1053.4	24.5	1191.9	61.0	1155.4	Y
MW-12	1989	Exploration Technology	1216.4	103.0	1113.4	24.5	1191.9	61.0	1155.4	Y
TB-15	1989	Exploration Technology	1193.5	12.0	1181.5	11.5	1182.0	NE	NE	Y
MW-14	2003	Traut Hydro Tech	1247.5	190.0	1057.5	71.0	1176.5	100.0	1147.5	Y
MW-14Z	2003	Traut Hydro Tech	1247.5	210.0	1037.5	71.0	1176.5	100.0	1147.5	Y
B-15	2021	Mathy Construction Co	1252.9	45.0	1207.9	40.0	1212.9	45.0	1207.9	Y
B-16	2021	Mathy Construction Co	1245.9	36.0	1209.9	32.0	1213.9	36.0	1209.9	Y
B-17	2021	Mathy Construction Co	1238.8	39.0	1199.8	28.0	1210.8	39.0	1199.8	Y
Borings outside 300-feet of the Proposed Expansion										
MW-1/-1P	1987	Ace Well Drilling	1236.4	200.0	1036.4	28.0	1208.4	80.0	1156.4	Y
MW-2/-2P	1987	Ace Well Drilling	1252.5	190.0	1062.5	30.0	1222.5	40.0	1212.5	Y
AB-1	1987	James Construction Co.	1255.5	19.0	1236.5	19.0	1236.5	NE	NE	Y
AB-2	1987	James Construction Co.	1256.7	8.0	1248.7	6.0	1250.7	8.0	1248.7	Y
AB-3	1987	James Construction Co.	1257.3	6.0	1251.3	6.0	1251.3	NE	NE	Y
AB-4	1987	James Construction Co.	1257.2	6.5	1250.7	6.5	1250.7	NE	NE	Y
AB-5	1987	NA	NA	NA	NA	NA	1243.0	NA	NA	N
AB-7	1987	James Construction Co.	1261.1	20.0	1241.1	20.0	1241.1	NE	NE	Y
AB-8	1987	James Construction Co.	1260.0	8.0	1252.0	8.0	1252.0	NE	NE	Y
AB-9	1987	NA	NA	NA	NA	NA	1238.0	NA	NA	N
AB-10	1987	NA	NA	NA	NA	NA	1228.0	NA	NA	N
AB-11	1987	James Construction Co.	1258.9	21.0	1237.9	21.0	1237.9	NE	NE	Y
AB-15	1987	NA	NA	NA	NA	NA	1224.0	NA	NA	N
AB-18	1987	NA	NA	NA	NA	NA	1237.0	NA	NA	N
AB-19	1987	NA	NA	NA	NA	NA	1241.0	NA	NA	N
AB-21	1987	NA	NA	NA	NA	NA	1248.0	NA	NA	N
AB-22	1987	NA	NA	NA	NA	NA	1240.0	NA	NA	N
AB-23	1987	NA	NA	NA	NA	NA	1235.0	NA	NA	N
AB-24	1987	NA	NA	NA	NA	NA	1223.0	NA	NA	N
AB-25	1987	NA	NA	NA	NA	NA	1218.0	NA	NA	N
AB-28	1987	NA	NA	NA	NA	NA	1221.0	NA	NA	N

Table 2
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Existing Soil Borings for Landfill Property
Vernon County Landfill

Soil Boring Nomenclature	Year Installed	Drilling Company	Ground Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Depth to Weathered Bedrock (feet bgs)	Weathered Bedrock Elevation (feet NGVD)	Depth to Competent Bedrock (feet bgs)	Competent Bedrock Elevation (feet NGVD)	Boring Log Available (Y/N) [1]
Borings outside 300-feet of the Proposed Expansion										
AB-29	1987	NA	NA	NA	NA	NA	1209.0	NA	NA	N
AB-30	1987	NA	NA	NA	NA	NA	1207.0	NA	NA	N
TB-1	1988	Wisconsin Test Drilling	1234.9	17.0	1217.9	NE	NE	NE	NE	Y
TB-2	1988	Wisconsin Test Drilling	1252.7	19.5	1233.2	17.0	1235.7	NE	NE	Y
TB-3	1988	Wisconsin Test Drilling	1253.4	14.5	1238.9	14.0	1239.4	NE	NE	Y
TB-9	1988	Wisconsin Test Drilling	1236.2	22.0	1214.2	NE	NE	NE	NE	Y
TB-10	1989	Exploration Technology	1258.8	18.0	1240.8	16.0	1242.8	NE	NE	Y
TB-11	1989	Exploration Technology	1253.9	26.0	1227.9	15.0	1238.9	NE	NE	Y
TB-12	1989	Exploration Technology	1259.1	15.0	1244.1	12.0	1247.1	NE	NE	Y
TP-1	1989	NA	1245.5	5.0	1240.5	3.5	1242.0	NE	NE	Y
TP-2	1989	NA	1251.4	6.5	1244.9	6.5	1244.9	NE	NE	Y
TP-3	1989	NA	1254.6	9.5	1245.1	9.5	1245.1	NE	NE	Y
TP-4	1989	NA	1258.3	8.5	1249.8	7.5	1250.8	NE	NE	Y
TP-7	1989	NA	1258.9	10.0	1248.9	NE	NE	NE	NE	Y
TP-8	1989	NA	1251.9	8.5	1243.4	NE	NE	NE	NE	Y
TP-9	1989	NA	1239.4	8.0	1231.4	7.0	1232.4	NE	NE	Y
TP-10	1989	NA	1234.8	11.0	1223.8	NE	NE	NE	NE	Y
TP-11	1989	NA	1244.9	7.0	1237.9	7.0	1237.9	NE	NE	Y
TP-15	1989	NA	1250.7	NA	NA	NE	NE	NE	NE	Y
TP-16	1989	NA	1236.0	5.5	1230.5	NE	NE	NE	NE	Y
TP-18	1989	NA	1234.9	8.0	1226.9	NE	NE	NE	NE	Y
TP-19	1989	NA	1250.9	5.5	1245.4	NE	NE	NE	NE	Y
TP-20	1989	NA	1251.3	12.5	1238.8	NE	NE	NE	NE	Y
TP-21	1989	NA	1241.0	14.0	1227.0	NE	NE	NE	NE	Y
TP-22	1989	NA	1255.0	11.0	1244.0	11.0	1244.0	NE	NE	Y
TP-23	1989	NA	1252.3	12.0	1240.3	10.0	1242.3	NE	NE	Y
TP-24	1989	NA	1243.4	12.0	1231.4	NE	NE	NE	NE	Y
TP-25	1989	NA	1236.2	10.0	1226.2	NE	NE	NE	NE	Y
TP-26	1989	NA	1248.5	8.5	1240.0	8.5	1240.0	NE	NE	Y
TP-27	1989	NA	1251.0	NA	NA	NE	NE	NE	NE	Y
TP-28	1989	NA	1242.1	9.5	1232.6	NE	NE	NE	NE	Y
TP-A	1989	NA	1255.0	9.0	1246.0	9.0	1246.0	NE	NE	Y
TP-B	1989	NA	1258.0	9.0	1249.0	NE	NE	NE	NE	Y
TP-C	1989	NA	1257.8	11.5	1246.3	NE	NE	NE	NE	Y
TP-D	1989	NA	1252.0	8.5	1243.5	8.5	1243.5	NE	NE	Y
MW-7	1989	Exploration Technology	1255.7	234.5	1021.2	21.0	1234.7	44	1211.7	Y
MW-8R	1989	Exploration Technology	1256.1	207.0	1049.1	21.5	1234.6	44.0	1212.1	Y
MW-9	1989	Exploration Technology	1255.4	131.5	1123.9	21.5	1233.9	44.0	1211.4	Y
TP-100	1991	NA	1255.0	20.0	1235.0	NE	NE	NE	NE	Y

Table 2
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Existing Soil Borings for Landfill Property
Vernon County Landfill

Soil Boring Nomenclature	Year Installed	Drilling Company	Ground Elevation (feet NGVD)	Soil Boring Depth (feet bgs)	Bottom Elevation (feet NGVD)	Depth to Weathered Bedrock (feet bgs)	Weathered Bedrock Elevation (feet NGVD)	Depth to Competent Bedrock (feet bgs)	Competent Bedrock Elevation (feet NGVD)	Boring Log Available (Y/N) [1]
Borings outside 300-feet of the Proposed Expansion										
TP-101	1991	NA	NA	26.0	NA	NE	NE	NE	NE	Y
TP-102	1991	NA	NA	18.0	NA	18.0	NA	NE	NE	Y
MW-1R	1994	Ace Well Drilling	1245.0	166.0	1079.0	55.0	1190.0	74.0	1171.0	Y
MW-1PR	1994	Ace Well Drilling	1245.0	126.0	1119.0	57.0	1188.0	57.0	1188.0	Y
MW-1RZ	2003	Traut Hydro Tech	1244.0	185.0	1059.0	75.0	1169.0	98.0	1146.0	Y
MW-13P	2003	Traut Hydro Tech	1224.5	100.0	1124.5	49.0	1175.5	75.0	1149.5	Y
B-1	2021	Mathy Construction Co	1252.8	25.0	1227.8	13.0	1239.8	25.0	1227.8	Y
B-2	2021	Mathy Construction Co	1252.2	50.0	1202.2	47.0	1205.2	50.0	1202.2	Y
B-3	2021	Mathy Construction Co	1251.1	11.0	1240.1	3.0	1248.1	11.0	1240.1	Y
B-5	2021	Mathy Construction Co	1257.4	19.0	1238.4	13.0	1244.4	19.0	1238.4	Y
B-6	2021	Mathy Construction Co	1254.9	12.0	1242.9	10.0	1244.9	12.0	1242.9	Y
B-8	2021	Mathy Construction Co	1258.7	38.0	1220.7	35.0	1223.7	38.0	1220.7	Y
B-9	2021	Mathy Construction Co	1253.7	42.0	1211.7	38.0	1215.7	42.0	1211.7	Y
B-11	2021	Mathy Construction Co	1253.9	17.0	1236.9	11.0	1242.9	17.0	1236.9	Y
B-12	2021	Mathy Construction Co	1259.9	47.0	1212.9	35.0	1224.9	47.0	1212.9	Y
B-13	2021	Mathy Construction Co	1258.2	43.0	1215.2	37.0	1221.2	43.0	1215.2	Y
B-14	2021	Mathy Construction Co	1257.3	49.0	1208.3	40.0	1217.3	49.0	1208.3	Y

Notes:

NA - Information not available.

(1) - If boring log isn't available but weathered and competent bedrock elevations are present. The elevations were taken from previously submitted site figures.

NE - Not encountered.

* - Only page 1 of the soil boring log is available.

- Boring may not to be included within the feasibility report cross-sections due to lack of boring log.

- Boring may not to be included within the feasibility report cross-sections due to greater than 300-feet from the proposed expansion and the existing landfill footprint.

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Volume 3 of 4

Feasibility Report - Proposed Eastern Expansion (WDNR License No. 3268)

Vernon County Landfill

Viroqua, Wisconsin

VERSW 167824 | September 11, 2023

SEH
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Appendix J

Field Investigation Summary

Building a Better World for All of Us®

MEMORANDUM

TO: Brian Kent

FROM: Robert Hawkins, Ben Kolter, Aaron Kutz, PG (WI), Melanie Niday, PG (WI), Mark Sherrill, PG (WI), Melissa Lindenfelser

DATE: August 22, 2023

RE: AGIP Field Investigation Procedures
SEH No. VERSW 167824 14.00

INTRODUCTION

On December 13, 2021, an Alternate Geotechnical Investigation Program (AGIP) request was sent to Ms. Carolyn Cooper, Wisconsin Department of Natural Resources (WDNR) district hydrogeologist, requesting approval for an alternative geotechnical program as allowed under NR512.09 Wis. Adm. Code. The WDNR accepted the AGIP in a letter submitted to Vernon County Landfill on March 30, 2022, with several comments that warranted additional discussion. The WDNR and SEH also had a virtual meeting on June 9, 2022, to discuss the WDNR comments. A Response to AGIP Acceptance Letter was submitted to the WDNR on July 27, 2022, which outlined the comments from the March 30, 2022, acceptance letter and discussion from the June 9, 2022, meeting.

The AGIP approval (WDNR, March 30, 2022) letter gave approvals and exemptions for the following:

- NR507.05(2) Wis. Adm. Code for bedrock coring – it was agreed upon that coring would be attempted on one borehole, MW-14WT, and natural gamma geophysics would also be completed in lieu of coring all borings.
- NR507.06(1) Wis. Adm. Code for use of drilling fluids - drilling fluids can be used when conditions warrant it and an exemption from the code isn't required.
- NR512.09(4) Wis. Adm. Code for use of soil laboratory data collected during past investigations - use of previously collected data is allowed. Previously collected data and newly acquired data must be submitted with the feasibility report.
- NR507-05(1)(e) Wis. Adm. Code for retention of core samples – the department does not expect core samples from previously completed boring logs be available; however, core samples obtained from newly drilling borings should be retained through the feasibility determination.
- NR512.09(1) and (2) Wis. Adm. Code for use of existing borings and wells within 300 feet of the proposed expansion - use of existing borings and wells along with the proposed borings and wells meets the numerical requirement for boring and wells.
- NR512.11(2) Wis. Adm. Code for use of all borings in the geological cross-sections – the department concurs that if a historical boring log is not available then it cannot be used. All available boring logs within 300 feet of the proposed expansion should be provided.
- NR507.14 and NR 140.23 Wis. Adm. Code for use of soil boring and well information not on WDNR forms – the department understands some historic soil boring logs may be recorded on

non-department forms and therefore may not capture all of the information recorded on current department forms.

Based on a proposed horizontal landfill expansion area of 4 acres, a geotechnical investigation including 10 soil borings, five water table monitoring wells, and four piezometers is required. The accepted AGIP includes utilization of data from 18 existing soil borings, three existing perched water table monitoring wells (MW-4P, MW-5A, and MW-12), two existing regional water table monitoring wells (MW-5 and MW-14), and five existing nested piezometers (MW-3, MW-6, MW-10, MW-11, and MW-14Z). In order to meet the regulatory requirements and further investigate the subsurface in the area of the proposed expansion, eight new borings (B-18, B-19, B-20, B-21, MW-14WT, MW-15WT, MW-16, and MW-17WT) were performed to provide bedrock data and additional soil data. Four new perched water table monitoring wells (MW-14WT, MW-15WT, MW-16WT, and MW-17WT), and one new piezometer (MW-16) were also completed during the investigation of the proposed expansion area to meet regulatory requirements and provide groundwater data in accordance with the approved AGIP.

The field investigation included completion of soil borings, construction and development of monitoring wells/piezometers, field and laboratory geotechnical analysis, geophysics, in-field hydraulic conductivity testing, baseline water elevation monitoring, baseline groundwater monitoring, and survey.

Drilling and well installation was completed between August 22, 2022, and September 28, 2022, by Braun Intertec utilizing a track mounted CME 850 drill rig. Drilling oversight was provided by SEH geologists under the direction and supervision of a licensed Professional Geologist in Wisconsin. Well development, geophysics, groundwater monitoring, and in-situ hydraulic conductivity analyses were also conducted by SEH geologists and scientists. Groundwater sample analysis was performed by Eurofins Environmental Testing and boring and well survey was provided by Vernon County.

SOIL BORINGS

The proposed expansion encompasses approximately 4-acres of horizontal expansion located east of the existing Phase III cell, and approximately 5-acres of vertical expansion. Based on the size of the proposed horizontal expansion area, N 512.09(1)(b) Wis. Adm. Code requires that 10 soil borings be drilled and sampled to a depth of at least 25 feet below the proposed subgrade or to bedrock, whichever is less. Prior to site investigation, approximately 95 borings were completed at the site, four of which were included in the AGIP to assess the proposed expansion area.

Drilling Program

To supplement the existing soil boring information, the following additional eight soil borings were installed to assess soil and bedrock conditions and bedrock elevations:

- MW-14WT, MW-15WT, MW-16WT/MW-16, and MW-17WT were drilled outside the landfill expansion footprint but fall within 150 feet of the proposed waste boundary sidegradient and/or upgradient of the landfill expansion. Soil borings for wells MW-14WT, MW-15WT, MW-16WT, and MW-17WT were advanced into the water table for shallow well installation. The soil boring for well nest MW-16 was advanced below the water table to accommodate piezometer construction.
- The soil boring for wells MW-14WT, MW-15WT, MW-16WT/MW-16, and MW-17WT extended between 18 to 79 feet into bedrock which meets the bedrock requirement of NR 512.09(1) Wis. Adm. Code.
- Four (4) drilling locations (B-18, B-19, B-20, and B-21) fall within the landfill expansion footprint. Soil borings were advanced at least 25 feet below the proposed landfill subbase elevation, with

the exception of B-21 which was only completed 15 feet below the proposed landfill subbase elevation due to a subbase elevation error. This boring was completed for geotechnical purposes and is not needed to fulfill the required number of borings. Where bedrock was encountered; drilling into bedrock was also advanced as necessary to confirm bedrock.

Drilling and Sampling Methods

The soil borings were completed using hollow stem auger and mud rotary methods, with the exception of MW-14WT which attempted to core bedrock. The use of this drilling method for geotechnical investigation was justified based on geologic conditions limiting ability to advance the boring through competent bedrock and the failure of bedrock to be cored successfully during previous investigations. However, standard penetration test (SPT, ASTM D1586) samples could not be collected in the bedrock deposits. SPT samples were only collected in unconsolidated deposits to attain geotechnical soil samples and to classify subsurface lithologic conditions. In addition, bulk samples, thin-walled samples (ASTM D1587), and brass-lined samples were collected from fine grained deposits encountered at several locations in the area of investigation. Sample type was decided at the discretion of the SEH geologist on-site. No samples of saprolite (weathered bedrock) were able to be collected.

SPT, ASTM D1586 samples were collected in the borings at 2.5-foot intervals to a depth of 20 feet below ground surface (bgs) and at 5-foot intervals, thereafter. SPT samples were not collected in situations where competent bedrock would limit sample recovery. Soil samples collected during drilling were visually classified in the field by a geologist under the direction of a Wisconsin registered Professional Geologist in accordance with the Unified Soil Classification System (USCS, ASTM D2487-17 and D2488-00). The samples were subsequently transferred to glass sample bottles, labeled, and retained for analysis.

The drilling mud utilized during mud rotary drilling consisted of a bentonite/water slurry. The drilling method was switched from hollow stem auger to mud rotary at each well location at the discretion of the drill rig operator. Because of the presence of drilling mud in each borehole, groundwater conditions could not be readily observed or measured during the drilling. The drilling mud was removed from each monitoring well or piezometer during the development process.

Rock coring was attempted in boring location MW-14WT from 36.9 to 41.5 feet bgs and 52.5 to 60.5 feet bgs. A third core run was attempted, however it resulted in lost tooling, likely due to weathering, existing fractures, and/or layered heterogeneity of the bedrock and coring was not able to be continued. Drilling had to resume using mud rotary methods.

Drilling Documentation

Upon completion of drilling, some soil borings were converted to monitoring wells or piezometers. The remainder of the boreholes were abandoned in accordance with NR141 Wis. Adm. Code requirements. Soil boring logs from the 2022 investigation are included in **Attachment A**. Borehole abandonment forms from the 2022 investigation are included in **Attachment B**. A summary of survey, depths, and geologic conditions for the eight soil borings completed in 2022 is provided in **Table 1**. The locations of the soil borings, monitoring wells, and piezometers for the proposed expansion are illustrated on **Plan Sheet 3**. All soil samples not consumed by geotechnical analysis that were collected during the 2022 field investigation for the proposed expansion have been retained. The soil samples will be retained until a feasibility determination is obtained. Upon receipt of the feasibility determination, Vernon County Landfill personnel will be notified to determine the subsequent disposition of the soil samples.

MONITORING WELLS AND PIEZOMETERS

Based on the size of the horizontal expansion area, NR512.09(2) Wis. Adm. Code required the evaluation of five water table wells and four piezometers. In accordance with the AGIP and to comply with the requirement of NR512(2) Wis. Adm. Code, soil boring information and background water quality data from four existing perched water table monitoring wells (MW-3, MW-4P, MW-5A, and MW-12), two existing regional water table monitoring wells (MW-5 and MW-14), and four existing nested piezometers (MW-6, MW-10, MW-11, and MW-14Z) were also utilized to establish conditions of the proposed landfill expansion. These existing monitoring wells and piezometers are located either within the landfill expansion footprint, or within 300 feet of the footprint.

Well Installation Program

In accordance with NR504.09(2)(d), over half of the wells and piezometers are in, or within 150 feet of the proposed limits of filling. These wells include existing wells MW-5, MW-5A, MW-14, and MW-14Z, and the newly installed wells MW-14WT, MW-15WT, MW-16WT, MW-16, and MW-17WT. The drilling program conducted in 2022 included the installation of four perched water table monitoring wells (MW-14WT, MW-15WT, MW-16WT, and MW-17WT) and one piezometer (MW-16). A summary of newly installed monitoring wells and piezometers is as follows:

- Well MW-14WT was installed to the northeast and upgradient to the landfill expansion. Well MW-15WT was installed east and sidegradient of the landfill expansion. Well MW-16WT was installed east and sidegradient to the landfill expansion. Well MW-17WT was installed southeast and downgradient to the landfill expansion. The monitoring wells were constructed with either a 10-foot or 15-foot screen.
- Piezometer MW-16 was nested with the shallow water table well MW-16WT. The piezometer was constructed with a 5-foot screen situated a minimum of 15-feet below the bottom elevation of the shallow well.

Well Installation Methods

The monitoring wells and piezometers were installed following completion of the associated soil boring described above. Because groundwater conditions could not be observed during drilling, determining an appropriate depth of the proposed water table well at the four drilling locations presented a challenge. Similar issues for establishing water levels during drilling was encountered during past well installations. Therefore, an attempt to estimate depth to groundwater was made by flushing the drilling mud out of the borehole with clear water and allowing the borehole to sit overnight; depth to water then was measured the next day and used to establish well construction depth. In most cases, this approach was adequate. However, this method for estimating the depth to groundwater cannot account for several other factors including:

- Seepage of water and or drilling mud into the formation causing localized saturated pores in the vicinity of the borehole.
- Smearing of mud on the borehole wall that restricts a hydraulic connection with the formation therefore cannot provide accurate water levels.
- Vertical hydraulic gradients in the formation skewing depth to water measurements in deeper borings versus water table conditions.
- Seasonal variations in water table conditions.

As a result, two monitoring wells (MW-15WT and MW-16WT) that were installed are currently dry. Although dry wells would appear to have limited value for hydrogeologic investigation purposes, the fact the wells are dry has provided essential information to understanding the site hydrogeology as indicated in the Feasibility Report.

Monitoring wells and the piezometer were constructed using 2-inch diameter, PVC screen, coupled with 2-inch, Schedule 40 or 80 PVC riser. All monitoring wells were constructed with a 10-foot or 15-foot screened interval. The piezometer was constructed a 5-foot screen. The borehole annular space was filled with a filter pack that extended approximately 0.5 to 5 feet above the top of the screen. A layer of fine sand was placed above the filter pack and a layer of bentonite seal was placed above the fine sand. The bentonite seal was then followed by a high-solids bentonite grout to approximately 2 feet below the ground surface. Piezometers were then competed with a protective casing with a locking vented cap, and bollards. In scenario's where excessive water loss was observed during the drilling process, the high-solids bentonite grout was left to settle overnight. The annular space was re-filed to 2 feet bgs the next day, and the well construction was completed.

The observation and documentation of well installation was provided by SEH geologists under the direction and supervision of a licensed Professional Geologist in Wisconsin. Final well construction logs prepared by Braun Intertec are included within **Attachment C**. A summary of survey, depths, and screened geologic conditions for the monitoring wells and piezometer completed in 2022 is provided in **Table 2**. The locations of the monitoring wells and piezometers for the proposed expansion are illustrated on **Plan Sheet 3**.

WELL DEVELOPMENT

Following installation, wells were developed on November 2, 2022, in substantial conformance with NR141.21 and NR507.07 utilizing a surge block, pump, and well dedicated tubing. Procedures and equipment used for initial development were recorded and field forms are provided in **Attachment D**. From wells that produced sufficient water, at least ten times the standing water volume in the well and sand pack was removed from each newly installed well with appropriate documentation of stabilization/recovery parameters. Due to slow recharge (MW-16WT and MW-17WT) and a dry well (MW-15WT), water was added to a few wells to assist in well development. The volume of water added was recorded and a sample was collected from the source of the water added. Approval was granted by the WDNR via email on October 14, 2022, to add water to assist in well development. No dispersing agents, acids, or disinfectants were added to the well to assist development. Well development forms from the new wells installed for the 2022 investigation are included in **Attachment D**.

BOREHOLE GEOPHYSICS

Borehole geophysics was incorporated into the field program in response to WDNR comments regarding the limited recovery to proposed sampling methods for bedrock at the site. Borehole geophysics was proposed at each of the four new well locations (MW-14WT, MW-15WT, MW-16, and MW-17WT) and at seven existing well locations (MW-1, MW-1R, MW-2, MW-5, MW-6, MW-7, and MW-12). However, borehole geophysics could not be completed at MW-16WT/MW-16 due to access issues during the field program. In addition, when well nests were present, geophysics was attempted to be completed within the deepest well as representative for the area, but shallower wells were used if the deepest wells were not accessible.

Geophysical Logging Program

The existing and new wells were gamma logged to aid with lithologic correlation and interpretation of soil strata across the site. A gamma log provides a continuous record of the total natural gamma radiation (photo emissions) of soil and rock strata detected adjacent to a borehole or well. Gamma radiation found in soil and rock strata is generated by the radioactive decay of potassium 40, uranium 238 and thorium 232. A gamma log most often indicates increasing radiation as the content of potassium-rich clay increases in soil or rock. As a result, clays, claystones and shales can be distinguished from quartz sands, sandstones or carbonate rocks such as dolomite or limestone by examining the relative difference in gamma counts per second (cps). Gamma logs can then be compared to each other and utilized for determining and correlating the underlying stratigraphy across the study area.

Borehole geophysics conducted at each well location used natural gamma radiation, which can be collected through the existing well casing since other geophysical method conditions could not be met like the open hole requirements of caliper logging or the open hole filled with water or drilling fluid requirements (i.e., electric, caliper, resistivity spontaneous potential, etc.). The gamma logging in this investigation utilized a portable Mount Sopris Model 5MXA-1000 Matrix Acquisition Console. This unit includes a 200-meter mini-motorized winch and a digital interface. The probe used in conjunction with this system was a Mount Sopris Model 2PGA-1000 Poly-Gamma Probe. The logger was operated from the back of the field vehicle and powered by a portable Yamaha generator. In addition, LoggerSuite Software (Version 13.3.2) was utilized during data acquisition to display and save data in the field while data was collected. WellCad (Version 5.1) Software was used to process the data and format to other software for presentation and data interpretation.

Geophysical Logging Procedure

Gamma logging was completed within the casing/screen of existing and new wells. Prior to logging the wells containing dedicated pump systems, the pump assemblies were removed (and reinstalled) following the logging procedure.

The logging procedure began by setting up a winch and tri-pod system to guide the probe and cable. The probe was then placed inside the well casing and referenced to ground surface. The data acquisition program was then activated and logging parameters, including the starting reference depth were entered. The probe was then lowered to the bottom of the well while monitoring the data to ensure a gamma response was indicated. Data was recorded as the probe was being lowered down the well and as the probe was raised from the bottom of the well. Logging speed was conducted at a standard rate of approximately 15 feet per minute. The depth digitized interval (frequency per reading) for logging was 0.1 feet. At the completion of the logging process, a field plot of the data was reviewed and evaluated for correlation with available geologic information. Stored data files were saved for further processing following the field investigation.

Geophysics Logging Documentation

Data files stored during the field investigation were processed following the field investigation using WellCad (Version 5.1) Software. The data was processed and formatted to other software such as gINT and AutoCAD for presentation and data interpretation. On the logs, the relatively high or low gamma counts produce high or low spikes, which can typically be traced from one log to another by identifying similar gamma spikes with the context of similar vertical sequences. These laterally traceable spikes are called marker horizons, and in some cases, they may be traced (or correlated) over great distances before they become obscure. For the purposes of this study, five marker horizons, designated in

ascending order as H1 through H5, were selected as illustrated on geologic cross-sections. Natural gamma radiation logs and gamma log marker horizons were added to existing soil boring logs and are provided within **Attachment E**.

LABORATORY AND FIELD TESTING

As stated in NR507.05 Wis. Adm. Code, soil samples collected in 2022 will be retained by the laboratory until the WDNR approves the FR.

Soil Geotechnical Analysis

NR512.09(4)(a) requires that for each major soil unit, at least five representative samples be analyzed for grain-size distribution and Atterberg limits. The geotechnical program fulfilled the geotechnical requirements of NR512.09(1) and (2). The unconsolidated geologic unit at the site is residuum which ranges from clay to gravel. At least five fine-grained residuum and five coarse-grained residuum samples were analyzed for grain-size and plasticity (Atterberg limits). Saprolite and bedrock are the other geologic units encountered on-site but no samples were able to be collected for grain-size or Atterberg limits analysis. Since the rule NR512.09(4)(a) Wis. Adm. Code states that Atterberg limits are needed “as appropriate for the particular type of material”, no exemption was needed for the inability to analyze saprolite and bedrock for Atterberg limits.

Soil samples collected during 2022 from the additional borings were examined to assess the color, degree of saturation, and geologic origin. Soil samples were also observed for the presence of conspicuous structures, mottling, voids, layering, lenses, and seams. Samples were classified in the field according to the USCS. The soil descriptions and classifications are included on the boring logs (**Attachment A**). The capitalized symbol on the boring logs corresponds to the USCS group symbol. Strata contact lines on the boring logs represent approximate soil boundaries between soil types; changes in soil type may be gradual in both the horizontal and vertical directions, and no actual sharp contacts may exist. Variations may exist in both the horizontal and vertical direction between borings.

Geotechnical laboratory results are summarized within **Table 3** and the full geotechnical report is provided within **Attachment F**.

Coefficient of Permeability

NR512.09(4)(b) Wis. Adm. Code requires that hydraulic conductivity be conducted on two representative soil samples from each major fine-grained unit. Two coefficient of permeability tests were completed on the fine-grained residuum unit. The method used was ASTM D5084, which is a falling head flexible wall tests where samples were collected via thin wall tubes.

The coefficient of permeability (ASTM D5084) test was conducted on two soil samples from fine-grained residuum encountered within borings MW-14WT and MW-16. A summary of the 2022 coefficient of permeability values is provided in **Table 3** with the full geotechnical report is provided within **Attachment F**. The requirement for laboratory hydraulic conductivity testing stated in NR512.09(4)(b) Wis. Adm. Code were met for all applicable units on-site during the 2022 field investigation.

DRILLING WATER AND POST WELL DEVELOPMENT ANALYSIS

Water used during drilling, decontamination, and well development was obtained from Vernon County Highway Department. Samples of the water source were tested for the parameters required by NR507.18. The analytical report identified that 1,1,2,2-Tetrachloroethane were detected at low levels in the water used for drilling, decontamination, and well development. These compounds are generally

found in public drinking water supplies as they are a biproduct of the use of chlorine in drinking water treatment. Total suspended solids (TSS) and chemical oxygen demand (COD) were both below detection limits. Analytical results for water source are provided in **Attachment G**.

Post well development water samples were collected and analyzed for TSS and COD in accordance with NR507. The analytical results for the post well development water samples are included on the well development forms included in **Attachment D** and within the laboratory reports provided within **Attachment G**.

IN-FIELD HYDRAULIC CONDUCTIVITY ANALYSIS

NR 512.09(4)(d) Wisconsin Administrative Code requires that in-field test be conducted on each well to determine the in-situ hydraulic conductivity as part of the feasibility study for landfill development. To fulfill this requirement, SEH field staff completed in-field hydraulic conductivity analysis at six monitoring wells or piezometers proximal to the proposed expansion area on May 18 and 19, 2023. These monitoring wells/piezometers include MW-1R, MW-2P, MW-12, MW-14WT, MW-16, and MW-17WT. In-field hydraulic conductivity analysis was not able to be performed on wells MW-15WT and MW-16WT due to dry conditions. Aqtesolv® data analysis is detailed in **Attachment H**. A summary of hydraulic conductivities from the 2023 in-field testing is provided in **Table 4**.

In-Field Data Collection

The data collection process for hydraulic conductivity analysis was preformed using in-field single well aquifer response tests, specifically through the use of slug tests. A slug test consists of displacing a volume of water in a well and monitoring the recovery of the aquifer to the pre-stressed condition. The insertion or removal of a slug tool from a well is equivalent to displacing an equal volume of water. By monitoring the transient water level in the well, it is possible to estimate the conductivity immediately surrounding the sand pack.

The slug tool used to displace water in the monitoring wells was a nominal 1.5-inch by 48-inch Solid $H_{(o)}$ Slug® designed by Midwest Geosciences Group. This water-tight assembly will displace approximately 24 inches of water in a 2-inch diameter monitoring well. The water elevation and time required for the well to dissipate the water and return to the initial static level was measured using an In-Situ pressure transducer (vented Level TROLL 700 Data Logger with wireless TROLL com). The unit provides uninterrupted, real-time water level monitoring using a pressure sensor when submerged at a fixed level under the water surface and measures the equivalent hydrostatic pressure of the water above the sensor diaphragm to calculate the total water depth. Water elevation readings were collected at half second to one second intervals.

The pressure transducer was set at a depth greater than the slug was lowered, taking care not to set the transducer on the bottom of the well. The transducer was secured in place (using tape, hose clamps, twine, etc.) with care being taken not to pinch the lead to the pressure transducer. Once in place, the pressure transducer was checked via monitoring the water column readings above the transducer on the wireless TROLL com through Bluetooth to the VuSitu Phone application. Prior to insertion of the slug, measurements of the water column were taken in the well to ensure the water level was at equilibrium and to check for background fluctuations in the water column.

The decontaminated slug was submerged into the water as quickly as possible, without dropping, as the impact on the water surface may damage the pressure transducer or create oscillations in the water level. Once in place, the slug was secured so it did not move. This was considered the “falling head” phase of

the slug test, as the transducer measured the rate at which the water level took to return to the initial static elevation before the insertion of the slug.

After the well had dissipated at least 90 percent of the water deflected as part of the falling head phase of the test (or 80 percent if well recovery was longer than 4 hours), the slug was removed from the well as quickly as it was submerged to initiate the "rising head" phase of the slug test. This created a drop in water level and the transducer measured the rate at which the water level in the well took to recover to the initial static water level before the start of the test. This rising head phase of the test was considered complete after the water in the well has recovered to at least 90 percent of its pre-stressed level (or 80 percent if well recovery was longer than 4 hours). The data logger was set up to record water levels during the recovery phase of the test at the same schedule as the dissipation phase of the test was recorded (at 0.5 to 1 second intervals).

Post Collection Analysis of Field Data

The data collected from each, rising head and falling head, slug test (performed at the six monitoring wells and piezometers listed above) was downloaded from the VuSITU application. Results from the slug tests were analyzed within Aqtesolv® Aquifer Data Analysis software.

Two mathematical solutions within Aqtesolv® were utilized in determining hydraulic conductivity.

1. Bouwer and Rice (1976) solution were used on 11 out of 12 slug tests. This solution allowed for a correction for the effective porosity of the filter pack when screened across the water table.
    a. Curve matching solutions accounted for double-straight line effects for wells screened across the water table and additionally matched to the recommended normalized head ranges for each method's straight-line match.
2. Springer-Gelhar solution was used only on the MW-1R Rising Head Test to account for an underdamped (oscillatory) response.

The purpose of these simulated 2-D groundwater models was to approximate hydraulic conductivity values for the near vicinity geologic material. Results for all tests are depicted in **Attachment H**.

2023 Results

A summary of hydraulic conductivities from the 2023 in-field testing is provided in **Table 4**. All wells analyzed for hydraulic conductivity during the 2023 investigation were screened within dolostone or sandstone bedrock.

As discussed above, both Rising Head and Falling Head slug tests were performed as part of the 2023 hydraulic conductivity analysis. Comparison of the two tests at each well/piezometer generally produced hydraulic conductivity values that were within acceptable ranges of each other and therefore, all results are presented on **Table 4**. Comparison of slug tests completed during 2023 across the site gives a hydraulic conductivity range of 9.5E-2 cm/sec (MW-1R) to 1.0E-5 cm/sec (MW-17WT), indicating some heterogeneities within the bedrock. After review of the soil boring log for MW-1R, the high hydraulic conductivity may be due to a 2-foot fracture noted immediately below the monitoring well screen. The lower hydraulic conductivity at MW-17WT in most likely due to the clayey sandstone that the well is screened within.

Slug tests were performed on well MW-12 as part of the 2003 Feasibility Study and tested again in 2023 for comparison. The 2023 result for the Rising Head test was an order of magnitude lower at 1.18E-03 cm/sec compared to 2003 result of 1.27E-02 cm/sec. In reviewing the data, we found that the 2003 test

was only run for 10 seconds where the earliest part of the curve would have had more influence from the filter pack. The 2023 Rising Head test was run for nearly 5 minutes. In accordance with Butler (1998), the head range selected to obtain the most reliable matching results for solutions was between 30 and 100 seconds. Therefore, the 2023 slug test data and analysis are considered more representative of hydraulic conductivity for the vicinity of well MW-12.

BASELINE WATER ELEVATION MONITORING

Groundwater level measurements and sampling activities for the proposed expansion were performed in accordance with NR512.09(4)(f) and NR512.09(4)(g). Depth-to-water measurements were collected using an electronic water level indicator and were recorded to the nearest 0.01 foot. For baseline water elevations, water level measurements were taken monthly for a six-month period from December 2022 through May 2023. Water levels were also collected from all existing wells for the entire solid waste facility. Depth-to-water measurements recorded in the field were used to calculate groundwater elevations. All available water elevation data collected over the past five years for all monitoring wells and piezometers at the site are provided on **Table 5**. A map showing the location of all site monitoring wells is provide on **Plan Sheet 3**.

The groundwater elevations calculated for water table wells and piezometers were used to establish groundwater flow direction, vertical and horizontal gradients, and the position of the water table. A high perched water table map and a high regional water table map (**Plan Sheet 4 and 6, respectively**) was prepared using the data collected from the May 30, 2023, monitoring event. A low perched water table map and a low regional water table map (**Plan Sheet 5 and 7, respectively**) was prepared using the data collected from the January 24, 2023, monitoring event. An upper and lower potentiometric map (**Plan Sheet 8 and 9**, respectively) were also prepared using the data collected from the May 30, 2023, monitoring event. These groundwater contour maps are discussed in further detail within Section 4.4.2.3 of the Feasibility Report.

BASELINE GROUNDWATER MONITORING

Baseline groundwater monitoring was completed in accordance with NR 512.09(4)(g) Wis. Adm. Code which stipulates that at least four rounds of baseline groundwater monitoring must be performed on all observation wells and piezometers and submitted with the Feasibility Report.

Baseline groundwater monitoring was completed at the four monitoring wells and one piezometer installed during 2022 (**Table 2**). These four wells and one piezometer were sampled every month starting December 2022 through May 2023. Note, that MW-15WT and MW-16WT were dry during all events.

Groundwater samples collected from the monitoring wells and piezometers used for observation for the landfill expansion were analyzed per NR507.17 and NR507.18 requirements for the baseline and detection monitoring parameters (summarized in NR507 and NR503) for landfills accepting municipal solid waste and construction and demolition material. Some locations were also sampled monthly for the analysis of Public Health and Public Welfare parameters (summarized in NR507.18(2)). VOCs were also analyzed at some monitoring locations during the baseline monitoring events. A list of the parameters utilized at each monitoring location during baseline monitoring is provided on **Table 6**. The analytical results for each monitoring location are provided on **Table 7**. The laboratory reports for the baseline groundwater quality monitoring for the proposed expansion are provided in **Attachment I**.

Additional background groundwater quality sampling events are ongoing at the proposed expansion. Once enough valid baseline monitoring samples are collected, well-specific standards will be developed, as applicable. An update on the status of well-specific standards will be provided as part of the Plan of Operation report.

SURVEY

Horizontal locations and vertical elevations (i.e., ground surface, top of casing, and top of protective casing) were surveyed for the borings and wells installed as part of the AGIP. Survey activities were performed on October 3, 2022, by Vernon County. Horizontal locations are referenced to the Vernon County coordinate system (Datum). The grid system is based in the southwest and southeast ¼ of Section 15, T13N, R4W, City of Viroqua, Vernon County, Wisconsin. Vertical elevations are referenced to feet above mean sea level (NAVD88(2011)) datum. Elevations and horizontal locations were measured to 0.01 feet. Final survey elevations for 2022 soil borings and 2022 wells are shown on **Table 1** and **Table 2**, respectively.

TABLES

Table 1 – 2022 Soil Boring Summary

Table 2 – 2022 Monitoring Well Installation Summary

Table 3 – 2022 Geotechnical Testing Summary

Table 4 – 2023 In-Field Hydraulic Conductivity Summary

Table 5 – Groundwater Elevations (2018-2023)

Table 6 – Baseline Monitoring Parameters

Table 7 – Baseline Monitoring Results

ATTACHMENTS

Attachment A – 2022 Soil Boring Logs

Attachment B – 2022 Abandonment Forms

Attachment C – 2022 Well Construction Logs

Attachment D – 2022 Well Development Forms

Attachment E – 2022 Geophysics Boring Logs

Attachment F – 2022 Geotechnical Testing Report

Attachment G – Post Well Development Laboratory Reports

Attachment H – In-Field Hydraulic Conductivity Results

Attachment I – Baseline Monitoring Laboratory Reports

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Tables

Table 1 - 2022 Soil Boring Summary
Table 2 - 2022 Monitoring Well Installation Summary
Table 3 - 2022 Geotechnical Testing Summary
Table 4 - 2023 In-Field Hydraulic Conductivity Summary
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Table 1
2022 Soil Boring Summary
Vernon County Landfill - Proposed Eastern Expansion

Boring ID	Coordinates*		Ground Surface Elevation (feet NAVD)	Depth to Bedrock (feet bgs)	Bedrock Elevation (feet NAVD)	Subbase Elevation (feet NAVD)	Total Depth of Boring (feet bgs)	Bottom Elevation of Boring (feet NAVD)
	Northing	Easting						
MW-14WT	164748.09	715686.57	1247.15	30.0	1217.2	outside	109.0	1138.2
MW-15WT	164381.61	715725.56	1220.61	69.5	1151.1	outside	99.0	1121.6
MW-16WT	163940.42	715674.43	1184.70	79.5	1105.2	outside	76.0	1108.7
MW-16	163930.87	715670.83	1184.27	79.5	1104.8	outside	98.0	1086.3
MW-17WT	163691.07	715688.32	1196.43	65.0	1131.4	outside	93.0	1103.4
B-18	164512.88	715479.03	1238.99	30.0	1209.0	1239	30.0	1209.0
B-19	164379.6	715476.66	1233.32	28.0	1205.3	1234	28.0	1205.3
B-20	164063.87	715517.89	1215.81	30.0	1185.8	1219	30.0	1185.8
B-21	163857.25	715398.47	1226.12	NE	NE	1210	31.0	1195.1

Notes:

bgs - Below ground surface.

NE - Not encountered.

Table 2
2022 Monitoring Well Installation Summary
Vernon County Landfill - Proposed Eastern Expansion

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NAVD)	Top of Casing Elevation (feet NAVD)	Well Depth (feet bgs)	Screen Length (feet)	Screen Interval Elevation (feet NAVD)	Monitoring Point	Screened Geologic Unit
125	MW-14WT	09/20/22	1247.15	1249.78	106.0	15.0	1143.8 - 1158.8	Perched Water Table	Dolostone
127	MW-15WT	09/28/22	1220.61	1223.38	85.0	10.0	1138.4 - 1148.4	Perched Water Table	Sandy Dolostone
129	MW-16WT	09/21/22	1184.70	1187.51	75.0	10.0	1112.5 - 1122.5	Perched Water Table	Sandy Dolostone to Shale
131	MW-16	08/25/22	1184.27	1186.95	97.0	5.0	1090.0 - 1095.0	Piezometer/Undefined	Sandy Dolostone
133	MW-17WT	09/26/22	1196.43	1199.24	92.0	10.0	1107.2 - 1117.2	Perched Water Table	Weathered Sandstone

Notes:
bgs - below ground surface.

Table 3
2022 Geotechnical Testing Summary
Vernon County Landfill - Proposed Eastern Expansion

Boring ID	Sample Depth (feet)	USCS Soil Classification	Moisture Content (%)	Grain-size Distribution				Atterberg Limits			Standard Proctor (ASTM D698)		Modified Proctor (ASTM D1557)		Coefficient of Permeability (ASTM D5084) (cm/sec)[1]	Consolidated Undrained Test (total cohesion, tsf)	Consolidated Undrained Test (effective cohesion, tsf)	Density (pcf)
				Percent Gravel	Percent Sand	Percent Silt	Percent Clay	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Dry Density (pcf)	Optimum Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)				
Fine-Grained Residuum																		
B-18	0-2	CL	20	1.1	14.6	54.0	30.3	38	19	19	---	---	---	---	---	---	---	---
B-18	2-3.5	CH	27	0.0	14.4	20.4	65.2	64	24	40	---	---	---	---	---	---	---	---
B-18	4.5-6	CH	27	0.0	36.5	17.7	45.8	51	19	32	---	---	---	---	---	---	---	---
B-18	12-13.5	CH	27	0.0	29.5	14.2	56.3	72	23	49	---	---	---	---	---	---	---	---
B-18	17-18.5	CH	16	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-19	0-2	CH	---	0.0	25.5	30.5	44.0	50	17	33	105.0	19.6	116.7	15.0	---	---	---	---
B-19	2-3.5	CH	16	23.7	22.7	22.1	31.5	52	19	33	---	---	---	---	---	---	---	---
B-19	4.5-6	CH	44	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-19	7-8.5	CH	53	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-19	9.5-11	CH	54	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-19	14.5-16	CH	40	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-19	17-18.5	CH	57	0.0	3.3	8.4	88.3	105	34	71	---	---	---	---	---	---	---	---
B-19	19.5-21	CH	57	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-20	0-2	CH	---	0.0	35.1	16.2	48.7	58	16	42	---	---	---	---	---	---	---	---
B-20	2-3.5	CL	19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-20	4.5-6	CL	27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-20	7-8.5	CH	33	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-20	9.5-11	CL	15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-20	12-13.5	CH	30	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-20	14.5-16	CH	46	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-20	17-18.5	CH	39	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-21	0-2	CH	---	0.0	25.4	26.4	48.2	67	19	48	100.0	22.1	112.3	16.1	---	---	---	---
B-21	2-3.5	CH	24	0.0	24.5	29.3	46.2	50	16	34	---	---	---	---	---	---	---	---
B-21	4.5-6	CH	25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-21	7-8.5	ML	19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-21	9.5-11	CL	17	2.9	11.5	56.6	29.0	36	18	18	---	---	---	---	---	---	---	---
B-21	12-13.5	CL	19	0.0	6.2	65.2	28.6	36	22	14	---	---	---	---	---	---	---	---
B-21	14.5-16	CL	20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-21	17-18.5	CL	18	0.0	11.6	58.8	29.6	36	18	18	---	---	---	---	---	---	---	---
B-21	19.5-21	CL	19	0.0	4.9	63.6	31.5	40	19	21	---	---	---	---	---	---	---	---
B-21	24.5-26	CL	19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-21	29.5-31	CL	18	0.0	1.4	72.7	25.9	33	20	13	---	---	---	---	---	---	---	---
MW-14WT	7-8.5	CH	37	0.0	32.0	9.8	58.2	64	22	42	---	---	---	---	---	---	---	---
MW-14WT	26-28.5	CL	25	---	---	---	---	---	---	---	---	---	---	---	3.1E-08	---	---	101.2
MW-15WT	17-18.5	CH	46	0.0	2.6	7.5	89.9	109	36	73	---	---	---	---	---	---	---	---
MW-16	7-9	CL	---	---	---	---	---	43	22	21	---	---	---	---	---	0.9366	0.2976	---
MW-16	9.5-11.5	CL	24	0.0	3.9	66.0	30.1	37	21	16	---	---	---	---	3.0E-08	---	---	---
		Average	29.6	1.5	17.0	35.5	46.0	54.8	21.3	33.5	102.5	20.9	114.5	15.6	3.05E-08	0.9366	0.2976	101.2
		St. Dev.	13.16	5.58	12.04	23.25	19.62	21.91	5.34	17.82	3.54	1.77	3.11	0.78	7.07E-10	---	---	---
		Minimum	15.0	0.0	1.4	7.5	25.9	33.0	16.0	13.0	100.0	19.6	112.3	15.0	3.00E-08	0.9366	0.2976	101.2
		Maximum	57.0	23.7	36.5	72.7	89.9	109.0	36.0	73.0	105.0	22.1	116.7	16.1	3.10E-08	0.9366	0.2976	101.2
		Range	42.0	23.7	35.1	65.2	64.0	76.0	20.0	60.0	5.0	2.5	4.4	1.1	1.00E-09	0.0000	0.0000	0.0
Coarse-Grained Residuum																		
B-18	7-8.5	SP	10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-18	9.5-11	SC	15	0.0	58.6	8.9	32.5	39	15	24	---	---	---	---	---	---	---	---
B-18	14.5-16	SC	20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B-19	12-13.5	GC	33	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-16	24.5-26	SC	18	0.0	62.1	11.4	26.5	41	17	24	---	---	---	---	---	---	---	---
MW-17WT	4.5-6	SC	20	12.7	44.6	7.8	34.9	59	19	40	---	---	---	---	---	---	---	---
MW-17WT	7-8.5	SC	17	8.9	47.7	13.4	30.0	39	12	27	---	---	---	---	---	---	---	---
MW-17WT	9.5-11	SC	16	0.0	51.9	14.2	33.9	41	12	29	---	---	---	---	---	---	---	---
		Average	18.6	4.3	53.0	11.1	31.6	43.8	15.0	28.8	---	---	---	---	---	---	---	---
		St. Dev.	6.63	6.07	7.31	2.77	3.37	8.56	3.08	6.61	---	---	---	---	---	---	---	---
		Minimum	10.0	0.0	44.6	7.8	26.5	39.0	12.0	24.0	---	---	---	---	---	---	---	---
		Maximum	33.0	12.7	62.1	14.2	34.9	59.0	19.0	40.0	---	---	---	---	---	---	---	---
		Range	23.0	12.7	17.5	6.4	8.4	20	7	16	---	---	---	---	---	---	---	---

Notes:
(1) - ASTM D5084 (Falling Head Rising Tailwater) - Samples were collected via a thin wall tubes.
St. Dev. - Standard Deviation.

Table 4
2023 In-Field Hydraulic Conductivity Summary
Vernon County Landfill - Proposed Eastern Expansion

Monitoring Well ID	Well Type/ Groundwater Zone	Screened Geologic Unit	Test Type	Method	Screened Elevation (feet NAVD)	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
MW-1R	Regional Water Table	dolostone, hard	Falling Head	Springer-Gelhar	1082.6 - 1097.6	9.53E-02	270.17
MW-1R	Regional Water Table	dolostone, hard	Rising Head	Bouwer-Rice	1082.6 - 1097.6	6.67E-02	189.18
MW-2P	Perched Water Table	dolostone, hard	Falling Head	Bouwer-Rice	1128.0 - 1138.0	1.49E-03	4.23
MW-2P	Perched Water Table	dolostone, hard	Rising Head	Bouwer-Rice	1128.0 - 1138.0	1.64E-03	4.64
MW-12	Perched Water Table	dolostone with occasional small vugs	Falling Head	Bouwer-Rice	1119.9 - 1134.9	1.04E-03	2.93
MW-12	Perched Water Table	dolostone with occasional small vugs	Rising Head	Bouwer-Rice	1119.9 - 1134.9	1.18E-03	3.34
MW-14WT	Perched Water Table	dolostone	Falling Head	Bouwer-Rice	1141.2 - 1156.2	7.88E-03	22.35
MW-14WT	Perched Water Table	dolostone	Rising Head	Bouwer-Rice	1141.2 - 1156.2	9.94E-03	28.18
MW-16	Piezometer/Undefined	sandy dolostone	Falling Head	Bouwer-Rice	1087.3 - 1092.3	3.99E-04	1.13
MW-16	Piezometer/Undefined	sandy dolostone	Rising Head	Bouwer-Rice	1087.3 - 1092.3	3.71E-04	1.05
MW-17WT	Perched Water Table	clayey sandstone	Falling Head	Bouwer-Rice	1104.4 - 1114.4	2.43E-05	0.07
MW-17WT	Perched Water Table	clayey sandstone	Rising Head	Bouwer-Rice	1104.4 - 1114.4	1.04E-05	0.03
					Average:	1.55E-02	43.94
					Geometric Mean:	1.40E-03	3.96
					Minimum:	1.04E-05	0.03
					Maximum:	9.53E-02	270.17

Notes:
- All of the tests performed were "slug tests".
- All tests completed on 5/18-19/2023.

cm/sec - centimeters per second.
ft/day - feet per day.

Table 5
Existing Static Water Elevations for Landfill Property (2018-2023)
Vernon County Landfill - Proposed Eastern Expansion

WDNR Point ID Number	Well Name	Date Installed	Ground Elevation (feet NAVD)	Top of Casing Elevation (feet NAVD)	Well Depth (feet bgs)	Screen Length (feet)	Screen Interval Elevation (feet NAVD)	Well Type/ Groundwater Zone	Static Water Elevation by Date (feet NAVD)																
									3/14/2018	9/10/2018	3/11/2019	9/9/2019	3/9/2020	9/14/2020	3/1/2021	9/1/2021	3/1/2022	9/22/2022	12/20/2022	1/24/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023
102	MW-1P	12/30/1987	1236.4	1238.41	111.1	10.0	1125.4 - 1135.4	Perched Water Table	1132.01	1132.07	1132.55	1133.01	1132.6	1132.56	1131.67	1131.76	1131.42	1130.90	1130.02	1131.71	1131.70	1131.59	1131.98	1132.64
101	MW-1	12/30/1987	1236.4	1238.11	158.0	10.0	1078.5 - 1088.5	Regional Water Table	1098.79	1099.2	1103.13	1104.78	1103.09	1102.14	1096.58	1093.67	1091.85	1089.95	1089.70	1089.62	1089.62	1090.36	1092.19	1094.43
121	MW-1PR	1/12/1994	1245.0	1247.61	127.7	15.0	1119.9 - 1134.9	Perched Water Table	1134.86	1134.79	1135.15	1135.67	1135.4	1135.22	1134.80	1134.34	1134.23	1133.50	1134.07	1134.04	1134.22	1134.14	1134.72	1134.97
120	MW-1R	1/12/1994	1244.6	1247.25	164.6	15.0	1082.6 - 1097.6	Regional Water Table	1098.69	1099.14	1103.04	1104.59	1102.97	1102.03	1096.50	1093.58	1091.81	1089.95	1090.85	1090.60	1089.61	1090.36	1092.13	1094.46
123	MW-1RZ	3/12/2003	1244.0	1245.45	186.5	5.0	1057.5 - 1062.5	Piezometer, Upper Zone	1098.3	1098.75	1102.6	1104.2	1102.54	1101.58	1096.12	1093.19	1091.28	1089.51	1088.33	1089.11	1089.15	1089.84	1090.72	1093.86
104	MW-2P	1/17/1988	1252.5	1254.88	124.8	10.0	1128.0 1138.0	Perched Water Table	1139.82	1140.34	1140.64	1141.85	1141.03	1140.76	1139.87	1139.39	1139.33	1138.79	1138.81	1138.45	1139.36	1139.24	1139.98	1141.11
103	MW-2	1/17/1988	1252.5	1254.35	174.6	10.0	1078.3 - 1088.3	Regional Water Table	1092.72	1092.53	1095.31	1096.67	1095.32	1094.86	1091.56	1089.58	1087.79	1085.92	1086.19	1085.23	1086.01	1086.60	1087.51	1090.35
105	**MW-3**	**2/2/1988**	**1233.0**	**1235.25**	**180.0**	**5.0**	**1053.2 - 1058.2**	**Piezometer, Upper Zone**	**1077.49**	**1077.22**	**1080.8**	**1082.59**	**1080.42**	**1080.22**	**1076.06**	**1073.14**	**1070.69**	**1069.14**	**1068.69**	**1068.66**	**1068.69**	**1069.06**	**1069.19**	**1071.08**
107	**MW-4P**	**1/29/1988**	**1232.9**	**1235.19**	**95.0**	**10.0**	**1138.3 - 1148.3**	**Perched Water Table**	**1149.04**	**1150.85**	**1151.66**	**1153.37**	**1150.88**	**1151.96**	**1149.32**	**1149.32**	**1148.16**	**1148.92**	**1147.07**	**1146.72**	**1148.30**	**1148.18**	**1148.24**	**1151.19**
109	**MW-5A**	**11/8/1989**	**1224.0**	**1225.81**	**103.3**	**15.0**	**1122.9 - 1137.9**	**Perched Water Table**	**1136.26**	**1136.54**	**1137.88**	**1139.73**	**1137.72**	**1138.27**	**1136.34**	**1135.86**	**1135.52**	**1135.74**	**1134.78**	**1134.27**	**1134.29**	**1135.12**	**1135.58**	**1136.90**
108	**MW-5**	**2/17/1988**	**1223.3**	**1225.32**	**150.6**	**10.0**	**1072.6 - 1082.6**	**Regional Water Table**	**1083.51**	**1083.69**	**1086.30**	**1087.23**	**1085.93**	**1086.23**	**1084.59**	**1084.36**	**1083.94**	**1084.05**	**1081.46**	**1082.51**	**1082.60**	**1083.14**	**1083.50**	**1086.28**
110	**MW-6**	**1/12/1900**	**1233.0**	**1235.37**	**202.2**	**5.0**	**1025.7 - 1030.7**	**Piezometer, Lower Zone**	**1070.54**	**1071.89**	**1073.9**	**1075.63**	**1073.88**	**1073.53**	**1069.39**	**1067.35**	**1065.30**	**1063.84**	**1062.81**	**1062.48**	**1062.35**	**1062.48**	**1062.25**	**1063.27**
111	MW-7	11/7/1989	1255.7	1258.03	234.5	5.0	1023.5 - 1028.5	Piezometer, Lower Zone	1076.09	1077.19	1079.32	1080.77	1079.32	1078.89	1074.92	1072.83	1070.92	1069.39	1069.50	1068.20	1069.34	1074.93	1069.71	1070.14
112	MW-8R	11/13/1989	1256.1	1258.84	202.5	15.0	1056.3 - 1071.3	Piezometer, Upper Zone	1084.56	1084.3	1087.91	1088.96	1087.42	1086.93	1082.78	1079.31	1077.00	1075.30	1076.74	1075.12	1075.04	1075.74	1076.15	1079.52
113	MW-9	8/29/1989	1255.4	1257.50	126.8	15.0	1130.7 - 1145.7	Perched Water Table	1140.24	1140.36	1141.06	1142.21	1140.92	1141.14	1140.16	1139.74	1139.22	1138.73	1139.07	1139.25	1139.35	1139.24	1139.13	1139.79
114	**MW-10**	**9/15/1989**	**1215.6**	**1217.52**	**183.5**	**5.0**	**1034.0 - 1039.0**	**Piezometer, Lower Zone**	**1092.78**	**1092.99**	**1097.75**	**1099.58**	**1098.09**	**1096.89**	**1090.39**	**1086.65**	**1084.18**	**1082.08**	**1083.12**	**1081.66**	**1080.14**	**1082.75**	**1081.73**	**1086.63**
115	**MW-11**	**9/29/1989**	**1216.4**	**1218.56**	**162.5**	**15.0**	**1056.0 - 1071.0**	**Piezometer, Upper Zone**	**1097.89**	**1095.62**	**1102.91**	**1104.98**	**1100.85**	**1102.01**	**1093.69**	**1089.81**	**1089.22**	**1085.59**	**1086.25**	**1086.73**	**1086.75**	**1087.68**	**1090.31**	**1092.04**
116	**MW-12**	**9/22/1989**	**1216.4**	**1218.36**	**98.5**	**15.0**	**1119.9 - 1134.9**	**Perched Water Table**	**1130.62**	**1131.75**	**1132.41**	**1134.17**	**1132.29**	**1132.13**	**1130.62**	**1130.50**	**1129.69**	**1130.45**	**1128.48**	**1130.17**	**1130.87**	**1131.77**	**1133.62**	**1133.71**
117	MW-13P	2/26/2003	1224.5	1227.42	102.4	15.0	1122.1 - 1137.1	Perched Water Table	1134.05	1134.08	1134.44	1134.98	1134.6	1134.56	1134.00	1133.64	1133.46	1132.81	1133.40	1133.40	1133.21	1133.60	1134.40	1134.33
125	**MW-14WT**	**9/20/2022**	**1247.2**	**1249.70**	**106.0**	**15.0**	**1141.2 - 1156.2**	**Perched Water Table**	--	--	--	--	--	--	--	--	--	--	**1141.87**	**1146.01**	**1145.92**	**1146.67**	**1146.77**	**1146.98**
118	**MW-14**	**3/12/2003**	**1247.5**	**1249.69**	**186.1**	**15.0**	**1061.4 - 1076.4**	**Regional Water Table**	**1083.05**	**1082.42**	**1086.86**	**1087.89**	**1086.34**	**1086.00**	**1081.36**	**1077.76**	**1075.24**	**1073.32**	**1073.63**	**1072.80**	**1072.54**	**1073.44**	**1073.91**	**1077.46**
119	**MW-14Z**	**3/7/2003**	**1247.5**	**1250.22**	**210.8**	**5.0**	**1036.7 - 1041.7**	**Piezometer, Lower Zone**	**1080.29**	**1078.48**	**1083.98**	**1082.36**	**1082.78**	**1083.11**	**1078.69**	**1073.19**	**1072.26**	**1071.89**	**1071.20**	**1071.17**	**1071.09**	**1071.30**	**1071.96**	**1072.58**
127	**MW-15WT**	**9/28/2022**	**1220.6**	**1223.24**	**85.0**	**10.0**	**1135.6 - 1145.6**	**Perched Water Table**	--	--	--	--	--	--	--	--	--	--	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**
129	**MW-16WT**	**9/21/2022**	**1184.7**	**1187.41**	**75.0**	**10.0**	**1109.7 - 1119.7**	**Perched Water Table**	--	--	--	--	--	--	--	--	--	--	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**
131	**MW-16**	**8/25/2022**	**1184.3**	**1186.92**	**97.0**	**5.0**	**1087.3 - 1092.3**	**Piezometer/Undefined**	--	--	--	--	--	--	--	--	--	--	**1093.09***	**1101.68**	**1102.48**	**1104.29**	**1104.38**	**1107.62**
133	**MW-17WT**	**9/26/2022**	**1196.4**	**1199.18**	**92.0**	**10.0**	**1104.4 - 1114.4**	**Perched Water Table**	--	--	--	--	--	--	--	--	--	--	**1116.64**	**1117.78**	**FROZEN**	**1121.62**	**1124.88**	**1122.04**

Notes:
NM - Not measured.
-- - Data not available due to monitoring point not yet installed.
* - Groundwater elevation not representative due to well still stablizing post-well development.
BOLD -Monitoring well or piezometer used in monitoring of the proposed landfill expansion area.

Table 6
Analytical Parameters included in Baseline Monitoring
Vernon County Landfill - Proposed Eastern Expansion

Analytical Parameters	MW-14WT	MW-15WT	MW-16WT	MW-16	MW-17WT
Baseline/Detection					
Alkalinity	x	x	x	x	x
Chloride	x	x	x	x	x
Hardness	x	x	x	x	x
Conductivity (field)	x	x	x	x	x
pH (field)	x	x	x	x	x
Temperature (field)	x	x	x	x	x
Public Welfare					
Copper	x	x	x	x	x
Manganese	x	x	x	x	x
Sulfate	x	x	x	x	x
Zinc	x	x	x	x	x
Public Health					
Arsenic	x	x	x	x	x
Barium	x	x	x	x	x
Cadmium	x	x	x	x	x
Chromium	x	x	x	x	x
Flouride	x	x	x	x	x
Lead	x	x	x	x	x
Mercury	x	x	x	x	x
N+N	x	x	x	x	x
Selenium	x	x	x	x	x
Silver	x	x	x	x	x
Boron	x	x	x	x	x
Subtitle D Well Background					
Antimony			x		x
Beryllium			x		x
Cobalt			x		x
Nickel			x		x
Thalium			x		x
Vanadium			x		x
Other					
VOCs (8260)	x	x	x	x	x

Notes:

	- Parameter is not analyzed for.
x	- Parameter is analyzed for.

Table 7
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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-14WT

Analytical Parameters	NR 140 Standards		Well No./Sampling Date MW-14WT					
	PAL	ES	12/22/2022	1/23/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023
VOCs (ug/L)								
1,1,1,2-Tetrachloroethane	7	70	<0.46	<0.46	<0.46	<0.46	--	--
1,1,1-Trichloroethane	40	200	<0.38	<0.38	<0.38	<0.38	--	--
1,1,2,2-Tetrachloroethane	0.02	0.2	<0.40	<0.4	<0.40	<0.4	--	--
1,1,2-Trichloroethane	0.5	5	<0.35	<0.35	<0.35	<0.35	--	--
1,1-Dichloroethane	85	850	<0.41	<0.41	<0.41	<0.41	--	--
1,1-Dichloroethene	0.7	7	<0.39	<0.39	<0.39	<0.39	--	--
1,1-Dichloropropene	NE	NE	<0.30	<0.3	<0.30	<0.3	--	--
1,2,3-Trichlorobenzene	NE	NE	<0.46	<0.46	<0.46	<0.46	--	--
1,2,3-Trichloropropane	12	60	<0.41	<0.41	<0.41	<0.41	--	--
1,2,4-Trichlorobenzene	14	70	<0.34	<0.34	<0.34	<0.34	--	--
1,2,4-Trimethylbenzene	96	480	<0.36	<0.36	<0.36	<0.36	--	--
1,2-Dibromo-3-Chloropropane	0.02	0.2	<2.0	<2	<2.0	<2	--	--
1,2-Dibromoethane (EDB)	0.01	0.05	<0.39	<0.39	<0.39	<0.39	--	--
1,2-Dichlorobenzene	60	600	<0.33	<0.33	<0.33	<0.33	--	--
1,2-Dichloroethane	0.5	5	<0.39	<0.39	<0.39	<0.39	--	--
1,2-Dichloropropane	0.5	5	<0.43	<0.43	<0.43	<0.43	--	--
1,3,5-Trimethylbenzene	96	480	<0.25	<0.25	<0.25	<0.25	--	--
1,3-Dichlorobenzene	120	600	<0.40	<0.4	<0.40	<0.4	--	--
1,3-Dichloropropane	NE	NE	<0.36	<0.36	<0.36	<0.36	--	--
1,4-Dichlorobenzene	15	75	<0.36	<0.36	<0.36	<0.36	--	--
2,2-Dichloropropane	NE	NE	<0.44	<0.44	<0.44	<0.44	--	--
2-Butanone (MEK)	800	4000	--	<2.1	--	<2.1	--	--
2-Chlorotoluene	NE	NE	<0.31	<0.31	<0.31	<0.31	--	--
4-Chlorotoluene	NE	NE	<0.35	<0.35	<0.35	<0.35	--	--
Acetone	1800	9000	--	4.1 JB	--	<1.7	--	--
Benzene	0.5	5	<0.15	<0.15	<0.15	<0.15	--	--
Bromobenzene	NE	NE	<0.36	<0.36	<0.36	<0.36	--	--
Bromochloromethane	NE	NE	<0.43	<0.43	<0.43	<0.43	--	--
Bromodichloromethane	0.06	0.6	<0.37	<0.37	<0.37	<0.37	--	--
Bromoform	0.44	4.4	<0.48	<0.48	<0.48	<0.48	--	--
Bromomethane	1	10	<0.80	<0.8	<0.80	<0.80	--	--
Carbon disulfide	200	1000	--	--	--	<0.45	--	--
Carbon tetrachloride	0.5	5	<0.38	<0.45	<0.38	<0.38	--	--
Chlorobenzene	20	100	<0.39	<0.38	<0.39	<0.39	--	--
Chlorodibromomethane	6	60	<0.49	<0.39	--	--	--	--
Chloroethane	80	400	<0.51	<0.51	<0.51	<0.51	--	--
Chloroform	0.6	6	<0.37	<0.37	<0.37	<0.37	--	--
Chloromethane	3	30	<0.32	<0.32	<0.32	<0.32	--	--
cis-1,2-Dichloroethene	7	70	<0.41	<0.41	<0.41	<0.41	--	--
cis-1,3-Dichloropropene	NE	NE	<0.42	<0.42	<0.42	<0.42	--	--
Dibromochloromethane	6	60	--	<0.49	<0.49	<0.49	--	--
Dibromomethane	NE	NE	<0.27	<0.27	<0.27	<0.27	--	--
Dichlorodifluoromethane	200	1000	<0.67	<0.67	<0.67	<0.67	--	--
Ethylbenzene	140	700	<0.18	<0.18	<0.18	<0.18	--	--
Hexachlorobutadiene	NE	NE	<0.45	<0.45	<0.45	<0.45	--	--
Isopropyl ether	NE	NE	<0.28	<0.28	<0.28	<0.28	--	--
Isopropylbenzene	NE	NE	<0.39	<0.39	<0.39	<0.39	--	--
Methyl tert-butyl ether	12	60	<0.39	<0.39	<0.39	<0.39	--	--
Methylene Chloride	0.5	5	2.1 JB	<1.6	<1.6	<1.6	--	--
Naphthalene	10	100	<0.34	<0.34	<0.34	<0.34	--	--
n-Butylbenzene	NE	NE	<0.39	<0.39	<0.39	<0.39	--	--
N-Propylbenzene	NE	NE	<0.41	<0.41	<0.41	<0.41	--	--
p-Isopropyltoluene	NE	NE	<0.36	<0.36	<0.36	<0.36	--	--
sec-Butylbenzene	NE	NE	<0.40	<0.4	<0.40	<0.4	--	--
Styrene	10	100	<0.39	<0.39	<0.39	<0.39	--	--
tert-Butylbenzene	NE	NE	<0.40	<0.4	<0.40	<0.4	--	--
Tetrachloroethene	0.5	5	<0.37	<0.37	<0.37	<0.37	--	--
Tetrahydrofuran	10	50	--	<1.9	--	<1.9	--	--
Toluene	160	800	<0.15	<0.15	<0.15	<0.15	--	--
trans-1,2-Dichloroethene	20	100	<0.35	<0.35	<0.35	<0.35	--	--
trans-1,3-Dichloropropene	NE	NE	<0.36	<0.36	<0.36	<0.36	--	--
Trichloroethene	0.5	5	<0.16	<0.16	<0.16	<0.16	--	--
Trichlorofluoromethane	698	3490	<0.43	<0.43	<0.43	<0.43	--	--
Vinyl chloride	0.02	0.2	<0.20	<0.2	<0.20	<0.20	--	--
Xylenes, Total	400	2000	<0.22	0.32 JB	<0.22	<0.22	--	--

Table 7
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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-14WT

Analytical Parameters	NR 140 Standards		Well No./Sampling Date MW-14WT					
	PAL	ES	12/22/2022	1/23/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023
Inorganics								
Alkalinity - mg/L	NE	NE	230	211	222	224	235	237
Antimony - ug/L	1.2	6	--	--	<1.3	--	--	--
Arsenic - ug/L	1	10	0.70 J	0.55 J	2.6	1.0	0.44	0.92
Barium - ug/L	400	2000	54	47.5	92.4	47.4	--	--
Beryllium - ug/L	0.4	4	--	--	0.86	--	<0.53	--
Boron - mg/L	0.2	1	--	0.0461 JB	<0.0127	0.0134	--	<0.0127
Cadmium - ug/L	0.5	5	<0.17	<0.17	0.23	<0.17	--	--
Chloride - mg/L	125	250	5	5.6	4.4	4.3	6	4.8
Chromium - ug/L	10	100	<1.1	<1.1	16.5	1.4	<1.1	--
Cobalt - ug/L	8	40	--	--	4.1	--	--	--
Copper - ug/L	130	1300	0.70 J	0.83 JB	14.9	1.3	--	--
Fluoride - mg/L	0.8	4	0.2	0.21	0.24	0.28	0.23	<0.19
Hardness as calcium carbonate - mg/L	NE	NE	240	238	227	234	246	250
Lead - ug/L	1.5	15	<0.19	<0.19	5.1	0.39	<0.19	--
Manganese - ug/L	60	300	**460**	272	**759**	**303**	120	267
Mercury - ug/L	0.2	2	<0.098	<0.079	<0.079	<0.079	--	--
Nickel - ug/L	20	100	--	--	12.1	--	--	--
Nitrate Nitrite as N - mg/L	2	10	0.21	0.25	0.28	0.28	--	--
Selenium - ug/L	10	50	<0.98	<0.98	<0.98	<0.98	--	--
Silver - ug/L	10	50	<0.12	<0.12	<0.12	<0.12	--	--
Sulfate - mg/L	125	250	3.2	3.1	3.2	3.0	4.5	5.0
Titanium - ug/L	NE	NE	--	--	<0.57	--	--	--
Vanadium - ug/L	6	30	--	--	27.8	--	<2.2	--
Zinc - ug/L	250	500	<6.9	<6.9	25.6	<6.9	--	--
Field Parameters								
Elevation, Groundwater - ft above MSL	NE	NE	1141.87	1146.01	1145.92	1146.67	1146.77	1146.98
pH, Field - standard units	NE	NE	8.25	8.23	7.89	8.58	8.25	8.34
Specific Conductance, Field -	NE	NE	440	760	572	409	472	469
Temperature, Water -degree Centigrade	NE	NE	7.4	4.5	8.1	7.6	10.9	14.2

Notes:
NE: No standard established.
-- : Not analyzed.
J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B: Detection is suspect due to blank contamination.
< : Indicates the analyte was analyzed for but not detected above the detection limit.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).

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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-15WT

Analytical Parameters	NR 140 Standards		Well No./Sampling Date MW-15WT					
	PAL	ES	12/22/2022	1/23/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023
VOCs (ug/L)								
1,1,1,2-Tetrachloroethane	7	70	DRY	DRY	DRY	DRY	DRY	DRY
1,1,1-Trichloroethane	40	200	DRY	DRY	DRY	DRY	DRY	DRY
1,1,2,2-Tetrachloroethane	0.02	0.2	DRY	DRY	DRY	DRY	DRY	DRY
1,1,2-Trichloroethane	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
1,1-Dichloroethane	85	850	DRY	DRY	DRY	DRY	DRY	DRY
1,1-Dichloroethene	0.7	7	DRY	DRY	DRY	DRY	DRY	DRY
1,1-Dichloropropene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
1,2,3-Trichlorobenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
1,2,3-Trichloropropane	12	60	DRY	DRY	DRY	DRY	DRY	DRY
1,2,4-Trichlorobenzene	14	70	DRY	DRY	DRY	DRY	DRY	DRY
1,2,4-Trimethylbenzene	96	480	DRY	DRY	DRY	DRY	DRY	DRY
1,2-Dibromo-3-Chloropropane	0.02	0.2	DRY	DRY	DRY	DRY	DRY	DRY
1,2-Dibromoethane (EDB)	0.01	0.05	DRY	DRY	DRY	DRY	DRY	DRY
1,2-Dichlorobenzene	60	600	DRY	DRY	DRY	DRY	DRY	DRY
1,2-Dichloroethane	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
1,2-Dichloropropane	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
1,3,5-Trimethylbenzene	96	480	DRY	DRY	DRY	DRY	DRY	DRY
1,3-Dichlorobenzene	120	600	DRY	DRY	DRY	DRY	DRY	DRY
1,3-Dichloropropane	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
1,4-Dichlorobenzene	15	75	DRY	DRY	DRY	DRY	DRY	DRY
2,2-Dichloropropane	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
2-Chlorotoluene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
4-Chlorotoluene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Benzene	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
Bromobenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Bromochloromethane	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Bromodichloromethane	0.06	0.6	DRY	DRY	DRY	DRY	DRY	DRY
Bromoform	0.44	4.4	DRY	DRY	DRY	DRY	DRY	DRY
Bromomethane	1	10	DRY	DRY	DRY	DRY	DRY	DRY
Carbon tetrachloride	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
Chlorobenzene	20	100	DRY	DRY	DRY	DRY	DRY	DRY
Chlorodibromomethane	6	60	DRY	DRY	DRY	DRY	DRY	DRY
Chloroethane	80	400	DRY	DRY	DRY	DRY	DRY	DRY
Chloroform	0.6	6	DRY	DRY	DRY	DRY	DRY	DRY
Chloromethane	3	30	DRY	DRY	DRY	DRY	DRY	DRY
cis-1,2-Dichloroethene	7	70	DRY	DRY	DRY	DRY	DRY	DRY
cis-1,3-Dichloropropene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Dibromomethane	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Dichlorodifluoromethane	200	1000	DRY	DRY	DRY	DRY	DRY	DRY
Ethylbenzene	140	700	DRY	DRY	DRY	DRY	DRY	DRY
Hexachlorobutadiene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Isopropyl ether	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Isopropylbenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Methyl tert-butyl ether	12	60	DRY	DRY	DRY	DRY	DRY	DRY
Methylene Chloride	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
Naphthalene	10	100	DRY	DRY	DRY	DRY	DRY	DRY
n-Butylbenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
N-Propylbenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
p-Isopropyltoluene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
sec-Butylbenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Styrene	10	100	DRY	DRY	DRY	DRY	DRY	DRY
tert-Butylbenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Tetrachloroethene	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
Toluene	160	800	DRY	DRY	DRY	DRY	DRY	DRY
trans-1,2-Dichloroethene	20	100	DRY	DRY	DRY	DRY	DRY	DRY
trans-1,3-Dichloropropene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Trichloroethene	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
Trichlorofluoromethane	698	3490	DRY	DRY	DRY	DRY	DRY	DRY
Vinyl chloride	0.02	0.2	DRY	DRY	DRY	DRY	DRY	DRY
Xylenes, Total	400	2000	DRY	DRY	DRY	DRY	DRY	DRY

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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-15WT

Analytical Parameters	NR 140 Standards		Well No./Sampling Date MW-15WT					
	PAL	ES	12/22/2022	1/23/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023
Inorganics								
Alkalinity - mg/L	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Antimony - ug/L	1.2	6	DRY	DRY	DRY	DRY	DRY	DRY
Arsenic - ug/L	1	10	DRY	DRY	DRY	DRY	DRY	DRY
Barium - ug/L	400	2000	DRY	DRY	DRY	DRY	DRY	DRY
Beryllium - ug/L	0.4	4	DRY	DRY	DRY	DRY	DRY	DRY
Cadmium - ug/L	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
Chloride - mg/L	125	250	DRY	DRY	DRY	DRY	DRY	DRY
Chromium - ug/L	10	100	DRY	DRY	DRY	DRY	DRY	DRY
Cobalt - ug/L	8	40	DRY	DRY	DRY	DRY	DRY	DRY
Copper - ug/L	130	1300	DRY	DRY	DRY	DRY	DRY	DRY
Fluoride - mg/L	0.8	4	DRY	DRY	DRY	DRY	DRY	DRY
Hardness as calcium carbonate - mg/L	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Lead - ug/L	1.5	15	DRY	DRY	DRY	DRY	DRY	DRY
Manganese - ug/L	60	300	DRY	DRY	DRY	DRY	DRY	DRY
Mercury - ug/L	0.2	2	DRY	DRY	DRY	DRY	DRY	DRY
Nickel - ug/L	20	100	DRY	DRY	DRY	DRY	DRY	DRY
Nitrate Nitrite as N - mg/L	2	10	DRY	DRY	DRY	DRY	DRY	DRY
Selenium - ug/L	10	50	DRY	DRY	DRY	DRY	DRY	DRY
Silver - ug/L	10	50	DRY	DRY	DRY	DRY	DRY	DRY
Sulfate - mg/L	125	250	DRY	DRY	DRY	DRY	DRY	DRY
Titanium - ug/L	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Vanadium - ug/L	6	30	DRY	DRY	DRY	DRY	DRY	DRY
Zinc - ug/L	250	500	DRY	DRY	DRY	DRY	DRY	DRY
Field Parameters								
Elevation, Groundwater - ft above MSL	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
pH, Field - standard units	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Specific Conductance, Field -	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Temperature, Water -degree Centigrade	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY

Notes:
NE: No standard established.
-- : Not analyzed.
J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B: Detection is suspect due to trip blank contamination.
< : Indicates the analyte was analyzed for but not detected above the detection limit.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).

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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-16WT

Analytical Parameters	NR 140 Standards		Well No./Sampling Date MW-16WT					
	PAL	ES	12/22/2022	1/23/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023
VOCs (ug/L)								
1,1,1,2-Tetrachloroethane	7	70	DRY	DRY	DRY	DRY	DRY	DRY
1,1,1-Trichloroethane	40	200	DRY	DRY	DRY	DRY	DRY	DRY
1,1,2,2-Tetrachloroethane	0.02	0.2	DRY	DRY	DRY	DRY	DRY	DRY
1,1,2-Trichloroethane	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
1,1-Dichloroethane	85	850	DRY	DRY	DRY	DRY	DRY	DRY
1,1-Dichloroethene	0.7	7	DRY	DRY	DRY	DRY	DRY	DRY
1,1-Dichloropropene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
1,2,3-Trichlorobenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
1,2,3-Trichloropropane	12	60	DRY	DRY	DRY	DRY	DRY	DRY
1,2,4-Trichlorobenzene	14	70	DRY	DRY	DRY	DRY	DRY	DRY
1,2,4-Trimethylbenzene	96	480	DRY	DRY	DRY	DRY	DRY	DRY
1,2-Dibromo-3-Chloropropane	0.02	0.2	DRY	DRY	DRY	DRY	DRY	DRY
1,2-Dibromoethane (EDB)	0.01	0.05	DRY	DRY	DRY	DRY	DRY	DRY
1,2-Dichlorobenzene	60	600	DRY	DRY	DRY	DRY	DRY	DRY
1,2-Dichloroethane	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
1,2-Dichloropropane	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
1,3,5-Trimethylbenzene	96	480	DRY	DRY	DRY	DRY	DRY	DRY
1,3-Dichlorobenzene	120	600	DRY	DRY	DRY	DRY	DRY	DRY
1,3-Dichloropropane	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
1,4-Dichlorobenzene	15	75	DRY	DRY	DRY	DRY	DRY	DRY
2,2-Dichloropropane	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
2-Chlorotoluene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
4-Chlorotoluene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Benzene	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
Bromobenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Bromochloromethane	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Bromodichloromethane	0.06	0.6	DRY	DRY	DRY	DRY	DRY	DRY
Bromoform	0.44	4.4	DRY	DRY	DRY	DRY	DRY	DRY
Bromomethane	1	10	DRY	DRY	DRY	DRY	DRY	DRY
Carbon tetrachloride	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
Chlorobenzene	20	100	DRY	DRY	DRY	DRY	DRY	DRY
Chlorodibromomethane	6	60	DRY	DRY	DRY	DRY	DRY	DRY
Chloroethane	80	400	DRY	DRY	DRY	DRY	DRY	DRY
Chloroform	0.6	6	DRY	DRY	DRY	DRY	DRY	DRY
Chloromethane	3	30	DRY	DRY	DRY	DRY	DRY	DRY
cis-1,2-Dichloroethene	7	70	DRY	DRY	DRY	DRY	DRY	DRY
cis-1,3-Dichloropropene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Dibromomethane	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Dichlorodifluoromethane	200	1000	DRY	DRY	DRY	DRY	DRY	DRY
Ethylbenzene	140	700	DRY	DRY	DRY	DRY	DRY	DRY
Hexachlorobutadiene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Isopropyl ether	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Isopropylbenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Methyl tert-butyl ether	12	60	DRY	DRY	DRY	DRY	DRY	DRY
Methylene Chloride	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
Naphthalene	10	100	DRY	DRY	DRY	DRY	DRY	DRY
n-Butylbenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
N-Propylbenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
p-Isopropyltoluene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
sec-Butylbenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Styrene	10	100	DRY	DRY	DRY	DRY	DRY	DRY
tert-Butylbenzene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Tetrachloroethene	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
Toluene	160	800	DRY	DRY	DRY	DRY	DRY	DRY
trans-1,2-Dichloroethene	20	100	DRY	DRY	DRY	DRY	DRY	DRY
trans-1,3-Dichloropropene	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Trichloroethene	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
Trichlorofluoromethane	698	3490	DRY	DRY	DRY	DRY	DRY	DRY
Vinyl chloride	0.02	0.2	DRY	DRY	DRY	DRY	DRY	DRY
Xylenes, Total	400	2000	DRY	DRY	DRY	DRY	DRY	DRY

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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-16WT

Analytical Parameters	NR 140 Standards		Well No./Sampling Date MW-16WT					
	PAL	ES	12/22/2022	1/23/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023
Inorganics								
Alkalinity - mg/L	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Antimony - ug/L	1.2	6	DRY	DRY	DRY	DRY	DRY	DRY
Arsenic - ug/L	1	10	DRY	DRY	DRY	DRY	DRY	DRY
Barium - ug/L	400	2000	DRY	DRY	DRY	DRY	DRY	DRY
Beryllium - ug/L	0.4	4	DRY	DRY	DRY	DRY	DRY	DRY
Cadmium - ug/L	0.5	5	DRY	DRY	DRY	DRY	DRY	DRY
Chloride - mg/L	125	250	DRY	DRY	DRY	DRY	DRY	DRY
Chromium - ug/L	10	100	DRY	DRY	DRY	DRY	DRY	DRY
Cobalt - ug/L	8	40	DRY	DRY	DRY	DRY	DRY	DRY
Copper - ug/L	130	1300	DRY	DRY	DRY	DRY	DRY	DRY
Fluoride - mg/L	0.8	4	DRY	DRY	DRY	DRY	DRY	DRY
Hardness as calcium carbonate - mg/L	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Lead - ug/L	1.5	15	DRY	DRY	DRY	DRY	DRY	DRY
Manganese - ug/L	60	300	DRY	DRY	DRY	DRY	DRY	DRY
Mercury - ug/L	0.2	2	DRY	DRY	DRY	DRY	DRY	DRY
Nickel - ug/L	20	100	DRY	DRY	DRY	DRY	DRY	DRY
Nitrate Nitrite as N - mg/L	2	10	DRY	DRY	DRY	DRY	DRY	DRY
Selenium - ug/L	10	50	DRY	DRY	DRY	DRY	DRY	DRY
Silver - ug/L	10	50	DRY	DRY	DRY	DRY	DRY	DRY
Sulfate - mg/L	125	250	DRY	DRY	DRY	DRY	DRY	DRY
Titanium - ug/L	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Vanadium - ug/L	6	30	DRY	DRY	DRY	DRY	DRY	DRY
Zinc - ug/L	250	500	DRY	DRY	DRY	DRY	DRY	DRY
Field Parameters								
Elevation, Groundwater - ft above MSL	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
pH, Field - standard units	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Specific Conductance, Field -	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY
Temperature, Water -degree Centigrade	NE	NE	DRY	DRY	DRY	DRY	DRY	DRY

Notes:
NE: No standard established.
-- : Not analyzed.
J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B: Detection is suspect due to trip blank contamination.
< : Indicates the analyte was analyzed for but not detected above the detection limit.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).

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Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-16

Analytical Parameters	NR 140 Standards		Well No./Sampling Date MW-16					
	PAL	ES	12/22/2022	1/23/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023
VOCs (ug/L)								
1,1,1,2-Tetrachloroethane	7	70	<0.46	<0.46	<0.46	<0.46	--	--
1,1,1-Trichloroethane	40	200	<0.38	<0.38	<0.38	<0.38	--	--
1,1,2,2-Tetrachloroethane	0.02	0.2	<0.40	<0.40	<0.40	<0.40	--	--
1,1,2-Trichloroethane	0.5	5	<0.35	<0.35	<0.35	<0.35	--	--
1,1-Dichloroethane	85	850	<0.41	<0.41	<0.41	<0.41	--	--
1,1-Dichloroethene	0.7	7	<0.39	<0.39	<0.39	<0.39	--	--
1,1-Dichloropropene	NE	NE	<0.30	<0.30	<0.30	<0.30	--	--
1,2,3-Trichlorobenzene	NE	NE	<0.46	<0.46	<0.46	<0.46	--	--
1,2,3-Trichloropropane	12	60	<0.41	<0.41	<0.41	<0.41	--	--
1,2,4-Trichlorobenzene	14	70	<0.34	<0.34	<0.34	<0.34	--	--
1,2,4-Trimethylbenzene	96	480	<0.36	<0.36	<0.36	<0.36	--	--
1,2-Dibromo-3-Chloropropane	0.02	0.2	<2.0	<2.0	<2.0	<2.0	--	--
1,2-Dibromoethane (EDB)	0.01	0.05	<0.39	<0.39	<0.39	<0.39	--	--
1,2-Dichlorobenzene	60	600	<0.33	<0.33	<0.33	<0.33	--	--
1,2-Dichloroethane	0.5	5	<0.39	<0.39	<0.39	<0.39	--	--
1,2-Dichloropropane	0.5	5	<0.43	<0.43	<0.43	<0.43	--	--
1,3,5-Trimethylbenzene	96	480	<0.25	<0.25	<0.25	<0.25	--	--
1,3-Dichlorobenzene	120	600	<0.40	<0.40	<0.40	<0.40	--	--
1,3-Dichloropropane	NE	NE	<0.36	<0.36	<0.36	<0.36	--	--
1,4-Dichlorobenzene	15	75	<0.36	<0.36	<0.36	<0.36	--	--
2,2-Dichloropropane	NE	NE	<0.44	<0.44	<0.44	<0.44	--	--
2-Butanone (MEK)	800	4000	--	<2.1	--	<2.1	--	--
2-Chlorotoluene	NE	NE	<0.31	<0.31	<0.31	<0.31	--	--
4-Chlorotoluene	NE	NE	<0.35	<0.35	<0.35	<0.35	--	--
Acetone	1800	9000	--	<1.7	--	<1.7	--	--
Benzene	0.5	5	<0.15	<0.15	<0.15	<0.15	--	--
Bromobenzene	NE	NE	<0.36	<0.36	<0.36	<0.36	--	--
Bromochloromethane	NE	NE	<0.43	<0.43	<0.43	<0.43	--	--
Bromodichloromethane	0.06	0.6	<0.37	<0.37	<0.37	<0.37	--	--
Bromoform	0.44	4.4	<0.48	<0.48	<0.48	<0.48	--	--
Bromomethane	1	10	<0.80	<0.80	<0.80	<0.80	--	--
Carbon disulfide	200	1000	--	--	--	<0.45	--	--
Carbon tetrachloride	0.5	5	<0.38	<0.38	<0.38	<0.38	--	--
Chlorobenzene	20	100	<0.39	<0.39	<0.39	<0.39	--	--
Chlorodibromomethane	6	60	<0.49	<0.49	--	--	--	--
Chloroethane	80	400	<0.51	<0.51	<0.51	<0.51	--	--
Chloroform	0.6	6	<0.37	<0.37	<0.37	<0.37	--	--
Chloromethane	3	30	<0.32	<0.32	<0.32	<0.32	--	--
cis-1,2-Dichloroethene	7	70	<0.41	<0.41	<0.41	<0.41	--	--
cis-1,3-Dichloropropene	NE	NE	<0.42	<0.42	<0.42	<0.42	--	--
Dibromochloromethane	6	60	--	<0.49	<0.49	<0.49	--	--
Dibromomethane	NE	NE	<0.27	<0.27	<0.27	<0.27	--	--
Dichlorodifluoromethane	200	1000	<0.67	<0.67	<0.67	<0.67	--	--
Ethylbenzene	140	700	<0.18	<0.18	<0.18	<0.18	--	--
Hexachlorobutadiene	NE	NE	<0.45	<0.45	<0.45	<0.45	--	--
Isopropyl ether	NE	NE	<0.28	<0.28	<0.28	<0.28	--	--
Isopropylbenzene	NE	NE	<0.39	<0.39	<0.39	<0.39	--	--
Methyl tert-butyl ether	12	60	<0.39	<0.39	<0.39	<0.39	--	--
Methylene Chloride	0.5	5	2.0 JB	<1.6	<1.6	<1.6	--	--
Naphthalene	10	100	<0.34	<0.34	<0.34	<0.34	--	--
n-Butylbenzene	NE	NE	<0.39	<0.39	<0.39	<0.39	--	--
N-Propylbenzene	NE	NE	<0.41	<0.41	<0.41	<0.41	--	--
p-Isopropyltoluene	NE	NE	<0.36	<0.36	<0.36	<0.36	--	--
sec-Butylbenzene	NE	NE	<0.40	<0.40	<0.40	<0.40	--	--
Styrene	10	100	<0.39	<0.39	<0.39	<0.39	--	--
tert-Butylbenzene	NE	NE	<0.40	<0.40	<0.40	<0.40	--	--
Tetrachloroethene	0.5	5	<0.37	<0.37	<0.37	<0.37	--	--
Tetrahydrofuran	10	50	--	<1.9	--	<1.9	--	--
Toluene	160	800	<0.15	<0.15	<0.15	<0.15	--	--
trans-1,2-Dichloroethene	20	100	<0.35	<0.35	<0.35	<0.35	--	--
trans-1,3-Dichloropropene	NE	NE	<0.36	<0.36	<0.36	<0.36	--	--
Trichloroethene	0.5	5	<0.16	<0.16	<0.16	<0.16	--	--
Trichlorofluoromethane	698	3490	<0.43	<0.43	<0.43	<0.43	--	--
Vinyl chloride	0.02	0.2	<0.20	<0.20	<0.20	<0.20	--	--
Xylenes, Total	400	2000	<0.22	<0.22	<0.22	<0.22	--	--

Table 7
Page 8 of 10
Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-16

Analytical Parameters	NR 140 Standards		Well No./Sampling Date MW-16					
	PAL	ES	12/22/2022	1/23/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023
Inorganics								
Alkalinity - mg/L	NE	NE	390	357	381	376	349	362
Antimony - ug/L	1.2	6	--	--	<1.3	--	--	--
Arsenic - ug/L	1	10	0.31 J	<0.23	<0.23	0.61	--	--
Barium - ug/L	400	2000	70	66.6	63.3	61	--	--
Beryllium - ug/L	0.4	4	--	--	<0.53	--	--	--
Boron - mg/L	0.2	1	--	0.045 JB	0.0131	0.0192	--	<0.0127
Cadmium - ug/L	0.5	5	<0.17	<0.17	<0.17	<0.17	--	--
Chloride - mg/L	125	250	7.2	7.1	5.1	5.9	4.2	3.3
Chromium - ug/L	10	100	<1.1	<1.1	<1.1	<1.1	--	--
Cobalt - ug/L	8	40	--	--	<0.40	--	--	--
Copper - ug/L	130	1300	0.74 J	1.5 JB	1.1	2.6	--	--
Fluoride - mg/L	0.8	4	0.2	0.18 J	0.22	0.27	0.2	<0.19
Hardness as calcium carbonate - mg/L	NE	NE	380	399	386	355	383	366
Lead - ug/L	1.5	15	<0.19	<0.19	<0.19	<0.19	--	--
Manganese - ug/L	60	300	6.1	4.4	3.8	5.3	--	--
Mercury - ug/L	0.2	2	<0.098	<0.079	<0.079	<0.079	--	--
Nickel - ug/L	20	100	--	--	<0.63	--	--	--
Nitrate Nitrite as N - mg/L	2	10	0.9	1.1	1.0	0.67	--	--
Selenium - ug/L	10	50	<0.98	<0.98	<0.98	<0.98	--	--
Silver - ug/L	10	50	<0.12	<0.12	<0.12	<0.12	--	--
Sulfate - mg/L	125	250	16	17.7	15.6	14	10.3	10.2
Titanium - ug/L	NE	NE	--	--	<0.57	--	--	--
Vanadium - ug/L	6	30	--	--	<2.2	--	--	--
Zinc - ug/L	250	500	<6.9	<6.9	<6.9	<6.9	--	--
Field Parameters								
Elevation, Groundwater - ft above MSL	NE	NE	1093.09	1101.68	1102.48	1104.29	1104.38	1107.62
pH, Field - standard units	NE	NE	8.14	8.41	7.83	8.11	7.95	8.08
Specific Conductance, Field -	NE	NE	551	560	767	700	649	665
Temperature, Water -degree Centigrade	NE	NE	7.2	0.0	8.9	10.2	11.0	12.8

Notes:
NE: No standard established.
-- : Not analyzed.
J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B: Detection is suspect due to trip blank contamination.
< : Indicates the analyte was analyzed for but not detected above the detection limit.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).

Table 7
Page 9 of 10
Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-17WT

Analytical Parameters	NR 140 Standards		Well No./Sampling Date MW-17WT					
	PAL	ES	12/22/2022	1/23/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023
VOCs (ug/L)								
1,1,1,2-Tetrachloroethane	7	70	<0.46	<0.46	FROZEN	<0.46	<0.46	--
1,1,1-Trichloroethane	40	200	<0.38	<0.38	FROZEN	<0.38	<0.38	--
1,1,2,2-Tetrachloroethane	0.02	0.2	<0.40	<0.40	FROZEN	<0.40	<0.40	--
1,1,2-Trichloroethane	0.5	5	<0.35	<0.35	FROZEN	<0.35	<0.35	--
1,1-Dichloroethane	85	850	<0.41	<0.41	FROZEN	<0.41	<0.41	--
1,1-Dichloroethene	0.7	7	<0.39	<0.39	FROZEN	<0.39	<0.39	--
1,1-Dichloropropene	NE	NE	<0.30	<0.30	FROZEN	<0.30	<0.30	--
1,2,3-Trichlorobenzene	NE	NE	<0.46	<0.46	FROZEN	<0.46	<0.46	--
1,2,3-Trichloropropane	12	60	<0.41	<0.41	FROZEN	<0.41	<0.41	--
1,2,4-Trichlorobenzene	14	70	<0.34	<0.34	FROZEN	<0.34	<0.34	--
1,2,4-Trimethylbenzene	96	480	<0.36	<0.36	FROZEN	<0.36	<0.36	--
1,2-Dibromo-3-Chloropropane	0.02	0.2	<2.0	<2.0	FROZEN	<2.0	<2.0	--
1,2-Dibromoethane (EDB)	0.01	0.05	<0.39	<0.39	FROZEN	<0.39	<0.39	--
1,2-Dichlorobenzene	60	600	<0.33	<0.33	FROZEN	<0.33	<0.33	--
1,2-Dichloroethane	0.5	5	<0.39	<0.39	FROZEN	<0.39	<0.39	--
1,2-Dichloropropane	0.5	5	<0.43	<0.43	FROZEN	<0.43	<0.43	--
1,3,5-Trimethylbenzene	96	480	<0.25	<0.25	FROZEN	<0.25	<0.25	--
1,3-Dichlorobenzene	120	600	<0.40	<0.40	FROZEN	<0.40	<0.40	--
1,3-Dichloropropane	NE	NE	<0.36	<0.36	FROZEN	<0.36	<0.36	--
1,4-Dichlorobenzene	15	75	<0.36	<0.36	FROZEN	<0.36	<0.36	--
2,2-Dichloropropane	NE	NE	<0.44	<0.44	FROZEN	<0.44	<0.44	--
2-Butanone (MEK)	800	4000	--	<2.1	FROZEN	<2.1	<2.1	--
2-Chlorotoluene	NE	NE	<0.31	<0.31	FROZEN	<0.31	<0.31	--
4-Chlorotoluene	NE	NE	<0.35	<0.35	FROZEN	<0.35	<0.35	--
Acetone	1800	9000	--	<1.7	FROZEN	<1.7	8 B	--
Benzene	0.5	5	<0.15	<0.15	FROZEN	<0.15	<0.15	--
Bromobenzene	NE	NE	<0.36	<0.36	FROZEN	<0.36	<0.36	--
Bromochloromethane	NE	NE	<0.43	<0.43	FROZEN	<0.43	<0.43	--
Bromodichloromethane	0.06	0.6	<0.37	<0.37	FROZEN	<0.37	<0.37	--
Bromoform	0.44	4.4	<0.48	<0.48	FROZEN	<0.48	<0.48	--
Bromomethane	1	10	<0.80	<0.80	FROZEN	<0.80	<0.80	--
Carbon disulfide	200	1000	--	--	FROZEN	<0.45	<0.45	--
Carbon tetrachloride	0.5	5	<0.38	<0.38	FROZEN	<0.38	<0.38	--
Chlorobenzene	20	100	<0.39	<0.39	FROZEN	<0.39	<0.39	--
Chlorodibromomethane	6	60	<0.49	<0.49	FROZEN	<0.49	--	--
Chloroethane	80	400	<0.51	<0.51	FROZEN	<0.51	<0.51	--
Chloroform	0.6	6	<0.37	<0.37	FROZEN	<0.37	<0.37	--
Chloromethane	3	30	<0.32	<0.32	FROZEN	<0.32	<0.32	--
cis-1,2-Dichloroethene	7	70	<0.41	<0.41	FROZEN	<0.41	<0.41	--
cis-1,3-Dichloropropene	NE	NE	<0.42	<0.42	FROZEN	<0.42	<0.42	--
Dibromochloromethane	6	60	--	<0.49	FROZEN	<0.49	<0.49	--
Dibromomethane	NE	NE	<0.27	<0.27	FROZEN	<0.27	<0.27	--
Dichlorodifluoromethane	200	1000	<0.67	<0.67	FROZEN	<0.67	<0.67	--
Ethylbenzene	140	700	<0.18	<0.18	FROZEN	<0.18	<0.18	--
Hexachlorobutadiene	NE	NE	<0.45	<0.45	FROZEN	<0.45	<0.45	--
Isopropyl ether	NE	NE	<0.28	<0.28	FROZEN	<0.28	<0.28	--
Isopropylbenzene	NE	NE	<0.39	<0.39	FROZEN	<0.39	<0.39	--
Methyl tert-butyl ether	12	60	<0.39	<0.39	FROZEN	<0.39	<0.39	--
Methylene Chloride	0.5	5	2.4 JB	<1.6	FROZEN	<1.6	<1.6	--
Naphthalene	10	100	<0.34	<0.34	FROZEN	<0.34	<0.34	--
n-Butylbenzene	NE	NE	<0.39	<0.39	FROZEN	<0.39	<0.39	--
N-Propylbenzene	NE	NE	<0.41	<0.41	FROZEN	<0.41	<0.41	--
p-Isopropyltoluene	NE	NE	<0.36	<0.36	FROZEN	<0.36	<0.36	--
sec-Butylbenzene	NE	NE	<0.40	<0.40	FROZEN	<0.40	<0.40	--
Styrene	10	100	<0.39	<0.39	FROZEN	<0.39	<0.39	--
tert-Butylbenzene	NE	NE	<0.40	<0.40	FROZEN	<0.40	<0.40	--
Tetrachloroethene	0.5	5	<0.37	<0.37	FROZEN	<0.37	<0.37	--
Tetrahydrofuran	10	50	--	<1.9	FROZEN	<1.9	<1.9	--
Toluene	160	800	<0.15	<0.15	FROZEN	<0.15	<0.15	--
trans-1,2-Dichloroethene	20	100	<0.35	<0.35	FROZEN	<0.35	<0.35	--
trans-1,3-Dichloropropene	NE	NE	<0.36	<0.36	FROZEN	<0.36	<0.36	--
Trichloroethene	0.5	5	<0.16	<0.16	FROZEN	<0.16	<0.16	--
Trichlorofluoromethane	698	3490	<0.43	<0.43	FROZEN	<0.43	<0.43	--
Vinyl chloride	0.02	0.2	<0.20	<0.20	FROZEN	<0.20	<0.20	--
Xylenes, Total	400	2000	<0.22	<0.22	FROZEN	<0.22	<0.22	--

Table 7
Page 10 of 10
Baseline Groundwater Analytical Results Summary
Vernon County Landfill - Proposed Eastern Expansion
Monitoring Well: MW-17WT

Analytical Parameters	NR 140 Standards		Well No./Sampling Date MW-17WT					
	PAL	ES	12/22/2022	1/23/2023	3/1/2023	3/27/2023	4/28/2023	5/30/2023
Inorganics								
Alkalinity - mg/L	NE	NE	280	352	FROZEN	265	269	260
Antimony - ug/L	1.2	6	<1.3	<1.3	FROZEN	<1.3	<1.3	--
Arsenic - ug/L	1	10	0.52 J	<0.23	FROZEN	0.5	0.49	--
Barium - ug/L	400	2000	40	69.4	FROZEN	32.8	33	--
Beryllium - ug/L	0.4	4	<0.53	<0.53	FROZEN	<0.53	<0.53	--
Boron - mg/L	0.2	1	--	0.0478 JB	FROZEN	0.019	<0.0127	<0.0127
Cadmium - ug/L	0.5	5	<0.17	<0.17	FROZEN	<0.17	<0.17	--
Chloride - mg/L	125	250	7.7	6.3	FROZEN	4.5	4.5	3.4
Chromium - ug/L	10	100	<1.1	<1.1	FROZEN	<1.1	<1.1	--
Cobalt - ug/L	8	40	<0.40	<0.40	FROZEN	<0.40	<0.40	--
Copper - ug/L	130	1300	<0.50	1.2 JB	FROZEN	0.62	1.6	--
Fluoride - mg/L	0.8	4	0.21	0.18 J	FROZEN	0.27	0.22	<0.19
Hardness as calcium carbonate - mg/L	NE	NE	290	391	FROZEN	270	267	266
Lead - ug/L	1.5	15	<0.19	0.39 J	FROZEN	<0.19	<0.19	--
Manganese - ug/L	60	300	53	4.5	FROZEN	12.2	28.4	--
Mercury - ug/L	0.2	2	<0.098	0.45 B	FROZEN	<0.079	<0.079	--
Nickel - ug/L	20	100	1.2 J	<0.63	FROZEN	0.73	1.4	--
Nitrate Nitrite as N - mg/L	2	10	0.18	1.1	FROZEN	0.2	0.2	--
Selenium - ug/L	10	50	<0.98	<0.98	FROZEN	<0.98	<0.98	--
Silver - ug/L	10	50	<0.12	<0.12	FROZEN	<0.12	<0.12	--
Sulfate - mg/L	125	250	7.2	15.6	FROZEN	5.4	5.8	5.3
Thallium - ug/L	0.4	2	--	<0.57	FROZEN	<0.57	<0.57	<0.57
Titanium - ug/L	NE	NE	<1.8	--	FROZEN	<0.57	--	--
Vanadium - ug/L	6	30	<2.2	<2.2	FROZEN	<2.2	<2.2	--
Zinc - ug/L	250	500	<6.9	<6.9	FROZEN	<6.9	<6.9	--
Field Parameters								
Elevation, Groundwater - ft above MSL	NE	NE	1116.64	1117.78	FROZEN	1121.62	1124.88	1122.04
pH, Field - standard units	NE	NE	8.26	8.24	FROZEN	8.49	7.52	7.64
Specific Conductance, Field -	NE	NE	650	670	FROZEN	546	518	529
Temperature, Water -degree Centigrade	NE	NE	7.5	3.3	FROZEN	7.6	10.5	14.3

Notes:
NE: No standard established.
-- : Not analyzed.
J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B: Detection is suspect due to trip blank contamination.
< : Indicates the analyte was analyzed for but not detected above the detection limit.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).

Attachment A

2022 Soil Boring Logs

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	B-18

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/19/2022	9/19/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,239.0 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 164,513 N, 715,479 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	24		0	LEAN CLAY (CL), brown to gray, moist, some sand, medium plasticity, mottled (Residuum)						20	38	19	84	1% Gravel, 15% Sand
2 SS	18 / 7	2 3 4	1.5							27	64	40	86	0% Gravel, 14% Sand
3 SS	18 / 8	2 3 3	3.0		CL					27	51	32	64	0% Gravel, 37% Sand
4 SS	18 / 14	3 7 8	4.5							10				
5 SS	18 / 14	3 7 9	6.0							15	39	24	41	0% Gravel, 59% Sand
6 SS	18 / 16	6 6 5	7.5	CLAYEY SAND (SC), brown to gray, moist, fine to medium grained, slightly cohesive (Residuum)	SC					27	72	49	70.5	0% Gravel, 30% Sand
7 SS	18 / 16	5 8 8	9.0	CLAYEY SAND (SC), orangish brown, moist, fine grained, slightly cohesive (Residuum)	SC					20				
8 SS	18 / 12	3 3 12	10.5							16				
9	18	14	12.0											
			13.5	LEAN CLAY (CL), dark brown to dark reddish brown, moist, little sand, medium plasticity, light brown sandy transition (Residuum)	CL									
			15.0											
			16.5											
			18.0	WEATHERED SANDY DOLOSTONE, light brown, moist, fine grained, with fine to medium gravel, some clay (Saprolite)										
			19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
Aaron Kutz	Short Elliott Hendrickson Inc.	Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-18 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	14	12 10	21.0	WEATHERED SANDY DOLOSTONE, light brown, moist, fine grained, with fine to medium gravel, some clay (Saprolite) *(continued)*										
			22.5	NOTE: larger pieces of dolostone bedrock from 20 to 25 feet.										
			24.0											
10 SS	24 5	50+	25.5											
			27.0											
			28.5											
11 SS	12 1	50+	30.0	No Recovery Boring Terminated at 30 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	B-19

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/19/2022	9/19/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,233.3 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 164,380 N, 715,477 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	24		0	LEAN CLAY (CL), brown to gray, moist, little fine sand, medium plasticity (Residuum or Fill)							50	33	75	0% Gravel, 26% Sand
2 SS	18 / 10	4 7 4	1.5 / 3.0		CL					16	52	33	54	24% Gravel, 23% Sand
3 SS	18 / 10	2 3 2	4.5 / 6.0	LEAN CLAY (CL), brown to gray, moist, with sand, low to medium plasticity (Residuum)						44				
4 SS	18 / 12	4 2 2	7.5 / 9.0	NOTE: sand seam from 7 to 7.5 feet, fine to medium grained.	CL					53				
5 SS	18 / 14	2 2 2	10.5 / 12.0							54				
6 SS	18 / 6	1 2 1	13.5	NOTE: gravel from 12.5 to 13.5 feet of weathered bedrock.						33				
7 SS	18 / 8	1 1 1	15.0 / 16.5	FAT CLAY (CH), brown, moist, little sand and gravel, high plasticity, soft (Residuum)	CH					40				
8 SS	18 / 14	1 1 2	18.0 / 19.5							57	105	71	97	0% Gravel, 3% Sand
9	18	0								57				

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: / Fax:
Aaron Kutz	Short Elliott Hendrickson Inc.	

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SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-19 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	6	1 5	21.0	WEATHERED SANDY DOLOSTONE, light brown to gray, moist, silt with sand and gravel, loose (Saprolite).										
			22.5											
			24.0											
10 SS	18 4	50+	25.5											
			27.0											
11 SS	18 1	50+		Boring Terminated at 28 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	B-20

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/19/2022	9/19/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,215.8 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 164,064 N, 715,518 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	24		0	LEAN CLAY (CL), reddish brown, moist, with gravel, some sand, medium plasticity, medium stiff (Residuum)							58	42	65	0% Gravel, 35% Sand
2 SS	18 / 12	10 4 5	1.5							19				
3 SS	18 / 12	3 4 6	3.0		CL					27				
4 SS	18 / 12	2 3 6	4.5	NOTE: decreased gravel content						33				
5 SS	18 / 12	2 12 11	6.0	SANDY LEAN CLAY (CL), brown, moist, low plasticity (Residuum)						15				
6 SS	18 / 12	3 4 5	7.5		CL					30				
7 SS	18 / 14	2 1 2	9.0	LEAN CLAY (CL), dark brown to brown, moist, little sand, low to medium plasticity (Residuum)						46				
8 SS	18 / 16	5 4 4	10.5	NOTE: blue to green colored seam at 15 feet. NOTE: increased sand content between 17 to 17.5 feet.	CL					39				
9	18	4	12.0											
			13.5											
			15.0											
			16.5											
			18.0											
			19.5											

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SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-20 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	16	7 12	21.0	WEATHERED SANDSTONE, poorly graded sand to silty sand, brown, moist to dry, fine grained (Saprolite).	CL									
			22.5											
			24.0											
10 SS	18 3	50+	25.5											
			27.0											
11 SS	18 10	14 18 50+	28.5											
			30.0	Boring Terminated at 30 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	B-21

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/19/2022	9/19/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,226.1 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 163,857 N, 715,398 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	24		0	LEAN CLAY (CL), brown, moist, medium to high plasticity, medium stiff (Fill)							67	48	75	0% Gravel, 25% Sand
			1.5											
2 SS	18 / 8	2 2 3	3.0							24	50	34	76	0% Gravel, 25% Sand
					CL									
3 SS	18 / 8	1 1 2	4.5							25				
			6.0											
4 SS	18 / 12	1 4 8	7.5							19				
				NOTE: trace to little gravel at 7.5 feet.										
			9.0	LEAN CLAY TO SILT (CL-ML), grayish brown, moist, low plasticity, medium stiff, trace roots/organics through 21 feet (Fill)										
5 SS	18 / 12	3 6 7	10.5							17	36	18	86	3% Gravel, 12% Sand
6 SS	18 / 14	3 7 8	12.0							19	36	14	86	0% Gravel, 6% Sand
			13.5		CL-ML									
7 SS	18 / 10	2 3 5	15.0							20				
			16.5											
8 SS	18 / 14	4 6 9	18.0							18	36	18	88	0% Gravel, 12% Sand
9	18	5	19.5							19	40	21	95	0% Gravel,

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SOIL BORING LOG INFORMATION SUPPLEMENT
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Boring Number B-21 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
SS	12	5 7	21.0	LEAN CLAY TO SILT (CL-ML), grayish brown, moist, low plasticity, medium stiff, trace roots/organics through 21 feet (Fill) *(continued)*										5% Sand
			22.5											
			24.0											
10 SS	18 12	4 7 8	25.5		CL-ML					19				
			27.0											
			28.5											
11 SS	18 18		30.0							18	33	13	99	0% Gravel, 1% Sand
				Boring Terminated at 31 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	MW-14WT

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	8/29/2022	9/20/2022	hsa,mud rotary,coring

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
WC334	125	MW-14WT	1,152.8 Feet MSL	1,247.2 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 164,748 N, 715,687 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	24		0	LEAN CLAY WITH SAND (CL), brown to light brown, moist, medium plasticity, mottled (Residuum)										
			1.5											
2 SS	18 18	3 6 7	3.0		CL									
			4.5											
3 SS	18 18	4 7 7	6.0	FAT CLAY WITH SAND (CH), light brown, moist, little gravel, stiff (Residuum)										
4 SS	18 18	4 3 6	7.5	NOTE: Mottled below 7 feet bgs.	CH					37	64	42	68	0% Gravel, 32% Sand
			9.0											
5 SS	18 6	3 6 11	10.5											
			12.0											
6 SS	18 16	3 4 8	13.5	SANDY LEAN CLAY (CL), brown, moist, trace gravel, mottled (Residuum) NOTE: Light brown sand layer <1" thick at 13.5 feet bgs.	CL									
7 SS	18 16	3 5 6	15.0	FAT CLAY (CH), brown to reddish brown, moist, little sand, stiff (Residuum) NOTE: Light brown sand layer <1" thick at 15 feet bgs.	CH									
			16.5											
8 SS	18 18	14 12 8	18.0											
9	18	6	19.5											

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Signature	Firm	Tel:
Ben Kerkt	Short Elliott Hendrickson Inc.	Fax:

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Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-14WT Use only as an attachment to Form 4400-122.

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	18	8 12	21.0	FAT CLAY (CH), brown to reddish brown, moist, little sand, stiff (Residuum) *(continued)*										
			22.5		CH									
			24.0											
10 SS	18 18	4 9 11	25.5											
			27.0	SANDY LEAN CLAY (CL), brown, moist, stiff	CL									
11	6		28.5											Permeability = 3.1E-08 cm/sec
SH 12 SS 13 SS	6 10 2 0 0	6 50+ 50+	30.0	DOLOSTONE, fractured, hard drilling from 28.5 to 33.5 feet, switched to mud rotary at 33.5 feet No recovery										
			31.5											
			33.0											
14 SS	0 0	50+	34.5											
			36.0											
15 RC	55.2 2.125		37.5	DOLOSTONE, light brown to buff, fine grained, <5mm vugs throughout, no bedding, slightly decomposed, trace mineralization, iron oxide staining, void from 37.0 to 39.0 feet, switched to mud rotary at 41.5 feet										Poor RQD (10%)
			39.0											
			40.5											
			42.0											
			43.5											
16 SS	0 0	50+	45.0	No recovery, void from 48.0 to 49.0 feet										
			46.5											
			48.0											
17 SS	5 4	50+	49.5	SAND, light brown, poorly graded, fine to coarse										
			51.0											
18	96		52.5											Poor RQD

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Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-14WT Use only as an attachment to Form 4400-122. Page 3 of 4

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
RC	39		54.0	DOLOSTONE, gray to brown, fine grained, 5 to 10mm vugs throughout with mineralization, chert at approximately 53.0 feet, very fractured, difficult coring. *(continued)*										(19.5%)
			55.5											
			57.0											
			58.5											
			60.0											
			61.5	End of coring at 60.5 feet due to formation too difficult to core.										
			63.0											
			64.5											
			66.0											
			67.5											
			69.0											
			70.5											
			72.0											
			73.5											
			75.0											
			76.5											
			78.0											
			79.5											
			81.0											
			82.5											
			84.0											
			85.5											

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SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-14WT Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			87.0	End of coring at 60.5 feet due to formation too difficult to core. *(continued)*										
			88.5											
			90.0											
			91.5											
			93.0											
			94.5	NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 94.4 feet bgs on 9/19/2022.										
			96.0											
			97.5											
			99.0											
			100.5											
			102.0											
			103.5											
			105.0											
			106.5											
			108.0											
				Boring Terminated at 109 feet.										

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Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	MW-15WT

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/26/2022	9/27/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
WC335	127	MW-15WT	1,136.4 Feet MSL	1,220.6 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 164,382 N, 715,726 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	24		0	SILTY SAND (SM), dark brown, moist, fine grained, trace organics (Topsoil)	SM									
			1.5	LEAN CLAY WITH SAND (CL), brown to dark brown, moist, with silt, low plasticity (Residuum)										
2 SS	18 / 14	5 6 7	3.0		CL									
3 SS	18 / 4	6 5 6	4.5											
			6.0											
4 SS	18 / 16	5 4 5	7.5	CLAYEY SAND (SC), reddish brown, moist, fine to medium grained, trace gravel (Residuum)	SC									
			9.0	LEAN CLAY WITH SAND (CL), light brown to to brown, moist, medium plasticity, stratified with light gray to red fat clay (CH) lenses < 1cm thick (Residuum) NOTE Occasional sand layers throughout sample 5. NOTE: Sample 6 highly disturbed due to gravel.										
5 SS	18 / 14	6 6 22	10.5		CL									
6 SS	18 / 14	3 4 5	12.0											
			13.5											
7 SS	18 / 16	3 3 4	15.0	FAT CLAY (CH), brown to reddish brown, moist, high plasticity, mottled, with sand (Residuum)										
			16.5											
8 SS	18 / 18	2 4 4	18.0	NOTE: Started mud rotary drilling after sample 8.	CH					46	109	73	97	0% Gravel, 3% Sand
9	18	2	19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Short Elliott Hendrickson Inc.	Fax:

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SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-15WT Use only as an attachment to Form 4400-122. Page 2 of 4

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	16	4 6	21.0	NOTE: Occasional clayey sand (SC) layers throughout sample 9. FAT CLAY (CH), brown to reddish brown, moist, high plasticity, mottled, with sand (Residuum) *(continued)*										
			22.5											
			24.0											
10 SS	18 18	2 4 9	25.5											
			27.0											
			28.5											
11 SS	18 16	9 8 4	30.0		CH									
			31.5											
			33.0											
12 SS	18 14	2 1 1	34.5											
			36.0											
			37.5											
			39.0											
13 SS	16 12	38 17 50	40.5	WEATHERED SANDSTONE, light brown fine grained, moderately cemented, highly to completely weathered (Saprolite).										
			42.0											
			43.5											
14 SS	14 16	10 15 50	45.0	NOTE: poorly cemented with occasional silt layers throughout sample 14.										
			46.5											
			48.0											
15 SS	13 12	15 45 50	49.5											
			51.0											
			52.5											

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SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-15WT Use only as an attachment to Form 4400-122.

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
16 SS	18 14	32 27 24	54.0	WEATHERED SANDSTONE, light brown fine grained, moderately cemented, highly to completely weathered (Saprolite). *(continued)*										
			55.5											
			57.0											
			58.5											
			60.0											
			61.5											
			63.0											
17 SS	18 14	6 5 10	64.5											
			66.0											
			67.5											
			69.0											
18 SS	2 1	50	70.5	SANDY DOLOSTONE, light brown, moderately weathered to fresh.										
			72.0											
			73.5											
			75.0											
			76.5											
			78.0											
			79.5											
			81.0											
			82.5											
			84.0	NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 84.2 feet bgs on 9/28/2022.										
			85.5											

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SOIL BORING LOG INFORMATION SUPPLEMENT
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Boring Number MW-15WT Use only as an attachment to Form 4400-122. Page 4 of 4

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			87.0	SANDY DOLOSTONE, light brown, moderately weathered to fresh. *(continued)*										
			88.5											
			90.0											
			91.5											
			93.0											
			94.5											
			96.0											
			97.5											
			99.0	Boring Terminated at 99 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	MW-16

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	8/22/2022	8/26/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
WC337	131	MW-16	1,103.9 Feet MSL	1,184.3 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 163,931 N, 715,671 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CU	24 -		1.5	LEAN CLAY WITH SAND (CL), brown, moist, low plasticity, occasional fine roots (Fill)										
2 SS	18 0	2 2 2	3.0											
3 SS	18 10	1 1 2	4.5											
			6.0		CL									
4 ST	24 -		7.5								43	21		
			9.0											
5 ST	24 -		10.5							24	37	16	96	0% Gravel, 4% Sand, Permeability = 3.1E-08 cm/sec
			12.0											
6 SS	18 14	2 3 3	13.5	LEAN CLAY WITH SAND (CL), brown to light brown, moist, low to medium plasticity, mottled (Residuum)										
7 SS	18 14	8 7 6	15.0	NOTE: Trace gravel below 15 feet bgs.	CL									
			16.5											
8 SS	18 18	4 4 6	18.0											
					CL									
9	18	4	19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [signature] Firm Short Elliott Hendrickson Inc. Tel: Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-16 Use only as an attachment to Form 4400-122.

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	18	5 6	21.0	LEAN TO FAT CLAY (CL-CH), brown to light brown, moist, medium to high plasticity, mottled, occasional clayey sand (SC) layers less than 1" thick throughout (Residuum) *(continued)*										
			22.5											
			24.0											
10 SS	18 14	4 4 5	25.5	NOTE: Occasional weathered sandstone layering at 25 to 26 feet bgs.						18	41	24	38	0% Gravel, 62% Sand
			27.0		CL									
			28.5											
11 SS	18 8	8 7 5	30.0	NOTE: Sample 11 - All Sluff.										
			31.5											
			33.0											
			34.5											
12 SS	18 8	22 28 30	36.0	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, with sand layers throughout (Saprolite) NOTE: Sample 12 - All Sluff.										
			37.5											
			39.0											
13 MC	18 -	6 15 42	40.5											
			42.0											
			43.5											
14 SS	18 16	5 8 16	45.0	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, little gravel, with sand layers throughout (Saprolite)										
			46.5											
			48.0											
15 SS	18 16	8 10 26	49.5											
			51.0											
			52.5	NOTE: Switched to mud rotary after sample 15.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-16 Use only as an attachment to Form 4400-122. Page 3 of 4

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
16 SS	5 4	50	54.0	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, little gravel, with sand layers throughout (Saprolite) *(continued)*										
			55.5											
			57.0											
			58.5											
17 SS	9 8	15 50	60.0											
			61.5											
			63.0											
18 SS	18 18	35 8 3	64.5	WEATHERED SHALE, brown, moist, highly to completely weathered, little gravel (Saprolite)										
			66.0											
			67.5											
			69.0											
19 SS	3 3	50	70.5	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, little gravel, with sand layers throughout (Saprolite) NOTE: Borehole lost water at 70 feet to termination.										
			72.0											
			73.5											
20 SS	18 18	3 9 25	75.0	NOTE: 6" layer of weathered shale at 75 feet bgs.										
			76.5											
			78.0											
21 SS	1 1	50	79.5	SANDY DOLOSTONE, brown to light brown, moist, fresh to moderately weathered NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 80.4 feet bgs on 8/26/2022.										
			81.0											
			82.5											
			84.0											
22 SS	1 1	50	85.5											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-16 Use only as an attachment to Form 4400-122.

Sample										Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			87.0	SANDY DOLOSTONE, brown to light brown, moist, fresh to moderately weathered *(continued)*										
			88.5											
23 SS	4 2	50	90.0											
			91.5											
			93.0											
24 SS	1 1	50	94.5											
			96.0											
			97.5											
				Boring Terminated at 98 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	MW-16WT

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/20/2022	9/21/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
WC336	129	MW-16WT	1,116.3 Feet MSL	1,184.7 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 163,940 N, 715,674 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1.5	See MW-16 for description.										
			3.0											
			4.5											
			6.0											
			7.5											
			9.0											
			10.5											
			12.0											
			13.5											
			15.0											
			16.5											
			18.0											
			19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Short Elliott Hendrickson Inc.	Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-16WT Use only as an attachment to Form 4400-122.

Sample										Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			21.0	See MW-16 for description. *(continued)*										
			22.5											
			24.0											
			25.5											
			27.0											
			28.5											
			30.0											
			31.5											
			33.0											
			34.5											
			36.0											
			37.5											
			39.0											
			40.5											
			42.0											
			43.5											
			45.0											
			46.5											
			48.0											
			49.5											
			51.0											
			52.5											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-16WT Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			54.0	See MW-16 for description. *(continued)*										
			55.5											
			57.0											
			58.5											
			60.0											
			61.5											
			63.0											
			64.5											
			66.0											
			67.5											
			69.0	NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 68.4 feet bgs on 8/24/2022.										
			70.5											
			72.0											
			73.5											
			75.0											
				Boring Terminated at 76 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	MW-17WT

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/21/2022	9/23/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
WC338	133	MW-17WT	1,116.5 Feet MSL	1,196.4 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 163,691 N, 715,688 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	18		0	LEAN CLAY WITH SAND (CL), brown (Residuum)	CL									
			1.5											
2 SS	18 18	5 9 6	3.0	CLAYEY SAND (SC), brown, rock fragments at 4.5 to 6 and 7 to 8.5 feet bgs, poorly graded sand seam (1 inch) at 8.4 feet, rough drilling from 7.5 to 8 feet bgs (Residuum).										
3 SS	18 12	10 28 20	4.5 6.0		SC					20	59	40	43	13% Gravel, 45% Sand
4 SS	18 18	14 10 12	7.5 9.0							17	39	27	43	9% Gravel, 48% Sand
5 SS	18 18	10 10 10	10.5							16	41	29	48	0% Gravel, 52% Sand
				WEATHERED SANDSTONE, light brown, very friable, iron oxide staining (Saprolite).										
6 SS	18 18	14 14 25	12.0 13.5											
7 SS	18 18	24 24 40	15.0 16.5											
8 SS	18 18	15 9 10	18.0											
9 ☒	18	7	19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
Ben Kerkstra	Short Elliott Hendrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-17WT Use only as an attachment to Form 4400-122.

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	18	14 34	21.0	WEATHERED SANDSTONE, light brown, very friable, iron oxide staining (Saprolite). *(continued)*										
			22.5											
			24.0											
10 SS	18 18	12 14 16	25.5											
			27.0											
			28.5											
11 SS	18 14	4 5 11	30.0											
			31.5											
			33.0											
			34.5	WEATHERED SANDSTONE, Dark brown, very friable, iron oxide staining (Saprolite).										
12 SS	18 16	10 15 32	36.0	WEATHERED SANDSTONE, brown to dark brown, clayey, very friable (Saprolite).										
			37.5											
			39.0											
13 SS	18 14	8 6 6	40.5											
			42.0											
			43.5											
14 SS	18 8	35 50+	45.0											
			46.5											
			48.0											
15 SS	18 8	10 10 17	49.5											
			51.0											
			52.5											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-17WT Use only as an attachment to Form 4400-122. Page 3 of 4

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			54.0	WEATHERED SANDSTONE, brown to dark brown, clayey, very friable (Saprolite). *(continued)*										
16 SS	18 18	10 14 16	55.5											
			57.0											
			58.5											
17 SS	18 8	14 10 10	60.0											
			61.5											
			63.0											
18 SS	18 1	50+	64.5											
			66.0	SANDSTONE, brown to dark brown, clayey, very friable.										
			67.5											
			69.0											
			70.5											
			72.0											
			73.5											
			75.0											
			76.5											
			78.0											
			79.5	NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 79.9 feet bgs on 9/26/2022.										
			81.0											
			82.5											
			84.0											
			85.5											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-17WT Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			87.0	SANDSTONE, brown to dark brown, clayey, very friable. *(continued)*										
			88.5											
			90.0											
			91.5											
			93.0	Boring Terminated at 93 feet.										

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Attachment B

2022 Abandonment Forms

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

[X] **Verification Only of Fill and Seal**

Route to DNR Bureau:
[ ] Drinking Water [ ] Watershed/Wastewater [ ] Remediation/Redevelopment
[X] Waste Management [ ] Other:

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Vernon	B-18	NA

Latitude / Longitude (see instructions)	Format Code	Method Code
164513 N 715479 W	[X] DD [ ] DDM	[ ] GPS008 [ ] SCR002 [ ] OTH001

¼ / ¼	¼	Section	Township	Range
or Gov't Lot #			N	[ ] E [ ] W

Well Street Address: NA

Well City, Village or Town	Well ZIP Code
NA	NA

Subdivision Name	Lot #
NA	NA

Reason for Removal from Service	WI Unique Well # of Replacement Well
NA	NA

3. Filled & Sealed Well / Drillhole / Borehole Information

[ ] Monitoring Well
[ ] Water Well
[X] Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 09/19/2022

If a Well Construction Report is available, please attach.

Construction Type:
[X] Drilled [ ] Driven (Sandpoint) [ ] Dug
[ ] Other (specify):

Formation Type:
[X] Unconsolidated Formation [X] Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
31	NA

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
3.25	NA

Was well annular space grouted? [X] Yes [ ] No [ ] Unknown

If yes, to what depth (feet)?	Depth to Water (feet)
31	NA

2. Facility / Owner Information

Facility Name: Vernon County Solid Waste Facility

Facility ID (FID or PWS): NA

License/Permit/Monitoring #: NA

Original Well Owner: Vernon County Solid Waste Facility

Present Well Owner: Vernon County Solid Waste Facility

Mailing Address of Present Owner: S3705 County Road LF

City of Present Owner	State	ZIP Code
Viroqua	WI	54665

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	[ ] Yes	[ ] No	[X] N/A
Liner(s) removed?	[ ] Yes	[ ] No	[X] N/A
Liner(s) perforated?	[ ] Yes	[ ] No	[X] N/A
Screen removed?	[ ] Yes	[ ] No	[X] N/A
Casing left in place?	[ ] Yes	[ ] No	[X] N/A
Was casing cut off below surface?	[ ] Yes	[ ] No	[X] N/A
Did sealing material rise to surface?	[ ] Yes	[ ] No	[X] N/A
Did material settle after 24 hours?	[ ] Yes	[X] No	[ ] N/A
If yes, was hole retopped?	[ ] Yes	[ ] No	[X] N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	[X] Yes	[ ] No	[ ] N/A

Required Method of Placing Sealing Material
[ ] Conductor Pipe-Gravity [ ] Conductor Pipe-Pumped
[X] Screened & Poured (Bentonite Chips) [ ] Other (Explain):

Sealing Materials
[ ] Neat Cement Grout [ ] Concrete
[ ] Sand-Cement (Concrete) Grout [X] Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
[X] Bentonite Chips [ ] Bentonite - Cement Grout
[ ] Granular Bentonite [ ] Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	31	Unk.	NA

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Braun Intertec		09/19/2022

Street or Route	Telephone Number
2309 Palace Street	(608) 781-7277

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
La Crosse	WI	54603		5/11/23

DNR Use Only

Date Received	Noted By

Comments:

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

[X] **Verification Only of Fill and Seal**

Route to DNR Bureau:
[ ] Drinking Water [ ] Watershed/Wastewater [ ] Remediation/Redevelopment
[X] Waste Management [ ] Other: _____

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Vernon	B-19	NA

Latitude / Longitude (see instructions)	Format Code	Method Code
164380 N	[X] DD	[ ] GPS008
715477 W	[ ] DDM	[ ] SCR002
		[ ] OTH001

¼ / ¼	¼	Section	Township	Range
or Gov't Lot #			N	[ ] E [ ] W

Well Street Address: NA

Well City, Village or Town	Well ZIP Code
NA	NA

Subdivision Name	Lot #
NA	NA

Reason for Removal from Service	WI Unique Well # of Replacement Well
NA	NA

2. Facility / Owner Information

Facility Name: Vernon County Solid Waste Facility

Facility ID (FID or PWS): NA

License/Permit/Monitoring #: NA

Original Well Owner: Vernon County Solid Waste Facility

Present Well Owner: Vernon County Solid Waste Facility

Mailing Address of Present Owner: S3705 County Road LF

City of Present Owner	State	ZIP Code
Viroqua	WI	54665

3. Filled & Sealed Well / Drillhole / Borehole Information

[ ] Monitoring Well
[ ] Water Well
[X] Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 09/19/2022

If a Well Construction Report is available, please attach.

Construction Type:
[X] Drilled [ ] Driven (Sandpoint) [ ] Dug
[ ] Other (specify): _____

Formation Type:
[X] Unconsolidated Formation [X] Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
31	NA

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
3.25	NA

Was well annular space grouted? [X] Yes [ ] No [ ] Unknown

If yes, to what depth (feet)?	Depth to Water (feet)
31	NA

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	[ ] Yes	[ ] No	[X] N/A
Liner(s) removed?	[ ] Yes	[ ] No	[X] N/A
Liner(s) perforated?	[ ] Yes	[ ] No	[X] N/A
Screen removed?	[ ] Yes	[ ] No	[X] N/A
Casing left in place?	[ ] Yes	[ ] No	[X] N/A
Was casing cut off below surface?	[ ] Yes	[ ] No	[X] N/A
Did sealing material rise to surface?	[ ] Yes	[ ] No	[X] N/A
Did material settle after 24 hours?	[ ] Yes	[X] No	[ ] N/A
If yes, was hole retopped?	[ ] Yes	[ ] No	[X] N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	[X] Yes	[ ] No	[ ] N/A

Required Method of Placing Sealing Material
[ ] Conductor Pipe-Gravity [ ] Conductor Pipe-Pumped
[X] Screened & Poured (Bentonite Chips) [ ] Other (Explain): _____

Sealing Materials
[ ] Neat Cement Grout [ ] Concrete
[ ] Sand-Cement (Concrete) Grout [X] Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
[X] Bentonite Chips [ ] Bentonite - Cement Grout
[ ] Granular Bentonite [ ] Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	31	Unk.	NA

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Braun Intertec		09/19/2022

Street or Route	Telephone Number
2309 Palace Street	(608) 781-7277

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
La Crosse	WI	54603		5/11/23

DNR Use Only

Date Received	Noted By

Comments:

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

[X] **Verification Only of Fill and Seal**

Route to DNR Bureau:
[ ] Drinking Water [ ] Watershed/Wastewater [ ] Remediation/Redevelopment
[X] Waste Management [ ] Other:

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Vernon	B-20	NA

Latitude / Longitude (see instructions)	Format Code	Method Code
164064 N 715518 W	[X] DD [ ] DDM	[ ] GPS008 [ ] SCR002 [ ] OTH001

¼ / ¼	¼	Section	Township	Range
or Gov't Lot #			N	[ ] E [ ] W

Well Street Address: NA

Well City, Village or Town	Well ZIP Code
NA	NA

Subdivision Name	Lot #
NA	NA

Reason for Removal from Service	WI Unique Well # of Replacement Well
NA	NA

2. Facility / Owner Information

Facility Name: Vernon County Solid Waste Facility

Facility ID (FID or PWS): NA

License/Permit/Monitoring #: NA

Original Well Owner: Vernon County Solid Waste Facility

Present Well Owner: Vernon County Solid Waste Facility

Mailing Address of Present Owner: S3705 County Road LF

City of Present Owner	State	ZIP Code
Viroqua	WI	54665

3. Filled & Sealed Well / Drillhole / Borehole Information

[ ] Monitoring Well
[ ] Water Well
[X] Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 09/19/2022

If a Well Construction Report is available, please attach.

Construction Type:
[X] Drilled [ ] Driven (Sandpoint) [ ] Dug
[ ] Other (specify):

Formation Type:
[X] Unconsolidated Formation [X] Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
31	NA

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
3.25	NA

Was well annular space grouted? [X] Yes [ ] No [ ] Unknown

If yes, to what depth (feet)?	Depth to Water (feet)
31	NA

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	[ ] Yes	[ ] No	[X] N/A
Liner(s) removed?	[ ] Yes	[ ] No	[X] N/A
Liner(s) perforated?	[ ] Yes	[ ] No	[X] N/A
Screen removed?	[ ] Yes	[ ] No	[X] N/A
Casing left in place?	[ ] Yes	[ ] No	[X] N/A
Was casing cut off below surface?	[ ] Yes	[ ] No	[X] N/A
Did sealing material rise to surface?	[ ] Yes	[ ] No	[X] N/A
Did material settle after 24 hours?	[ ] Yes	[X] No	[ ] N/A
If yes, was hole retopped?	[ ] Yes	[ ] No	[X] N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	[X] Yes	[ ] No	[ ] N/A

Required Method of Placing Sealing Material
[ ] Conductor Pipe-Gravity [ ] Conductor Pipe-Pumped
[X] Screened & Poured (Bentonite Chips) [ ] Other (Explain):

Sealing Materials
[ ] Neat Cement Grout [ ] Concrete
[ ] Sand-Cement (Concrete) Grout [X] Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
[X] Bentonite Chips [ ] Bentonite - Cement Grout
[ ] Granular Bentonite [ ] Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	31	Unk.	NA

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Braun Intertec		09/19/2022

Street or Route	Telephone Number
2309 Palace Street	(608) 781 7277

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
La Crosse	WI	54603		5/11/23

DNR Use Only

Date Received	Noted By

Comments:

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

[X] **Verification Only of Fill and Seal**

Route to DNR Bureau:
[ ] Drinking Water [ ] Watershed/Wastewater [ ] Remediation/Redevelopment
[X] Waste Management [ ] Other:

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Vernon	B-21	NA

Latitude / Longitude (see instructions)	Format Code	Method Code
163857 N 715398 W	[X] DD [ ] DDM	[ ] GPS008 [ ] SCR002 [ ] OTH001

¼ / ¼	¼	Section	Township	Range
or Gov't Lot #			N	[ ] E [ ] W

Well Street Address: NA

Well City, Village or Town	Well ZIP Code
NA	NA

Subdivision Name	Lot #
NA	NA

Reason for Removal from Service	WI Unique Well # of Replacement Well
NA	NA

2. Facility / Owner Information

Facility Name: Vernon County Solid Waste Facility

Facility ID (FID or PWS): NA

License/Permit/Monitoring #: NA

Original Well Owner: Vernon County Solid Waste Facility

Present Well Owner: Vernon County Solid Waste Facility

Mailing Address of Present Owner: S3705 County Road LF

City of Present Owner	State	ZIP Code
Viroqua	WI	54665

3. Filled & Sealed Well / Drillhole / Borehole Information

[ ] Monitoring Well
[ ] Water Well
[X] Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 09/19/2022

If a Well Construction Report is available, please attach.

Construction Type:
[X] Drilled [ ] Driven (Sandpoint) [ ] Dug
[ ] Other (specify):

Formation Type:
[X] Unconsolidated Formation [X] Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
31	NA

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
3.25	NA

Was well annular space grouted? [X] Yes [ ] No [ ] Unknown

If yes, to what depth (feet)?	Depth to Water (feet)
31	NA

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	[ ] Yes	[ ] No	[X] N/A
Liner(s) removed?	[ ] Yes	[ ] No	[X] N/A
Liner(s) perforated?	[ ] Yes	[ ] No	[X] N/A
Screen removed?	[ ] Yes	[ ] No	[X] N/A
Casing left in place?	[ ] Yes	[ ] No	[X] N/A
Was casing cut off below surface?	[ ] Yes	[ ] No	[X] N/A
Did sealing material rise to surface?	[ ] Yes	[ ] No	[X] N/A
Did material settle after 24 hours?	[ ] Yes	[X] No	[ ] N/A
If yes, was hole retopped?	[ ] Yes	[ ] No	[X] N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	[X] Yes	[ ] No	[ ] N/A

Required Method of Placing Sealing Material
[ ] Conductor Pipe-Gravity [ ] Conductor Pipe-Pumped
[X] Screened & Poured (Bentonite Chips) [ ] Other (Explain):

Sealing Materials
[ ] Neat Cement Grout [ ] Concrete
[ ] Sand-Cement (Concrete) Grout [X] Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
[X] Bentonite Chips [ ] Bentonite - Cement Grout
[ ] Granular Bentonite [ ] Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	31	Unk.	NA

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Braun Intertec		09/19/2022

Street or Route	Telephone Number
2309 Palace Street	(608) 781 7277

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
La Crosse	WI	54603		5/11/23

DNR Use Only

Date Received	Noted By

Comments:

Attachment C

2022 Well Construction Logs

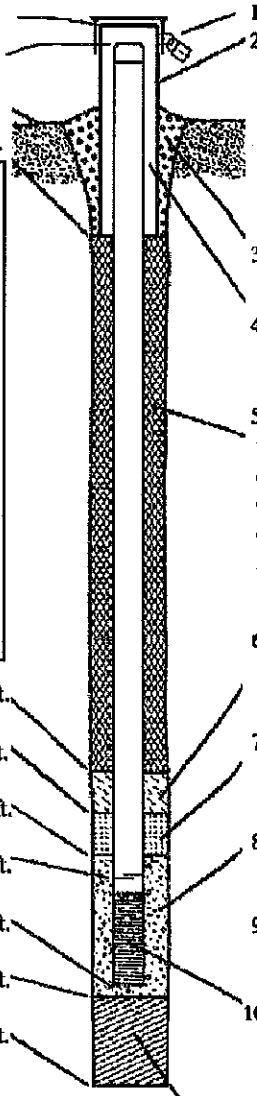
State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other ☐

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Vernon County Solid Waste Facility	Local Grid Location of Well: 164748 ft. ☒ N. ☐ S. 715687 ft. ☒ E. ☐ W.	Well Name: MW-14WT
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: WC334 / DNR Well ID No.
Facility ID	St. Plane ft. N, ft. E. S/C/N	Date Well Installed: 09/20/2022 (mm/dd/yyyy)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: 1/4 of 1/4 of Sec, T. N, R. ☐ E ☐ W	Well Installed By: Name (first, last) and Firm: Ethan Rislov / Braun Intertec
Distance from Waste/Source ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number



A. Protective pipe, top elevation 1249.7 ft. MSL

B. Well casing, top elevation 1249.7 ft. MSL

C. Land surface elevation 1247.15 ft. MSL

D. Surface seal, bottom 1245 ft. MSL or 2 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐

15. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☒ 03 / None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe

17. Source of water (attach analysis, if required): City of Viroqua Municipal

E. Bentonite seal, top ft. MSL or 85 ft.

F. Fine sand, top ft. MSL or 86 ft.

G. Filter pack, top ft. MSL or 88 ft.

H. Screen joint, top ft. MSL or 91 ft.

I. Well bottom ft. MSL or 106 ft.

J. Filter pack, bottom ft. MSL or 109 ft.

K. Borehole, bottom ft. MSL or 109 ft.

L. Borehole, diameter 0006 in.

M. O.D. well casing 2.375 in.

N. I.D. well casing 1.939 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 006 in.
b. Length: 005 ft.
c. Material: Steel ☒ 04 / Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bumper Posts

3. Surface seal: Bentonite ☐ 30 / Concrete ☒ 01 / Other ☐
NA

4. Material between well casing and protective pipe: Bentonite ☒ 30 / Other ☐
NA

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 20 % Bentonite . . . . . Bentonite-cement grout ☒ 50
e. ____ Ft³ volume added for any of the above
f. How installed: Tremie ☒ 01 / Tremie pumped ☐ 02 / Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32
c. NA Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. #15 sand
b. Volume added 1 ft³

8. Filter pack material: Manufacturer, product name & mesh size
a. #40 sand
b. Volume added 4 ft³

9. Well casing: Flush threaded PVC schedule 40 ☐ 23 / Flush threaded PVC schedule 80 ☒ 24 / Other ☐

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐
NA
b. Manufacturer NA
c. Slot size: 0.010 in.
d. Slotted length: 0015 ft.

11. Backfill material (below filter pack): None ☒ 14 / Other ☐
NA

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
	Braun Intertec

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Vernon County Solid Waste Facility	Local Grid Location of Well: 164382 ft. ☒ N. ☐ S. 715726 ft. ☒ E. ☐ W.	Well Name: MW-15WT
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: WC335 DNR Well ID No.:
Facility ID	St. Plane ft. N, ft. E. S/C/N	Date Well Installed: 09/20/2022 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: 1/4 of 1/4 of Sec, T. N, R. ☐ E ☐ W	Well Installed By: Name (first, last) and Firm: Ethan Rislov; Braun Intertec
Distance from Waste/Source ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number

A. Protective pipe, top elevation 1223.38 ft. MSL

B. Well casing, top elevation 1223.24 ft. MSL

C. Land surface elevation 1220.61 ft. MSL

D. Surface seal, bottom 1218 ft. MSL or 2 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ ____

15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☒ 03; None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required):
City of Viroqua Municipal

E. Bentonite seal, top ____ ft. MSL or 68 ft.

F. Fine sand, top ____ ft. MSL or 69 ft.

G. Filter pack, top ____ ft. MSL or 70 ft.

H. Screen joint, top ____ ft. MSL or 75 ft.

I. Well bottom ____ ft. MSL or 85 ft.

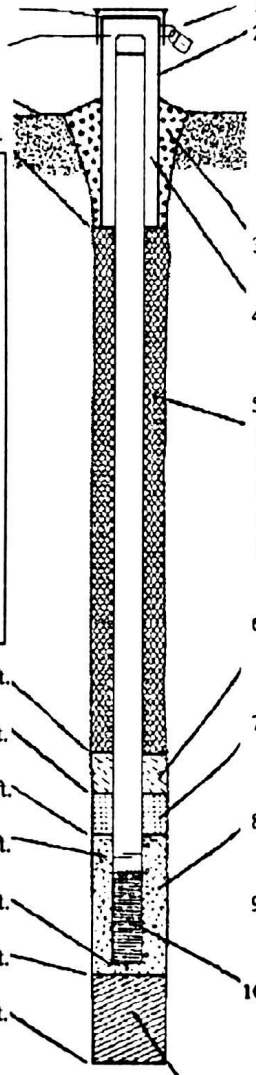
J. Filter pack, bottom ____ ft. MSL or 98 ft.

K. Borehole, bottom ____ ft. MSL or 99 ft.

L. Borehole, diameter 0006 in.

M. O.D. well casing 2.375 in.

N. I.D. well casing 2.047 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 006 in.
b. Length: 005 ft.
c. Material: Steel ☒ 04; Other ☐ ____
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bumper Posts

3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ ____
NA

4. Material between well casing and protective pipe: Bentonite ☒ 30; Other ☐ ____
NA

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 20 % Bentonite . . . . . Bentonite-cement grout ☒ 50
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☒ 01; Tremie pumped ☐ 02; Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32
c. NA Other ☐ ____

7. Fine sand material: Manufacturer, product name & mesh size
a. #15 sand
b. Volume added 1 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. #40 sand
b. Volume added 4.5 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ ____

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ____
NA
b. Manufacturer NA
c. Slot size: 0.010 in.
d. Slotted length: 0010 ft.

11. Backfill material (below filter pack): None ☒ 14; Other ☐ ____
NA

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: _____ Firm: Braun Intertec

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name Vernon County Solid Waste Facility	**Local Grid Location of Well** ☒ N. ☐ S. 163940 ft. 715674 ft. ☒ E. ☐ W.	**Well Name** MW-16WT
Facility License, Permit or Monitoring No.	**Local Grid Origin** ☐ (estimated: ☐) or **Well Location** ☐ Lat. ° ' " Long. ° ' " or	**Wis. Unique Well No.** WC336
Facility ID	**St. Plane** _____ ft. N, _____ ft. E. S/C/N	**DNR Well ID No.**
Type of Well Well Code 12 / PZ	**Section Location of Waste/Source** _____ 1/4 of _____ 1/4 of Sec. _____, T. _____ N, R. _____ ☐ E. ☐ W.	**Date Well Installed** 09/20/2022 (m m d d y y y y)
Distance from Waste/Source _____ ft. **Enf. Stds. Apply** ☐	**Location of Well Relative to Waste/Source** u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	**Gov. Lot Number**
		Well Installed By: Name (first, last) and Firm Ethan Rislov Braun Intertec

A. Protective pipe, top elevation 1187.51 ft. MSL

B. Well casing, top elevation 1187.41 ft. MSL

C. Land surface elevation 1184.70 ft. MSL

D. Surface seal, bottom 1182 ft. MSL or 2 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50
Hollow Stem Auger ☒ 41
Other ☐ _____

15. Drilling fluid used: Water ☒ 02 Air ☐ 01
Drilling Mud ☒ 03 None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis, if required):
City of Viroqua Municipal

E. Bentonite seal, top _____ ft. MSL or 58 ft.

F. Fine sand, top _____ ft. MSL or 59.5 ft.

G. Filter pack, top _____ ft. MSL or 64.5 ft.

H. Screen joint, top _____ ft. MSL or 65 ft.

I. Well bottom _____ ft. MSL or 75 ft.

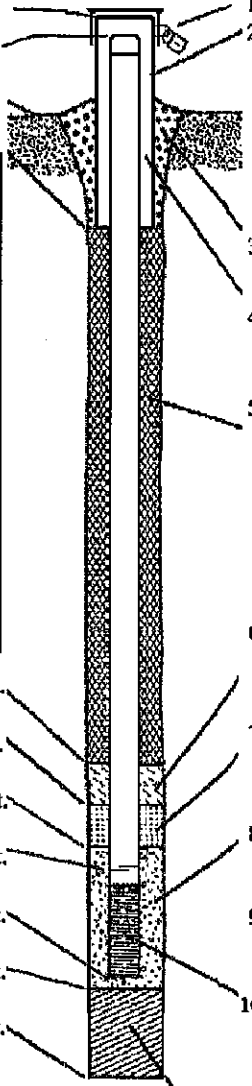
J. Filter pack, bottom _____ ft. MSL or 75 ft.

K. Borehole, bottom _____ ft. MSL or 76 ft.

L. Borehole, diameter 0006 in.

M. O.D. well casing 2.375 in.

N. I.D. well casing 2.047 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 006 in.
b. Length: 005 ft.
c. Material: Steel ☒ 04
Other ☐ _____
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bumper Posts

3. Surface seal: Bentonite ☐ 30
Concrete ☒ 01
NA Other ☐ _____

4. Material between well casing and protective pipe:
Bentonite ☒ 30
NA Other ☐ _____

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 20 % Bentonite . . . . . Bentonite-cement grout ☒ 50
e. _____ Ft^3 volume added for any of the above
f. How installed: Tremie ☒ 01
Tremie pumped ☐ 02
Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32
c. NA Other ☐ _____

7. Fine sand material: Manufacturer, product name & mesh size
a. #15 sand
b. Volume added 1 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. #40 sand
b. Volume added 2 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23
Flush threaded PVC schedule 80 ☐ 24
Other ☐ _____

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
NA Other ☐ _____
b. Manufacturer NA
c. Slot size: 0.010 in.
d. Slotted length: 0005 ft.

11. Backfill material (below filter pack): None ☒ 14
NA Other ☐ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm Braun Intertec

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name Vernon County Solid Waste Facility	**Local Grid Location of Well** 163930 ft. ☒ N. ☐ S. 715670 ft. ☒ E. ☐ W.	**Well Name** MW-16
Facility License, Permit or Monitoring No.	**Local Grid Origin** ☐ (estimated: ☐) or **Well Location** ☐ Lat. ° ' " Long. ° ' " or	**Wis. Unique Well No.** WC337 **DNR Well ID No.**
Facility ID	St. Plane _____ ft. N, _____ ft. E. S/C/N	**Date Well Installed** 09/20/2022 (m m / d d / y y y y)
Type of Well Well Code 12 / PZ	**Section Location of Waste/Source** _____ 1/4 of _____ 1/4 of Sec, _____ T. _____ N, R. _____ ☐ E ☐ W	**Well Installed By: Name (first, last) and Firm** Ethan Rislov Braun Intertec
Distance from Waste/ Source _____ ft. **Enf. Stds. Apply** ☐	**Location of Well Relative to Waste/Source** u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	**Gov. Lot Number**

A. Protective pipe, top elevation 1186.95 ft. MSL

B. Well casing, top elevation 1186.92 ft. MSL

C. Land surface elevation 1184.27 ft. MSL

D. Surface seal, bottom 1182 ft. MSL or 2 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50
Hollow Stem Auger ☒ 41
Other ☐

15. Drilling fluid used: Water ☒ 02 Air ☐ 01
Drilling Mud ☒ 03 None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis, if required):
City of Viroqua Municipal

E. Bentonite seal, top _____ ft. MSL or 78 ft.

F. Fine sand, top _____ ft. MSL or 86.5 ft.

G. Filter pack, top _____ ft. MSL or 89 ft.

H. Screen joint, top _____ ft. MSL or 92 ft.

I. Well bottom _____ ft. MSL or 97 ft.

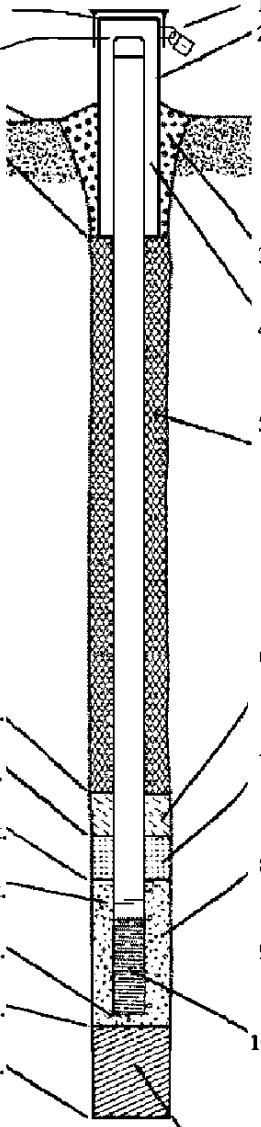
J. Filter pack, bottom _____ ft. MSL or 98 ft.

K. Borehole, bottom _____ ft. MSL or 98 ft.

L. Borehole, diameter 0006 in.

M. O.D. well casing 2.375 in.

N. I.D. well casing 2.047 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 006 in.
b. Length: 005 ft.
c. Material: Steel ☒ 04
Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bumper Posts

3. Surface seal: Bentonite ☐ 30
Concrete ☒ 01
NA Other ☐

4. Material between well casing and protective pipe:
Bentonite ☒ 30
NA Other ☐

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 20 % Bentonite . . . . . Bentonite-cement grout ☒ 50
e. _____ Ft^3 volume added for any of the above
f. How installed: Tremie ☒ 01
Tremie pumped ☐ 02
Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☒3/8 in. ☐1/2 in. Bentonite chips ☒ 32
c. NA Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. #15 sand
b. Volume added 1 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. #40 sand
b. Volume added 2 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23
Flush threaded PVC schedule 80 ☐ 24
Other ☐

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
NA Other ☐
b. Manufacturer NA
c. Slot size: 0.010 in.
d. Slotted length: 0005 ft.

11. Backfill material (below filter pack): None ☒ 14
NA Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Alex Boecher May 21 2023 9:16 PM	Firm
		Braun Intertec

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Vernon County Solid Waste Facility

Local Grid Location of Well: 163091 ft. ☒ N ☐ S, 715688 ft. ☒ E. ☐ W.

Well Name: MW-17WT

Facility License, Permit or Monitoring No.

Local Grid Origin ☐ (estimated: ☐) or Well Location ☐
Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or

Wis. Unique Well No.: WC338

DNR Well ID No.:

Facility ID

St. Plane _____ ft. N, _____ ft. E. S/C/N

Date Well Installed: 09/20/2022 (m m d d y y y y)

Type of Well
Well Code 11 / MW

Section Location of Waste/Source
_____ 1/4 of _____ 1/4 of Sec. _____, T. _____ N, R. _____ ☐ E ☐ W

Well Installed By: Name (first, last) and Firm
Ethan Rislov
Braun Intertec

Distance from Waste/Source _____ ft.

Enf. Stds. Apply ☐

Location of Well Relative to Waste/Source
u ☐ Upgradient s ☐ Sidegradient
d ☐ Downgradient n ☐ Not Known

Gov. Lot Number

A. Protective pipe, top elevation 1199.24 ft. MSL

B. Well casing, top elevation 1199.18 ft. MSL

C. Land surface elevation 1196.43 ft. MSL

D. Surface seal, bottom 1194 ft. MSL or 2 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50
Hollow Stem Auger ☒ 41
Other ☐ ___
_____

15. Drilling fluid used: Water ☒ 02 Air ☐ 01
Drilling Mud ☒ 03 None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis, if required):
City of Viroqua Municipal

E. Bentonite seal, top _____ ft. MSL or 68 ft.

F. Fine sand, top _____ ft. MSL or 71 ft.

G. Filter pack, top _____ ft. MSL or 75 ft.

H. Screen joint, top _____ ft. MSL or 77 ft.

I. Well bottom _____ ft. MSL or 87 ft.

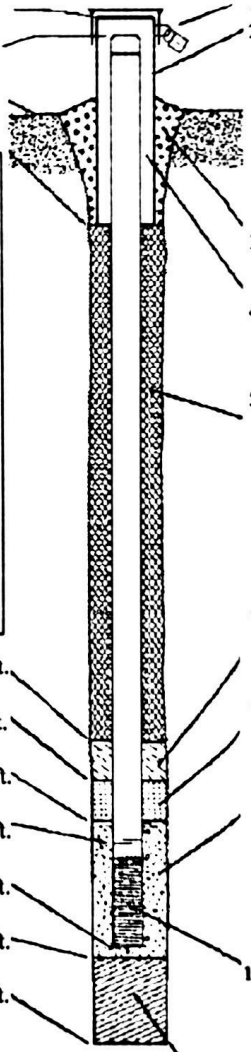
J. Filter pack, bottom _____ ft. MSL or 92 ft.

K. Borehole, bottom _____ ft. MSL or 93 ft.

L. Borehole, diameter 0006 in.

M. O.D. well casing 2.375 in.

N. I.D. well casing 2.047 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 006 in.
b. Length: 005 ft.
c. Material: Steel ☒ 04
Other ☐ ___
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bumper Posts

3. Surface seal: Bentonite ☐ 30
Concrete ☒ 01
NA Other ☐ ___

4. Material between well casing and protective pipe:
Bentonite ☒ 30
NA Other ☐ ___

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 20 % Bentonite . . . . . Bentonite-cement grout ☒ 50
e. ___ Ft³ volume added for any of the above
f. How installed: Tremie ☒ 01
Tremie pumped ☐ 02
Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☒3/8 in. ☐1/2 in. Bentonite chips ☒ 32
c. NA Other ☐ ___

7. Fine sand material: Manufacturer, product name & mesh size
a. #15 sand
b. Volume added 1 ft³

8. Filter pack material: Manufacturer, product name & mesh size
a. #40 sand
b. Volume added 4 ft³

9. Well casing: Flush threaded PVC schedule 40 ☒ 23
Flush threaded PVC schedule 80 ☐ 24
_____ Other ☐ ___

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
NA Other ☐ ___
b. Manufacturer NA
c. Slot size: 0.010 in.
d. Slotted length: 0010 ft.

11. Backfill material (below filter pack): None ☒ 14
NA Other ☐ ___

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm Braun Intertec

Please complete both Form 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

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Attachment D

2022 Well Development Forms

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Vernon County Landfill	Vernon	MW-14WT

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
3268	62	WC334	125

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☒ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 108.35 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 0.80 gal.

7. Volume of water removed from well 80.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing) a.	103.31 ft.	103.31 ft.
Date b.	11 / 02 / 2022 (m m / d d / y y y y)	11 / 02 / 2022 (m m / d d / y y y y)
Time c.	1 : 00 ☐ a.m. ☒ p.m.	2 : 00 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.1 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) very light brown turbid	Clear ☒ 20 Turbid ☐ 25 (Describe) clear
14. Total suspended solids	____ mg/l	289.0 mg/l
15. COD	____ mg/l	10.0 mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Veronica Last Name: Aranda
Firm: Short Elliott Hendrickson Inc.

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Stacie Last Name: Sanborn
Facility/Firm: Vernon County Solid Waste
Street: S3705 County Road LF
City/State/Zip: Viroqua, WI 54665

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Veronica Aranda
Print Name: Veronica Aranda
Firm: Short Elliott Hendrickson Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Vernon County Landfill	Vernon	MW-15WT

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
3268	62	WC335	127

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method DRY WELL

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☒ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other DRY WELL	☒

3. Time spent developing well 20 min.

4. Depth of well (from top of well casisng) 85.53 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing DRY gal.

7. Volume of water removed from well 0.0 gal.

8. Volume of water added (if any) 3.0 gal.

9. Source of water added water provided by Vernon County Highway Department

10. Analysis performed on water added? (If yes, attach results) ☒ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 85.13 ft.	85.53 ft.
Date	b. 11 / 02 / 2022 (m m d d y y y y)	11 / 02 / 2022 (m m d d y y y y)
Time	c. 10 : 40 ☒ a.m. ☐ p.m.	11 : 00 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	inches	inches
13. Water clarity	Clear ☐ 10 Turbid ☐ 15 (Describe)	Clear ☐ 20 Turbid ☐ 25 (Describe)
14. Total suspended solids	mg/l	mg/l
15. COD	mg/l	mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Veronica Last Name: Aranda
Firm: Short Elliott Hendrickson Inc.

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Stacie Last Name: Sanborn
Facility/Firm: Vernon County Solid Waste
Street: S3705 County Road LF
City/State/Zip: Viroqua, WI 54665

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Veronica Aranda
Print Name: Veronica Aranda
Firm: Short Elliott Hendrickson Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Vernon County Landfill	Vernon	MW-16WT

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
3268	62	WC336	129

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☒ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 77.6 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 0.3 gal.

7. Volume of water removed from well 6.0 gal.

8. Volume of water added (if any) 3.0 gal.

9. Source of water added water provided by Vernon County Highway Department

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 75.70 ft.	76.23 ft.
Date	b. 11 / 02 / 2022 (m m d d y y y y)	11 / 02 / 2022 (m m d d y y y y)
Time	c. 11 : 30 ☒ a.m. ☐ p.m.	12 : 30 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.2 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) light brown sandy/silty	Clear ☐ 20 Turbid ☒ 25 (Describe) light brown
14. Total suspended solids	mg/l	mg/l
15. COD	mg/l	mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Veronica Last Name: Aranda
Firm: Short Elliott Hendrickson Inc.

17. Additional comments on development:
Purged dry and very slow recharge. Therefore, not enough water to collect a sample.

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Stacie Last Name: Sanborn
Facility/Firm: Vernon County Solid Waste
Street: S3705 County Road LF
City/State/Zip: Viroqua, WI 54665

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Veronica Aranda
Print Name: Veronica Aranda
Firm: Short Elliott Hendrickson Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Vernon County Landfill	Vernon	MW-16

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
3268	62	WC337	131

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☒ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 99.8 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 2.5 gal.

7. Volume of water removed from well 2.5 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 84.49 ft.	84.49 ft.
Date	b. 11 / 02 / 2022 (m m / d d / y y y y)	11 / 02 / 2022 (m m / d d / y y y y)
Time	c. 2 : 30 ☐ a.m. ☒ p.m.	3 : 30 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☐ 20 Turbid ☒ 25
(Describe)	light brown, little silt	light brown
14. Total suspended solids	mg/l	273.0 mg/l
15. COD	mg/l	11.5 mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Veronica Last Name: Aranda
Firm: Short Elliott Hendrickson Inc.

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Stacie Last Name: Sanborn
Facility/Firm: Vernon County Solid Waste
Street: S3705 County Road LF
City/State/Zip: Viroqua, WI 54665

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Veronica Aranda
Print Name: Veronica Aranda
Firm: Short Elliott Hendrickson Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Vernon County Landfill	Vernon	MW-17WT

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
3268	62	WC338	133

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method
- surged with bailer and bailed ☐ 41
- surged with bailer and pumped ☐ 61
- surged with block and bailed ☐ 42
- surged with block and pumped ☒ 62
- surged with block, bailed and pumped ☐ 70
- compressed air ☐ 20
- bailed only ☐ 10
- pumped only ☐ 51
- pumped slowly ☐ 50
- Other _____ ☐ [illegible]

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 89.2 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 0.6 gal.

7. Volume of water removed from well 25.0 gal.

8. Volume of water added (if any) 15.0 gal.

9. Source of water added water provided by Vernon County Highway Department

10. Analysis performed on water added? (If yes, attach results) ☒ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing) a.	85.53 ft.	84.98 ft.
Date b.	11 / 02 / 2022 (m m / d d / y y y y)	11 / 02 / 2022 (m m / d d / y y y y)
Time c.	9 : 30 ☒ a.m. ☐ p.m.	10 : 30 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.6 inches	1.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) light brown sandy/silty	Clear ☐ 20 Turbid ☒ 25 (Describe) light brown
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	mg/l	58.4 mg/l
15. COD	mg/l	11.0 mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Veronica Last Name: Aranda
Firm: Short Elliott Hendrickson Inc.

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Stacie Last Name: Sanborn
Facility/Firm: Vernon County Solid Waste
Street: S3705 County Road LF
City/State/Zip: Viroqua, WI 54665

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Veronica Aranda
Print Name: Veronica Aranda
Firm: Short Elliott Hendrickson Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

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Attachment E

2022 Geophysics Boring Logs

BORING NUMBER MW-1

Short Elliott Hendrickson Inc.

CLIENT Vernon County
PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824
PROJECT LOCATION Viroqua, Wisconsin
DATE STARTED 12/29/87 **COMPLETED** 12/29/87
GROUND ELEVATION 1236.4 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Ace Well Drilling
GROUND WATER LEVELS:
DRILLING METHOD Air Rotary
AT TIME OF DRILLING ---
LOGGED BY Central Wis. Engineers **CHECKED BY** M. Lindenfelser
AT END OF DRILLING ---
NOTES Geophysical log completed by SEH during November 2022.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
0				(CL) Clay, Red		
28.0				1208.4		
				Dolomite - Broken Up		H5 - 1206.4
38.0				1198.4		
				Dolomite, Broken Up, With Some Streaks of Clay		

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\1678243-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
60				Dolomite, Broken Up, With Some Streaks of Clay *(continued)*		H4 - 1176.4
70						
80				80.0 1156.4 Dolomite, Hard, Crevice From 145' to 148', Set Well at 156.26'		H3 - 1156.4
90						
100						
110						H2 - 1120.4

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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BORING NUMBER MW-1

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
120				Dolomite, Hard, Crevice From 145' to 148', Set Well at 156.26' *(continued)*		
130						H1 - 1106.4
140						
150						
160						
170						
180						

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\1678243-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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BORING NUMBER MW-1

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
190				Dolomite, Hard, Crevice From 145' to 148', Set Well at 156.26' *(continued)*		
200				200.0 1036.4		

Bottom of borehole at 200.0 feet.

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

BORING NUMBER MW-1R

Short Elliott Hendrickson Inc.

CLIENT Vernon County
PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824
PROJECT LOCATION Viroqua, Wisconsin
DATE STARTED 1/10/94 **COMPLETED** 1/11/94
GROUND ELEVATION 1245 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Ace Well Drilling
GROUND WATER LEVELS:
DRILLING METHOD Air Rotary
AT TIME OF DRILLING ---
LOGGED BY Central Wis. Engineers **CHECKED BY** M. Lindenfelser
AT END OF DRILLING ---
NOTES Geophysical log completed by SEH during November 2022.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
0				(CL) unconsolodated silty, sandy clay		
10						
20						
30						
40						H5 - 1202.0
50						
				55.0	1190.0	

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZ\V\VERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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BORING NUMBER MW-1R

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
60				Sandy dolomite, yellow/tan, thinly bedded with shaley pantings		
70						H4 - 1173.0
				74.0 1171.0		
				Light tan dolomite, massive structure		
80						
90						H3 - 1155.0
100						
110						

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZ\VVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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BORING NUMBER MW-1R

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
120				Light tan dolomite, massive structure *(continued)*		
130						H2 - 1119.0
140				140.0 1105.0		
				Tan, Dolomite, well set @ 162'		H1 - 1105.0
150						
160				166.0 1079.0		

Bottom of borehole at 166.0 feet.

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSUZI\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

BORING NUMBER MW-2

Short Elliott Hendrickson Inc.

CLIENT Vernon County
PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824
PROJECT LOCATION Viroqua, Wisconsin
DATE STARTED 1/16/88 **COMPLETED** 1/16/88
GROUND ELEVATION 1252.5 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Ace Well Drilling
GROUND WATER LEVELS:
DRILLING METHOD Air Rotary
AT TIME OF DRILLING ---
LOGGED BY Central Wis. Engineers **CHECKED BY** M. Lindenfelser
AT END OF DRILLING ---
NOTES Geophysical log completed by SEH during November 2022.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
0				(CL) Clay, Red		
30				30.0 1222.5 Dolomite With Clay Streaks		
40				40.0 1212.5 Dolomite, Hard		H5 - 1209.5

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TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

BORING NUMBER MW-2

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
60				Dolomite, Hard *(continued)*		
				60.0 1192.5		
				Dolomite - Broken Up With Crevice From 95' - 96'		
70						
						H4 - 1177.5
80						
90						
						H3 - 1156.5
100				100.0 1152.5		
				Dolomite, Hard, With Occasional Soft Zones. ell Set at 172.73'		
110						

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
120				Dolomite, Hard, With Occasional Soft Zones. ell Set at 172.73' *(continued)*		
130						H2 - 1122.5
140						H1 - 1110.5
150						
160						
170						
180						

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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BORING NUMBER MW-2

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
190				Dolomite, Hard, With Occasional Soft Zones. ell Set at 172.73' *(continued)*		
				190.0 1062.5		

Bottom of borehole at 190.0 feet.

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

BORING NUMBER MW-5

Short Elliott Hendrickson Inc.

CLIENT Vernon County
PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824
PROJECT LOCATION Viroqua, Wisconsin
DATE STARTED 2/16/88 **COMPLETED** 2/16/88
GROUND ELEVATION 1223.3 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Ace Well Drilling
GROUND WATER LEVELS:
DRILLING METHOD Air Rotary
AT TIME OF DRILLING ---
LOGGED BY Central Wis. Engineers **CHECKED BY** M. Lindenfelser
AT END OF DRILLING ---
NOTES Geophysical log completed by SEH during November 2022.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
0				(CL) Clay, Red		
20.0				1203.3		
				Dolomite With Streaks of Clay		
35.0				1188.3		
				Dolomite, Broken Up, With Crevices at: 43'-44' (1179.3-1180.3), 65'-67' (1156.3-1158.3), 87'-88' (1135.3-1136.3), and 93'-94' (1129.3-1130.3)		

H5 - 1207.3

H4 - 1177.3

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
60				Dolomite, Broken Up, With Crevices at: 43'-44' (1179.3-1180.3), 65'-67' (1156.3-1158.3), 87'-88' (1135.3-1136.3), and 93'-94' (1129.3-1130.3) *(continued)*		
70						H3 - 1157.3
80						
90						
100				102.0 1121.3 Dolomite, Hard		H2 - 1118.3
110						H1 - 1107.3

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BORING NUMBER MW-5

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
120				Dolomite, Hard *(continued)*		
130						
				135.0 1088.3		
				Dolomite, Broken Up, With Crevices at: 135' to 137' (1086.3-1088.3), 158' to 160' (1063.3-1065.3), Set Well at 158.57' (1064.73)		
140						
150						
160						
170						
180				180.0 1043.3		

Bottom of borehole at 180.0 feet.

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSUZ\VIVERSW\1678243-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

BORING NUMBER MW-6

Short Elliott Hendrickson Inc.

CLIENT Vernon County
PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824
PROJECT LOCATION Viroqua, Wisconsin
DATE STARTED 2/19/88 **COMPLETED** 2/19/88
GROUND ELEVATION 1233 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Ace Well Drilling
GROUND WATER LEVELS:
DRILLING METHOD Air Rotary
AT TIME OF DRILLING ---
LOGGED BY Central Wis. Engineers **CHECKED BY** M. Lindenfelser
AT END OF DRILLING ---
NOTES Geophysical log completed by SEH during November 2022.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
0				(CL) Clay, Red		
14.0					1219.0	
				Dolomite, Broken Up With Crevices At: 23'-25' (1208.0-12l0.0) and 28'-29' (1204.0-1205.0)		H5 - 1208.0

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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BORING NUMBER MW-6

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
60				Dolomite, Broken Up With Crevices At: 23'-25' (1208.0-12l0.0) and 28'-29' (1204.0-1205.0) *(continued)*		H4 - 1173.0
70						
80				80.0 1153.0		
				Dolomite, Fairly Consistent		H3 - 1149.0
90						
100						
110						H2 - 1118.0

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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BORING NUMBER MW-6

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
120				Dolomite, Fairly Consistent *(continued)*		
130						H1 - 1107.0
140						
150						
160						
170						
180				180.0 1053.0		

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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BORING NUMBER MW-6

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
190				Dolomite, Sandy Set Well at 199.93' (1033.07) *(continued)*		
200						
210				210.0 1023.0		

Bottom of borehole at 210.0 feet.

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\1678243-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

BORING NUMBER MW-7

Short Elliott Hendrickson Inc.

CLIENT Vernon County
PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824
PROJECT LOCATION Viroqua, Wisconsin
DATE STARTED 12/22/89 **COMPLETED** 12/22/89
GROUND ELEVATION 1255.7 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Exploration Technology
GROUND WATER LEVELS:
DRILLING METHOD Mud Rotary
AT TIME OF DRILLING ---
LOGGED BY Central Wis. Engineers **CHECKED BY** M. Lindenfelser
AT END OF DRILLING ---
NOTES Geophysical log completed by SEH during November 2022.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
0				0.5 (OL) TOPSOIL 1255.2 (CL) Clay, light Brown to Gray-Brown,		
				7.0 1248.7 (CL) Clay, Red-Brown to Yellow, With Red Sand		
10				10.5 1245.2 (CL) Clay, Red-Brown, With Occasional Silt and Sand		
20				21.5 1234.2 Weathered Dolomite With Interspersed Red Clay Residuum		
30						
40						
				44.0 1211.7 Dolomite, With Occasional Small Vugs and Chert		
50						H5 - 1205.7

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
				Dolomite, With Occasional Small Vugs and Chert *(continued)*		
				58.0 1197.7		
				Dolomite, With Occasional large Vugs		
60						
70						
				72.0 1183.7		
				Dolomite, With Occasional Small Vugs		
80						H4 - 1173.7
90						
100						H3 - 1149.7
110						

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZ\V\VERSW\1678243-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
120				Dolomite, With Occasional Small Vugs *(continued)*		
130				130.0 1125.7 Sandy Dolomite, With Occasional Gray-Green hale Interbeds; Few to No Vugs		H2 - 1119.7
140						
				148.0 1107.7 Dolomite, With Occasional Sandy To Shaly Interbeds; Few Small Vugs		H1 - 1107.7
150				153.0 1102.7 Sandy Dolomite 155.0 1100.7 Dolomite, With Occasional Sandy to Shaly Interbeds; Few Small Vugs		
160						
170				169.0 1086.7 Sandy Dolomite, With Occasional Brown Sandstone Interbeds; Few to No Vugs		
180						

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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BORING NUMBER MW-7

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
				Sandy Dolomite, With Occasional Brown Sandstone Interbeds; Few to No Vugs *(continued)*		
				186.5 1069.2		
				(SP) Sand, Brown, Med-Fine		
				188.5 1067.2		
190				Dolomite, With Occasional Sandy to Shaly Interbeds		
				193.0 1062.7		
				Sandy Dolomite With Occasional White to Brown Sandstone and Gray-Green Shale Interbeds		
200						
				209.0 1046.7		
210				Sandy Dolomite		
220						
230						
				234.5 1021.2		

Bottom of borehole at 234.5 feet.

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

BORING NUMBER MW-12

Short Elliott Hendrickson Inc.

CLIENT Vernon County
PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824
PROJECT LOCATION Viroqua, Wisconsin
DATE STARTED 9/22/89 **COMPLETED** 9/22/89
GROUND ELEVATION 1216.4 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Exploration Technology
GROUND WATER LEVELS:
DRILLING METHOD Mud Rotary
AT TIME OF DRILLING ---
LOGGED BY Central Wis. Engineers **CHECKED BY** M. Lindenfelser
AT END OF DRILLING ---
NOTES Geophysical log completed by SEH during November 2022.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
0				0.5 (OL) Topsoil Disturbed 1215.9		
				(CL-ML) Silt/Glay, Lt. Brown		
				4.5 1211.9		
				(SP) Med. Sand, Red-Brown, With Some Clay		
				7.0 1209.4		
				(CL-ML) Clay/Silt, Lt. Gray-Brown, With Pebbles@ 9.0'		
10				9.5 1206.9		
				(SP) Med. Sand, Red-Brown, With Some Glay		
				14.5 1201.9		H5 - 1201.9
				(SP) Med. Sand, Tan to Brown, With Clay		
				18.0 1198.4		
20				(SP) Med. Sand, Yellow to Lt. Brown to Red-Brown, With Silt, Trace Glay		
				24.5 1191.9		
				Poor Quality Dolomite w/Clay Residuum		
30						
40						H4 - 1172.4
50						

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TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

BORING NUMBER MW-12

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
				Poor Quality Dolomite w/Clay Residuum *(continued)*		
60				61.0 1155.4		H3 - 1155.4
				Dolomite, With Occasional Small Vugs		
70				71.5 1144.9		
				Poorly Consolidated Silty Sandstone		
				74.0 1142.4		
				Dolomite, With Occasional Small Vugs		
80						
90						
100				100.0 1116.4		
				Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds		
				103.0 1113.4		

Bottom of borehole at 103.0 feet.

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSUZV\VERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

BORING NUMBER MW-14WT

Short Elliott Hendrickson Inc.

CLIENT Vernon County
PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824
PROJECT LOCATION Viroqua, Wisconsin
DATE STARTED 8/29/22 **COMPLETED** 9/20/22
GROUND ELEVATION 1247.15 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Braun Intertec
GROUND WATER LEVELS:
DRILLING METHOD HSA, Mud Rotary, Coring
AT TIME OF DRILLING ---
LOGGED BY B. Kolter **CHECKED BY** M. Lindenfelser
AT END OF DRILLING ---
NOTES Geophysical log completed by SEH during November 2022.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION		GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
0	AU 1			(CL) LEAN CLAY WITH SAND (CL), brown to light brown, moist, medium plasticity, mottled (Residuum)			
	SS 2	100					
	SS 3	100			5.5 1241.7		
	SS 4	100		(CH) FAT CLAY WITH SAND (CH), light brown, moist, little gravel, stiff (Residuum) NOTE: Mottled below 7 feet bgs.			
10	SS 5	33			12.0 1235.2		
	SS 6	89		(CL) SANDY LEAN CLAY (CL), brown, moist, trace gravel, mottled (Residuum)			
				NOTE: Light brown sand layer <1" thick at 13.5 feet bgs.	14.5 1232.7		
	SS 7	89		(CH) FAT CLAY (CH), brown to reddish brown, moist, little sand, stiff (Residuum) NOTE: Light brown sand layer <1" thick at 15 feet bgs.			
	SS 8	100					
20	SS 9	100					
	SS 10	100			26.0 1221.2		
				(CL) SANDY LEAN CLAY (CL), brown, moist, stiff	28.5 1218.7		
	SH 11	100		DOLOSTONE, fractured, hard drilling from 28.5 to 33.5 feet, switched to mud rotary at 33.5 feet	29.5 1217.7		
30	SS 12	20		No recovery			
	SS 13						
	SS 14				36.9 1210.3		
	RC 15	4		DOLOSTONE, light brown to buff, fine grained, <5mm vugs throughout, no bedding, slightly decomposed, trace mineralization, iron oxide staining, void from 37.0 to 39.0 feet, switched to mud rotary at 41.5 feet			H5 - 1209.2
40							
					44.5 1202.7		
	SS 16			No recovery, void from 48.0 to 49.0 feet			
					49.5 1197.7		
50	SS 17	80		Light brown poorly graded sand, fine to coarse			
					52.5 1194.7		
				DOLOSTONE, gray to brown, fine grained, 5 to 10mm vugs throughout with mineralization, chert at approximately 53.0 feet, very fractured, difficult coring.			

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BORING NUMBER MW-14WT

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
60	RC 18	41		DOLOSTONE, gray to brown, fine grained, 5 to 10mm vugs throughout with mineralization, chert at approximately 53.0 feet, very fractured, difficult coring. *(continued)*		
				60.5 1186.7 End of coring at 60.5 feet due to formation too difficult to core.		
70						H4 - 1173.2
80						
90						H3 - 1153.2
100				109.0 1138.2		

Boring Terminated at 109 feet.
Bottom of borehole at 109.0 feet.

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BORING NUMBER MW-14Z

Short Elliott Hendrickson Inc.

CLIENT Vernon County
PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824
PROJECT LOCATION Viroqua, Wisconsin
DATE STARTED 3/5/03 **COMPLETED** 3/7/03
GROUND ELEVATION 1247.5 ft **HOLE SIZE** 7 inches
DRILLING CONTRACTOR Braun Intertec
GROUND WATER LEVELS:
DRILLING METHOD Rotasonic
AT TIME OF DRILLING ---
LOGGED BY Central Wis. Engineers **CHECKED BY** M. Lindenfelser
AT END OF DRILLING ---
NOTES Geophysical log completed by SEH during November 2022.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
0				(CL) Yellowish brown clayey silt, little sand (loess)		
6.0				1241.5		
				(CL) Reddish brown sandy clayey silt		
8.0				1239.5		
				(SC) Red, clay yellow, brown silty sand w/varying amounts of clay		
13.0				1234.5		
				(SM)		
18.0				1229.5		
				(CL) Red, yellow, brown sandy, clayey silt		
22.0				1225.5		
				(SM) Red, yellow, brown silty sand w/varying amounts of clay		
40.0				1207.5		
				(CL) Yellow, red, brown sandy, clayey silt w/little gravel		H5 - 1205.5
47.0				1200.5		
				(CH) Brown sandy clayey silt and silty clay w/little gravel		
51.0				1196.5		
				(SM) Yellowish brown silty sand w/varying amounts of clay and occasional clay lenses		
55.0				1192.5		

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BORING NUMBER MW-14Z

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
				(SP-SM)		
				58.0 1189.5		
				(SM)		
60				62.0 1185.5		
				(SC) Brown silty clayey sand and sandy, clayey silt, little to trace gravel		
				66.0 1181.5		
				(CL)		
70				71.0 1176.5		
				(SM) Grayish brown silty sand, little to trace clay and occasional coarse gravel		H4 - 1173.5
80						
				84.0 1163.5		
				(ML)		
90						H3 - 1153.5
				96.0 1151.5		
				(GM) Same, but with increasing coarse gravel		
100				100.0 1147.5		
				Dolomite, occasional small vugs, (Highly fractured zone @ 110' - 111' and 118' - 120')		
110						

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CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
120				Dolomite, occasional small vugs, (Highly fractured zone @ 110' - 111' and 118' - 120') *(continued)*		
				126.0 1121.5 Sandy Dolomite		
130				130.0 1117.5 Dolomite		H2 - 1118.5
				133.0 1114.5 sandy Dolomite with Grey-Green Shale and Sandstone Interbeds		
140				140.0 1107.5 Dolomite, occas ional small vugs (Highly fractured zone @ 142' - 143', 154' - 156', 158' - 159', and 175' - 177')		H1 - 1107.5
150						
160						
170						
				178.0 1069.5 Sandy siltstone		
180				180.0 1067.5		

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BORING NUMBER MW-14Z

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION		GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
				182.0 Dolomite (Highly fractured zone @ 183' - 186') *(continued)*	1065.5		
				Sandy dolomite and dolomitic sandstone (Highly fractured zone @ 191' - 195' and 198' - 199')			
190							
200							
				206.0	1041.5		
				Silty, dolomitic sandstone with shale partings			
210				210.0	1037.5		

Bottom of borehole at 210.0 feet.

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BORING NUMBER MW-15WT

Short Elliott Hendrickson Inc.

CLIENT Vernon County
PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824
PROJECT LOCATION Viroqua, Wisconsin
DATE STARTED 9/26/22 **COMPLETED** 9/27/22
GROUND ELEVATION 1220.61 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Braun Intertec
GROUND WATER LEVELS:
DRILLING METHOD HSA, Mud Rotary
AT TIME OF DRILLING ---
LOGGED BY R. Hawkins **CHECKED BY** M. Lindenfelser
AT END OF DRILLING ---
NOTES Geophysical log completed by SEH during November 2022.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
0	AU 1			0.7 (SM) SILTY SAND (SM), dark brown, moist, fine grained, trace organics (Topsoil) 1220.0		
	SS 2	78		(CL) LEAN CLAY WITH SAND (CL), brown to dark brown, moist, with silt, low plasticity (Residuum)		
	SS 3	22		7.0 1213.6		
	SS 4	89		7.5 (SC) CLAYEY SAND (SC), reddish brown, moist, fine to medium grained, trace gravel (Residuum) 1213.1		
10	SS 5	78		(CL) LEAN CLAY WITH SAND (CL), light brown to to brown, moist, medium plasticity, stratified with light gray to red fat clay (CH) lenses < 1cm thick (Residuum)		
	SS 6	78		NOTE Occasional sand layers throughout sample 5. NOTE: Sample 6 highly disturbed due to gravel.		
				14.5 1206.1		
	SS 7	89		(CH) FAT CLAY (CH), brown to reddish brown, moist, high plasticity, mottled, with sand (Residuum)		
	SS 8	100		NOTE: Started mud rotary drilling after sample 8.		H5 - 1202.6
20	SS 9	89		NOTE: Occasional clayey sand (SC) layers throughout sample 9.		
	SS 10	100				
30	SS 11	89				
	SS 12	78				
				39.5 1181.1		
40	SS 13	75		WEATHERED SANDSTONE, light brown fine grained, moderately cemented, highly to completely weathered (Saprolite).		
	SS 14	114		NOTE: poorly cemented with occasional silt layers throughout sample 14.		
50	SS 15	92				H4 - 1170.6

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BORING NUMBER MW-15WT

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
60	SS 16	78		WEATHERED SANDSTONE, light brown fine grained, moderately cemented, highly to completely weathered (Saprolite). *(continued)*		
	SS 17	78				H3 - 1155.6
70	SS 18	50		69.5 1151.1 SANDY DOLOSTONE, light brown, moderately weathered to fresh.		
80						
90				99.0 1121.6		

Boring Terminated at 99 feet.
Bottom of borehole at 99.0 feet.

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

BORING NUMBER MW-17WT

Short Elliott Hendrickson Inc.

CLIENT Vernon County
PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824
PROJECT LOCATION Viroqua, Wisconsin
DATE STARTED 9/21/22 **COMPLETED** 9/23/22
GROUND ELEVATION 1196.43 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Braun Intertec
GROUND WATER LEVELS:
DRILLING METHOD HSA, Mud Rotary
AT TIME OF DRILLING ---
LOGGED BY B. Kolter **CHECKED BY** M. Lindenfelser
AT END OF DRILLING ---
NOTES Geophysical log completed by SEH during November 2022.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
0	AU 1			(CL) LEAN CLAY WITH SAND (CL), brown (Residuum)		
				2.0 / 1194.4		
	SS 2	100		(SC) CLAYEY SAND (SC), brown, rock fragments at 4.5 to 6 and 7 to 8.5 feet bgs, poorly graded sand seam (1 inch) at 8.4 feet, rough drilling from 7.5 to 8 feet bgs (Residuum).		
	SS 3	67				
	SS 4	100				
10	SS 5	100		11.0 / 1185.4		
	SS 6	100		WEATHERED SANDSTONE, light brown, very friable, iron oxide staining (Saprolite).		
	SS 7	100				
	SS 8	100				
20	SS 9	100				
	SS 10	100				H4 - 1170.4
30	SS 11	78				
				34.5 / 1161.9		
	SS 12	89		36.0 / 1160.4 WEATHERED SANDSTONE, Dark brown, very friable, iron oxide staining (Saprolite).		
				WEATHERED SANDSTONE, brown to dark brown, clayey, very friable (Saprolite).		
40	SS 13	78				H3 - 1156.4
	SS 14	44				
50	SS 15	44				

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BORING NUMBER MW-17WT

Short Elliott Hendrickson Inc.

CLIENT Vernon County **PROJECT NAME** Vernon County Landfill

PROJECT NUMBER VERSW 167824 **PROJECT LOCATION** Viroqua, Wisconsin

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
	SS 16	100		WEATHERED SANDSTONE, brown to dark brown, clayey, very friable (Saprolite). *(continued)*		
60	SS 17	44				
	SS 18	6				
70						H2 - 1126.4
80						
90						
				93.0 1103.4		

Boring Terminated at 93 feet.
Bottom of borehole at 93.0 feet.

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTSIUZ\VIVERSW\167824\3-ENV-STDY-REGS\31-ENV-RPT\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

Attachment F

2022 Geotechnical Testing Report

Geotechnical Factual Report

Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

Prepared for

Vernon County Solid Waste & Recycling Department

Project B2205032

July 12, 2023
Braun Intertec Corporation

BRAUN INTERTEC
The Science You Build On.

Braun Intertec Corporation
2309 Palace Street
La Crosse, WI 54603

Phone: 608.781.7277
Fax: 608.781.7279
Web: braunintertec.com

July 12, 2023 Project B2205032

Ms. Stacie Sanborn
Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Re: Geotechnical Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

Dear Ms. Sanborn:

We are pleased to present this Geotechnical Factual Report for the Vernon County Landfill located at S3705 County Road LF in Viroqua, Wisconsin. This summary report provides our borings logs and laboratory test results for the project.

Thank you for making Braun Intertec your geotechnical consultant for this project. If you have questions about this report, or if there are other services that we can provide in support of our work to date, please contact Brandon Wright at 608.781.7277 or by email (bwright@braunintertec.com).

Sincerely,

BRAUN INTERTEC CORPORATION

Brandon K. Wright, PE
Technical Manager, Senior Engineer

Philip E. Bailey, PE
Business Unit Leader, Senior Engineer

C: Ms. Melissa Lindenfelser, Short Elliott Hendrickson

AA/EOE

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Appendix A
Soil Boring Location Sketch
Log of Boring Sheets B-18 to B-21 & MW-14WT to MW-17WT
Descriptive Terminology of Soil

Appendix B
Laboratory Test Results
-Classification Test Results (4)
-Atterberg Limits (2)
-Sieve Hydrometer Test Results (23)
-Proctor Test Results (6)
-Hydraulic Conductivity (5)
-Specific Gravity (2)
-Triaxial (CU) Test Results (5)

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A. Introduction

A.1. Project Description

This Geotechnical Factual Report provides a summary of our subsurface exploration and laboratory test results for the Vernon County Landfill located at S3705 County Road LF in Viroqua, Wisconsin.

A.2. Site Conditions and History

Currently, the site exists as an active landfill. An aerial photograph of the site is shown in Photograph 1 below.

Photograph 1. Aerial Photograph of the Site



Photograph provided by Google Earth™.

A.3. Background Information and Reference Documents

We reviewed the following information:

- Aerial photographs of the site on Google Earth™
- Web based Geographic Information Systems (GIS) sites to assess topographic data and land records for the site.
- Communications with Short Elliott Hendrickson regarding project details.

A.4. Scope of Services

We performed our scope of services for the project in accordance with our Proposal QTB156849 to Vernon County Solid Waste and Recycling Department care of Short Elliott Hendrickson, dated April 22, 2022. The following list describes the geotechnical tasks completed in accordance with our authorized scope of services.

- Clearing the exploration location of underground utilities. Short Elliott Hendrickson selected the exploration locations. Ground elevations and boring coordinates were collected by others and were later provided to us. The Soil Boring Location Sketch included in the Appendix shows the approximate locations of the borings.
- Performing eight (8) standard penetration test (SPT) borings, denoted as Borings B-18 to B-21 & MW-14WT to MW-17WT. Four of the borings were drilled to depths of 30 feet and four borings were drilled depths of 100 feet to allow for installation of permanent groundwater monitoring wells.
- Performing laboratory testing on select samples.
- Preparing this report containing a boring location sketch, logs of soil borings, a summary of the soils encountered, and results of laboratory testing.

B. Results

B.1. Geologic Overview

We based the geologic origins used in this report on the soil types, laboratory testing, and available common knowledge of the geological history of the site. Because of the complex depositional history, geologic origins can be difficult to ascertain. We did not perform a detailed investigation of the geologic history for the site.

B.2. Boring Results

Table 1 provides a summary of the soil boring results; in the general order we encountered the strata. Please refer to the Log of Boring sheets in the Appendix for additional details.

Table 1. Subsurface Profile Summary*

Strata**	Soil Type - ASTM Classification	Range of Penetration Resistances	Commentary and Details
Topsoil Fill	CL, CH, SC	NA	▪ Topsoil was composed of lean clay, fat clay, and clayey sand. ▪ Contained trace roots and was dark brown to black. ▪ Thickness was about 1 to 1 ½-feet. ▪ Moisture condition was moist.
Fill***	CH, CL, CL-ML, ML, SP, SC, GC	2 to 80 BPF	▪ Beneath the topsoil fill, the borings encountered fill. ▪ Fill extended to depths of 9 to 31 feet. ▪ Fill is composed mainly of clayey soils, but also contained sand and gravels intermixed with clayey and silty soils. ▪ Penetration resistance testing in the fill suggests the fill was not placed or compacted uniformly. ▪ Moisture condition was moist.
Alluvial	SC, SM, SP-SM, CH, CL, ML	2 to 20 BPF	▪ Beneath the fill, the borings encountered alluvial soils. ▪ Alluvial soils were intermixed and were composed of sand, silt, and clay soils. ▪ Penetration resistance testing indicates the clayey soils are soft to very stiff and the silty and sandy soils are loose to medium dense. ▪ Moisture condition (dry, moist, or wet).

Strata**	Soil Type - ASTM Classification	Range of Penetration Resistances	Commentary and Details
Residuum	CL, CH, SC	11 to 22 BPF & >50	▪ Below the fill and alluvial soils, the borings encountered residual soils. ▪ Residual soils were composed sand, silt, clay, and gravel soils. ▪ Penetration resistance testing in the clayey soils indicate it was stiff to hard. ▪ Penetration resistance testing in the sand and gravel soils indicates it was medium dense to very dense.
	SP, ML, SM	20 to 47 BPF & >50	
	GM, GC	24 to 36 & BPF >50	
Bedrock	Dolostone	50 blows for less than 6 inches of penetration	▪ Below the alluvial and residual soils, our borings encountered dolostone bedrock. Retrieved split-spoon samples in the bedrock were tan and were dry to moist. The retrieved samples were slightly- to highly-weathered. ▪ The bedrock was cored at one location. The rock cores returned RQD values from 8 to 16 and recovery varied from 30 to 44 percent.

*Abbreviations defined in the attached Descriptive Terminology sheets.
**It should be noted that collected SPT samples for Borings MW-14WT and MW-16 were collected with a failing hollow-stem auger plug. The soil samples from these two borings are still generally representative of the soil column above the bedrock, they may not be representative of those specific depths and may be mixed with soil from other strata.
***For simplicity in this report, we define existing fill to mean existing, uncontrolled, or undocumented fill.

B.3. Groundwater

We did not observe groundwater while performing our borings. Groundwater may take days or longer to reach equilibrium in the boreholes and we immediately backfilled the boreholes, in accordance with our scope of work. If the project team identifies a need for more accurate determination of groundwater depth, we can install piezometers. Project planning should anticipate seasonal and annual fluctuations of groundwater. Following installation of monitoring wells, Short Elliott Hendrickson measured groundwater elevations as noted in Table 2.

Table 2. Monitoring Well Summary

Location	Measured Depth to Groundwater (ft)	Corresponding Elevation (ft)
MW-14WT	100.63	1146.52
MW-15WT	Not Observed	Not Observed
MW-16	81.54	1102.73
MW-17WT	80.27	1116.16

B.4. Laboratory Test Results

Laboratory testing was completed in general accordance with American Society for Testing and Materials (ASTM) standards. More information including soil characteristics and laboratory test results are presented in the following subsections.

B.4.a. Laboratory Soil Classification Tests

Tables 3 and 4 present the results of our laboratory tests.

Table 3. Laboratory Classification Test Results

Boring	Sample Depth (ft)	USCS Soil Classification	Moisture Content (w, %)	Liquid Limit	Plastic Index	Particle Size			
						% Gravel	% Sand	% Silt	% Clay
B-18	0 – 2	CL	20	38	19	1.1	14.6	54.0	30.3
B-18	2 ½	CH	27	64	40	0.0	14.4	20.4	65.2
B-18	5	CH	27	51	32	0.0	36.5	17.7	45.8
B-18	7 ½	SP	10	---	---	---	---	---	---
B-18	10	SC	15	39	24	0.0	58.6	8.9	32.5
B-18	12 ½	CH	27	72	49	0.0	29.5	14.2	56.3
B-18	15	SC	20	---	---	---	---	---	---
B-18	17 ½	CH	16	---	---	---	---	---	---
B-19	0 – 2	CH	---	50	33	0.0	25.5	30.5	44.0
B-19*	0 – 2	CH	---	51	33	---	---	---	---
B-19	2 ½	CH	16	52	33	23.7	22.7	22.1	31.5
B-19	5	CH	44	---	---	---	---	---	---
B-19	7 ½	CH	53	---	---	---	---	---	---
B-19	10	CH	54	---	---	---	---	---	---
B-19	12 ½	GC	33	---	---	---	---	---	---
B-19	15	GC	40	---	---	---	---	---	---
B-19	17 ½	CH	57	105	71	0.0	3.3	8.4	88.3
B-19	20	CH	57	---	---	---	---	---	---
B-20	0 – 2	CH	---	58	42	0.0	35.1	16.2	48.7
B-20*	0 – 2	CL	---	35	12	---	---	---	---
B-20	2 ½	CL	19	---	---	---	---	---	---
B-20	5	CL	27	---	---	---	---	---	---
B-20	7 ½	CH	33	---	---	---	---	---	---
B-20	10	SC	15	---	---	---	---	---	---
B-20	12 ½	CH	30	---	---	---	---	---	---

Boring	Sample Depth (ft)	USCS Soil Classification	Moisture Content (w, %)	Liquid Limit	Plastic Index	Particle Size			
						% Gravel	% Sand	% Silt	% Clay
B-20	15	CH	46	---	---	---	---	---	---
B-20	17 ½	CH	39	---	---	---	---	---	---
B-21	0 – 2	CH	---	67	48	0.0	25.4	26.4	48.2
B-21	2 ½	CH	24	50	34	0.0	24.5	29.3	46.2
B-21	5	CH	25	---	---	---	---	---	---
B-21	7 ½	ML	19	---	---	---	---	---	---
B-21	10	CL	17	36	18	2.9	11.5	56.6	29
B-21	12 ½	CL	19	36	14	0.0	6.2	65.2	28.6
B-21	15	CL	20	---	---	---	---	---	---
B-21	17 ½	CL	18	36	18	0.0	11.6	58.8	29.6
B-21	20	CL	19	40	21	0.0	4.9	63.6	31.5
B-21	25	CL	19	---	---	---	---	---	---
B-21	30	CL	18	33	13	0.0	1.4	72.7	25.9

*Bulk samples collected on May 24, 2023.

Table 4. Laboratory Classification Test Results

Boring	Sample Depth (ft)	USCS Soil Classification	Moisture Content (w, %)	Liquid Limit	Plastic Index	Particle Size			
						% Gravel	% Sand	% Silt	% Clay
MW-14WT	7 ½	CH	37	64	42	0.0	32.0	9.8	58.2
MW-15WT	17 ½	CH	46	109	73	0.0	2.6	7.5	89.9
MW-16	7 – 9	CL	---	43	21	---	---	---	---
MW-16	10 – 12	CL	24	37	16	0.0	3.9	66.0	30.1
MW-16	25	SC	18	41	24	0.0	62.1	11.4	26.5
MW-17WT	5	SC	20	59	40	12.7	44.6	7.8	34.9
MW-17WT	7 ½	SC	17	39	27	8.9	47.7	13.4	30.0
MW-17WT	10	SC	16	41	29	0.0	51.9	14.2	33.9

B.4.b. Moisture-Density Relationship (Proctor Tests)

We performed standard and modified Proctor tests on bulk samples collected from subgrade soils. The results are presented in Table 5.

Table 5. Standard and Modified Proctor Summary

Boring	Depth (ft)	Standard Proctor (ASTM D698)		Modified Proctor (ASTM D1557)	
		Maximum Dry Density (pcf)	Optimum Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)
B-19	0 – 2	105.0	19.6	116.7	15.0
B-19*	0 – 2	104.3	17.8	---	---
B-20*	0 – 2	106.0	19.6	---	---
B-21	0 – 2	100.0	22.1	112.3	16.1

*Bulk samples collected on May 24, 2023.

B.4.c. Remolded Permeability Tests

We performed remolded permeability tests on bulk samples of the materials obtained from within the upper 2 feet of the borings in accordance with ASTM D5084. The results of the permeability tests are presented in Table 6.

Table 6. Summary of Hydraulic Conductivity

Boring	Depth (ft)	USCS Soil	Moisture (%)		Density (pcf)		Average Hydraulic Conductivity (cm/sec)
			Initial	Final	Initial	Final	
B-19*	0 – 2	CH	18.0	24.3	106.3	101.1	5.4 E-09
B-19*	0 – 2	CH	19.7	24.3	101.6	100.9	6.1 E-09
B-20*	0 – 2	CL	22.0	24.8	98.4	99.7	3.0 E-07
MW-14WT	26 – 28 ½	CL	25.3	24.1	101.2	102.9	3.1 E-08
MW-16	10 – 12	CL	25.7	25.4	103.3	102.6	3.0 E-08

*Bulk samples collected on May 24, 2023.

B.4.d. Specific Gravity

We performed specific gravity tests on bulk samples collected from Boring B-19 and B-20. The specific gravity for each sample is summarized in Table 7.

Table 7. Summary of Specific Gravity

Boring	Depth	USCS Soil	Specific Gravity
B-19*	0 – 2	CH	2.67
B-20*	0 – 2	CL	2.66

*Bulk samples collected on May 24, 2023.

B.4.e. Triaxial Test Results

We performed consolidated undrained triaxial tests in accordance with the ASTM D4767. The results of this test are summarized in Table 8.

Table 8. Summary of Triaxial Tests

Boring	Depth (ft)	Item	Consolidated Undrained (CU)		Unconsolidated Undrained (UU)
			Total	Effective	
B-19*	0 – 2	Cohesion, tsf	0.2742	0.2097	0.7848
		ϕ, degrees	12.5	23.3	0
		tan (ϕ)	0.22	0.43	0
B-20*	0 – 2	Cohesion, tsf	0.4281	0	0.4152
		ϕ, degrees	15.4	34.8	0
		tan (ϕ)	0.28	0.69	0
MW-16	7 – 9	Cohesion, tsf	0.9366	0.2976	---
		ϕ, degrees	11.4	28.5	---
		tan (ϕ)	0.20	0.54	---

*Bulk samples collected on May 24, 2023.

C. Procedures

C.1. Penetration Test Borings

We drilled the penetration test borings with an all-terrain core and auger drill equipped with hollow-stem auger. We performed the borings in general accordance with ASTM D6151 taking penetration test samples at 2 1/2- or 5-foot intervals in general accordance with ASTM D1586. We collected thin-walled tube samples in general accordance with ASTM D1587 at selected depths. The boring logs show the actual sample intervals and corresponding depths. We also collected bulk samples of auger cuttings at selected locations for laboratory testing.

C.2. Exploration Logs

C.2.a. Log of Boring Sheets

The Appendix includes Log of Boring sheets for our penetration test borings. The logs identify and describe the penetrated geologic materials and present the results of penetration resistance tests performed. The logs also present the results of laboratory tests performed on penetration test samples, and groundwater measurements.

We inferred strata boundaries from changes in the penetration test samples and the auger cuttings. Because we did not perform continuous sampling, the strata boundary depths are only approximate. The boundary depths vary away from the boring locations, and the boundaries themselves may occur as gradual rather than abrupt transitions.

C.2.b. Geologic Origins

We assigned geologic origins to the materials shown on the logs and referenced within this report, based on: (1) a review of the background information and reference documents cited above, (2) visual classification of the various geologic material samples retrieved during the course of our subsurface exploration, (3) penetration resistance testing performed for the project, (4) laboratory test results, and (5) available common knowledge of the geologic processes and environments that have impacted the site and surrounding area in the past.

C.3. Material Classification and Testing

C.3.a. Visual and Manual Classification

We visually and manually classified the geologic materials encountered based on ASTM D2488. When we performed laboratory classification tests, we used the results to classify the geologic materials in accordance with ASTM D2487. The Appendix includes a chart explaining the classification system we used.

C.3.b. Laboratory Testing

The exploration logs in the Appendix note most of the results of the laboratory tests performed on geologic material samples. The remaining laboratory test results follow the exploration logs. We performed the tests in general accordance with ASTM procedures.

C.4. Groundwater Measurements

The drillers checked for groundwater while advancing the penetration test borings, and again after auger withdrawal. Where monitoring wells were installed, Short Elliott Hendrickson measured and recorded observed groundwater depths.

D. Qualifications

D.1. Variations in Subsurface Conditions

D.1.a. Material Strata

We developed our boring logs from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth. Therefore, we must infer strata boundaries and thicknesses. Strata boundaries may also be gradual transitions, and project planning should expect the strata to vary in depth, elevation, and thickness, away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until performing additional exploration work or starting construction.

D.1.b. Groundwater Levels

We made groundwater measurements under the conditions reported herein and shown on the exploration logs and interpreted in the text of this report. Note that the observation periods were short, and project planning can expect groundwater levels to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications and other seasonal and annual factors.

D.2. Use of Report

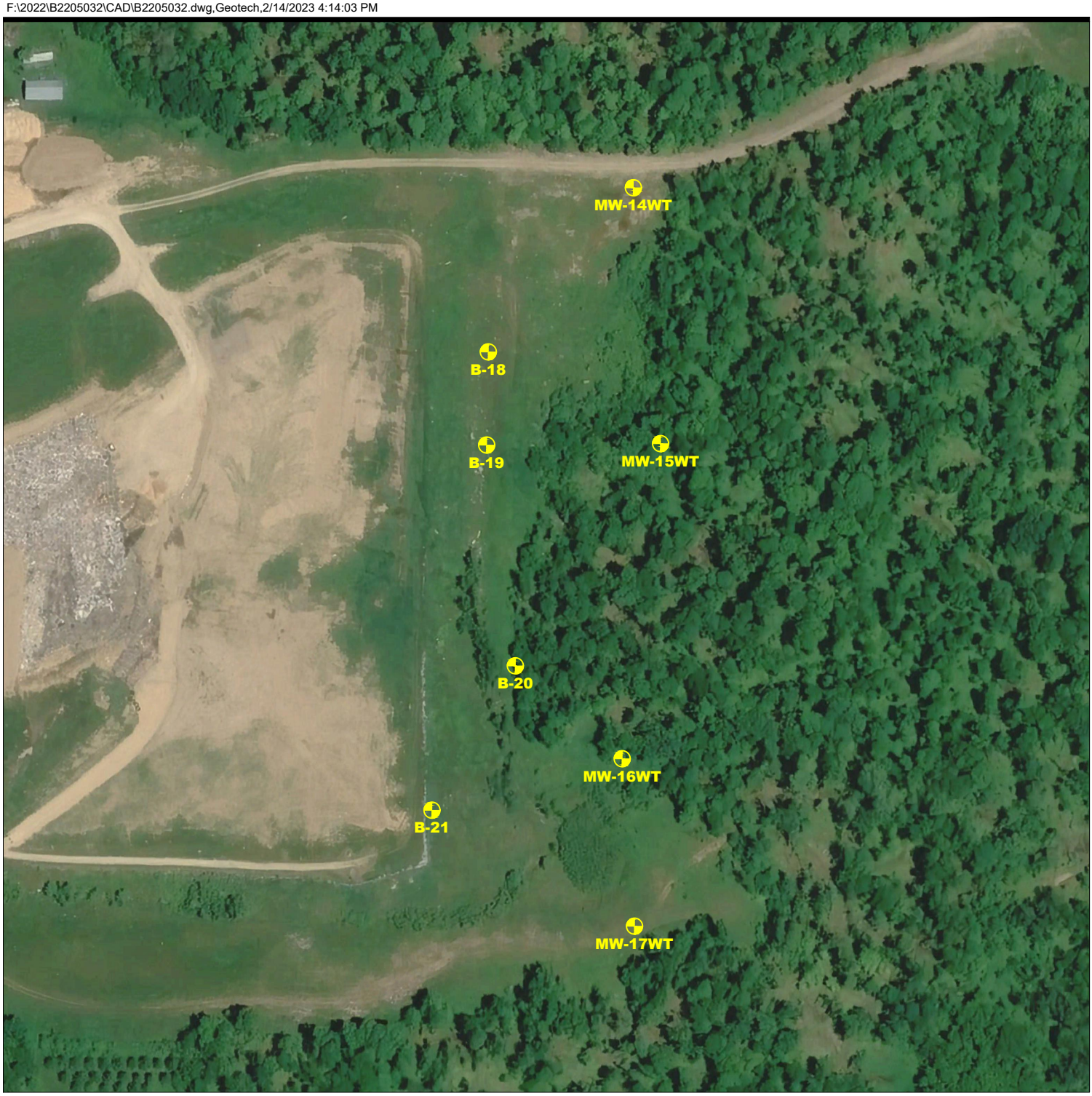
This report is for the exclusive use of the addressed parties. Without written approval, we assume no responsibility to other parties regarding this report. The included information may not be appropriate for other parties or projects.

D.3. Standard of Care

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

Appendix A

F:\2022\B2205032\CAD\B2205032.dwg,Geotech,2/14/2023 4:14:03 PM



DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

N

100' 0 200'

SCALE: 1"= 200'

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11001 Hampshire Avenue S
Minneapolis, MN 55438
952.995.2000
braunintertec.com

Project No:	B2205032
Drawing No:	B2205032
Drawn By:	JAG
Date Drawn:	2/14/23
Checked By:	BW
Last Modified:	2/14/23

Vernon County Landfill Upgrades

53705 County Road LF

Viroqua, Wisconsin

Soil Boring Location Sketch

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **B-18**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164513 EASTING: 715479
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/19/22 END DATE: 09/19/22
SURFACE ELEVATION: 1239.0 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1238.0		LEAN CLAY with SAND (CL), trace roots, brown, moist (TOPSOIL FILL)				20	LL=38, PL=19, PI=19
1.0		FILL: FAT CLAY (CH), orangish brown to tan, moist		2-3-4 (7) 7"		27	LL=64, PL=24, PI=40
1234.5							
4.5		FILL: SANDY FAT CLAY (CH), medium-grained, trace Gravel, orangish brown, moist	5	2-3-3 (6) 8"		27	LL=51, PL=19, PI=32
1232.5							
6.5		FILL: POORLY GRADED SAND (SP), fine to medium-grained, orangish brown, moist		3-7-8 (15) 14"		10	
1230.0							
9.0		FILL: CLAYEY SAND (SC), orangish brown with black, moist	10	2-7-9 (16) 14"		15	LL=39, PL=15, PI=24
1227.5							
11.5		FILL: FAT CLAY with SAND (CH), brown and reddish brown, moist		6-6-5 (11) 16"		27	LL=72, PL=23, PI=49
1225.5							
13.5		CLAYEY SAND (SC), brown, moist, very stiff (ALLUVIUM)	15	5-8-8 (16) 16"		20	
1222.5							
16.5		FAT CLAY (CH), trace Gravel, reddish brown, moist, stiff (RESIDUUM)		3-3-12 (15) 12"		16	
			20	14-12-10 (22) 14"			
1216.0							
23.0		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split-spoon sampler.	25	24-50/5" (REF) 12"			
			30				No recovery
1208.0							
31.0		END OF BORING		50/1" (REF)			Water not observed while drilling.
		Boring then grouted					

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **B-19**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164380 EASTING: 715477
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/19/22 END DATE: 09/19/22
SURFACE ELEVATION: 1233.3 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1232.3		FAT CLAY with SAND (CH), brown, moist (TOPSOIL FILL)					LL=50, PL=17, PI=33
1.0		FILL: SANDY FAT CLAY with GRAVEL (CH), grayish brown, moist		4-7-4 (11) 10"		16	LL=52, PL=19, PI=33
1229.3							
4.0		FILL: SANDY FAT CLAY (CH), brown and red, moist	5	2-3-2 (5) 10"		44	
				4-2-2 (4) 12"		53	
			10	2-2-2 (4) 14"		54	
1221.8							
11.5		FILL: CLAYEY GRAVEL (GC), fine to coarse-grained, dark brown and gray, moist		1-2-1 (3) 6"		33	
			15	1-1-1 (2) 8"		40	
1216.8							
16.5		FILL: FAT CLAY (CH), dark brown, moist		1-1-2 (3) 14"		57	LL=105, PL=34, PI=71
			20	0-1-5 (6) 6"		57	
1210.3							
23.0		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as 'Silty Sand (SM)' in our split-spoon sampler.	25	50/4" (REF) 4"			
			30				
1202.3							
31.0		END OF BORING Boring then grouted		50/1" (REF)			Water not observed while drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **B-20**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164064 EASTING: 715518
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/19/22 END DATE: 09/19/22
SURFACE ELEVATION: 1215.8 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1214.8		SANDY FAT CLAY (CH), trace roots, dark brown, moist (TOPSOIL FILL)					LL=58, PL=16, PI=42
1.0		FILL: LEAN CLAY with GRAVEL (CL), brown, moist		10-4-5 (9) 12"		19	
			5	3-4-6 (10) 12"		27	
1209.3							
6.5		FILL: SANDY FAT CLAY (CH), brown, moist		2-3-6 (9) 12"		33	
1206.8							
9.0		FILL: CLAYEY SAND with GRAVEL (SC), dark brown and black, moist	10	2-12-11 (23) 12"		15	
1204.3							
11.5		FILL: SANDY FAT CLAY (CH), dark brown and gray, moist		3-4-5 (9) 12"		30	
			15	2-1-2 (3) 14"		46	
1199.3							
16.5		FILL: SANDY FAT CLAY (CH), reddish brown and black, moist		5-4-4 (8) 16"		39	
			20	4-7-10 (17) 16"			
1194.8							
21.0		POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, tan, moist, medium dense (RESIDUUM)					
1192.8							
23.0		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split-spoon sampler.	25	50/3" (REF) 3"			
			30	14-18-50/5" (REF) 10"			
1184.8							
31.0		END OF BORING Boring then grouted					Water not observed while drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **B-21**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163857 EASTING: 715398
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/19/22 END DATE: 09/19/22
SURFACE ELEVATION: 1226.1 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1224.9		FAT CLAY with SAND (CH), trace roots, dark brown, moist (TOPSOIL FILL)					LL=67, PL=19, PI=48
1.3		FILL: FAT CLAY with SAND (CH), trace roots, brown, moist		2-2-3 (5) 8"		24	LL=50, PL=16, PI=34
1222.1							
4.0		FILL: FAT CLAY (CH), medium to coarse-grained, trace Gravel, brown, moist	5	1-1-2 (3) 8"		25	
1219.6							
6.5		FILL: SANDY SILT (ML), trace roots, dark brown, moist		1-4-8 (12) 12"		19	
1217.1							
9.0		FILL: LEAN CLAY (CL), trace Gravel, dark brown, moist	10	3-6-7 (13) 12"		17	LL=36, PL=18, PI=18
1214.6							
11.5		FILL: LEAN CLAY (CL), trace organic, dark brown, moist		3-7-8 (15) 14"		19	LL=36, PL=22, PI=14
1211.6							
14.5		FILL: LEAN CLAY (CL), trace Sand, brown, moist	15	2-3-5 (8) 10"		20	
				4-6-9 (15) 14"		18	LL=36, PL=18, PI=18
			20	5-5-7 (12) 12"		19	LL=40, PL=19, PI=21
1203.1							
23.0		FILL: LEAN CLAY (CL), gray to brown, moist	25	9-7-8 (15) 12"		19	
			30	4-6-10 (16) 14"		18	LL=33, PL=20, PI=13
1195.1							
31.0		END OF BORING Boring then grouted					Water not observed while drilling.

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Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-14WT**
LOCATION: See attached sketch. Offset 5 feet
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164748 EASTING: 715687
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/26/22 END DATE: 08/26/22
SURFACE ELEVATION: 1247.2 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1246.2		LEAN CLAY (CL), fine to medium-grained, brown, moist (TOPSOIL FILL)					
1.0		FILL: LEAN CLAY (CL), brown, moist		3-6-7 (13) 18"			
1243.2							
4.0		FILL: CLAYEY SAND (SC), brown, moist	5	4-7-7 (14) 18"			
1240.6							
6.5		FILL: SANDY FAT CLAY (CH), fine to coarse-grained, brownish red, moist		4-3-6 (9) 18"		37	LL=64, PL=42, PI=22
			10	8-6-11 (17) 6"			
1235.6							
11.5		FILL: SILTY CLAY (CL-ML), fine to medium-grained, light gray, moist		3-4-8 (12) 16"			
1233.2							
14.0		FILL: LEAN CLAY (CL), reddish brown, moist	15	3-5-6 (11) 16"			
1230.6							
16.5		FILL: CLAYEY SAND (SC), brown, moist		14-12-8 (20) 18"			
1228.2							
19.0		SILTY SAND (SM), orangish brown, moist, medium dense (ALLUVIUM)	20	6-8-12 (20) 18"			
1224.2							
23.0		LEAN CLAY (CL), fine to coarse-grained, brown, moist, very stiff (RESIDUUM)	25	4-9-11 (20) 16"			Groundwater not observed above mud rotary drilling depth
			30	10-50/4" (REF)			Began mud rotary drilling at 30 feet

Continued on next page

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Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-14WT**
LOCATION: See attached sketch. Offset 5 feet
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164748 EASTING: 715687
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/26/22 END DATE: 08/26/22
SURFACE ELEVATION: 1247.2 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		LEAN CLAY (CL), fine to coarse-grained, brown, moist, very stiff (RESIDUUM)	35	50/0" (REF)			No Recovery
1210.2 37.0		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, highly weathered to decomposed, moderately hard	40	8 / 44	1 9 15 10 10		Run 1
1205.6 41.5		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, retrieved as "Silty Sand (SM)" in our split-spoon sampler	45 50	50/0" (REF) 50/5" (REF)			
1196.6 50.5		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, slightly weathered, moderately hard to hard	55 60	2" / 16 / 30	1 1 1 1 2 1 3 3		Run 2
1186.6 60.5		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, slightly weathered, moderately hard to hard	65		1 1 8 6 1 4 5		Run 3

Continued on next page

RQD % | Recovery % | Drilling Rate (min/ft) | Bit Pressure (psi) | Water Pressure (psi) | Water Return % | Remarks

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LOG OF CORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-14WT**
LOCATION: See attached sketch. Offset 5 feet
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164748 EASTING: 715687
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/26/22 END DATE: 08/26/22
SURFACE ELEVATION: 1247.2 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	RQD %	Recovery %	Drilling Rate (min/ft)	Bit Pressure (psi)	Water Pressure (psi)	Water Return %	Remarks
1178.6						10				
68.5		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, slightly weathered, moderately hard to hard				2				Run 4
70		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, slightly weathered, moderately hard to hard								Core barrel jammed at 68 1/2 feet. Stepped out 5 feet, drilled to 68 feet and continued mud rotary drilling
75										
80										
85										
90										Permanent monitoring well installed with screen set from 90 to 105 feet
95										
100										

Continued on next page

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LOG OF CORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-14WT**
LOCATION: See attached sketch. Offset 5 feet
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164748 EASTING: 715687
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/26/22 END DATE: 08/26/22
SURFACE ELEVATION: 1247.2 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	RQD %	Recovery %	Drilling Rate (min/ft)	Bit Pressure (psi)	Water Pressure (psi)	Water Return %	Remarks
		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, slightly weathered, moderately hard to hard								
1138.2										
109.0		END OF CORING								Water observed at 100.7 feet while drilling. Water observed at 100.0 feet when rechecked 24 hours after drilling.

105
110
115
120
125
130
135

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-15WT**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164382 EASTING: 715726
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/26/22 END DATE: 09/26/22
SURFACE ELEVATION: 1220.6 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1219.6		CLAYEY SAND (SC), trace roots, brown, moist (TOPSOIL FILL)					
1.0		FILL: SANDY LEAN CLAY (CL), trace Gravel, orangish brown, moist		5-7-6 (13) 14"			
			5	6-5-6 (11) 4"			
1214.6							
6.0		FILL: FAT CLAY (CH), with Sand Layers, orangish brown, moist		5-4-5 (9) 16"			
1211.6							
9.0		FILL: CLAYEY SAND (SC), brown, moist	10	6-6-22 (28) 14"			
1209.1							
11.5		FILL: FAT CLAY (CH), with Clayey Sand Layers, dark brown to reddish brown, moist		3-4-5 (9) 14"			
			15	3-3-4 (7) 16"			Groundwater not observed above mud rotary depth
				2-4-4 (8) 18"		46	LL=109, PL=73, PI=36
1200.6			20	2-4-6 (10) 18"			Began mud rotary drilling at 20 feet
20.0		SANDY FAT CLAY (CH), with Poorly Graded Sand layers, brown, moist, stiff (ALLUVIUM)					
1198.1							
22.5		FAT CLAY (CH), trace Gravel, dark brown, moist, stiff to very stiff (ALLUVIUM)					
			25	2-6-9 (15) 16"			
			30	9-8-4 (12) 16"			

Continued on next page

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-15WT**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164382 EASTING: 715726
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/26/22 END DATE: 09/26/22
SURFACE ELEVATION: 1220.6 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		FAT CLAY (CH), trace Gravel, dark brown, moist, stiff to very stiff (ALLUVIUM)	35	2-1-1 (2) 14"			
1182.6							
38.0		SANDY SILT (ML), with Clay seams, tan to gray, moist, very dense (RESIDUUM)	40	38-17-50/4" (REF) 12"			
			45	10-15-50/2" (REF) 14"			
1173.1							
47.5		SILTY SAND (SM), fine to medium-grained, orangish brown, moist, very dense (RESIDUUM)	50	25-45-50/2" (REF) 12"			
			55				
			60	32-27-24 (51) 14"			
1158.1							
62.5		CLAYEY SAND (SC), orangish brown, moist, stiff (RESIDUUM)	65	6-5-10 (15) 14"			
1153.1		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split-spoon sampler.					
67.5							

Continued on next page

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-15WT**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164382 EASTING: 715726
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/26/22 END DATE: 09/26/22
SURFACE ELEVATION: 1220.6 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split-spoon sampler.					
70			M	50/2" (REF) 2"			Permanent monitoring well installed with screen set from 73 to 83 feet
75							
80							
85							
90							
95							
1121.6							
99.0		END OF BORING					Water not observed while drilling.
100							

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-16**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163940 EASTING: 715674
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/21/22 END DATE: 08/23/22
SURFACE ELEVATION: 1184.8 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Dirt/Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1183.8		LEAN CLAY (CL), brown, moist (TOPSOIL)					
1.0		FILL: LEAN CLAY (CL), brown, moist		2-2-2 (4) 0"			No recovery
			5	1-1-2 (3) 10"			
				2-3-3 (6) 14"			LL=43, PL=21, PI=22
1175.8				TW			
9.0		LEAN CLAY (CL), brown, moist, medium (LOESS)	10	TW		24	LL=37, PL=16, PI=21
				2-3-3 (6) 14"			
1170.8							
14.0		CLAYEY SAND with GRAVEL (SC), fine to coarse-grained, brown and yellow, moist, stiff (ALLUVIUM)	15	8-7-6 (13) 14"			
				4-4-6 (10) 18"			
			20	4-5-6 (11) 18"			
			25	4-4-5 (9) 14"		18	LL=41, PL=24, PI=17
			30	8-7-5 (12) 8"			
1151.8		CLAYEY GRAVEL (GC), fine to coarse-grained, brown, moist, medium dense to very dense (RESIDUUM)					
33.0							

Continued on next page

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-16**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163940 EASTING: 715674
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/21/22 END DATE: 08/23/22
SURFACE ELEVATION: 1184.8 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Dirt/Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		CLAYEY GRAVEL (GC), fine to coarse-grained, brown, moist, medium dense to very dense (RESIDUUM)	35	22-28-30 (58) 8"			
			40	6-15-42 (57)			
			45	5-8-16 (24) 16"			Groundwater not observed above mud rotary depth
1136.8							
48.0		SILTY GRAVEL (GM), fine to coarse-grained, brown, moist to wet, dense to very dense (RESIDUUM)	50	8-10-26 (36) 16"			Began mud rotary drilling at 50 feet Groundwater perched at 50 feet, static at 68 feet
			55	50/5" (REF) 4"			
			60	15-50/5" (REF) 8"			
1120.8							
64.0		CLAYEY SAND with GRAVEL (SC), fine to coarse-grained, tan, wet, stiff (RESIDUUM)	65	35-8-3 (11) 18"			Adjacent well MW-16WT installed screen from 65 to 75 feet
1116.8							
68.0		Continued on next page					

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-16**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163940 EASTING: 715674
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/21/22 END DATE: 08/23/22
SURFACE ELEVATION: 1184.8 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Dirt/Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in split-spoon sampler	70	50/3" (REF) 3"			
			75	3-9-25 (34) 18"			
	▽		80	50/1" (REF) 1"			
			85	50/0" (REF) 0"			
			90	50/4" (REF) 2"			Permanent monitoring well installed with screen set from 92 to 97 feet
			95	50/1" (REF) 1"			
1086.8 98.0		END OF BORING	100				Water not observed while drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-17WT**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163691 EASTING: 715688
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/22/22 END DATE: 09/22/22
SURFACE ELEVATION: 1196.4 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1195.4		SANDY FAT CLAY (CH), trace roots, brown, moist (TOPSOIL FILL)					
1.0		FILL: CLAYEY SAND with GRAVEL (SC), brown, moist		5-9-6 (15) 14"			
			5	10-28-20 (48) 12"		20	LL=59, PL=40, PI=19
1190.4							
6.0		FILL: CLAYEY SAND (SC), trace Gravel, brown, moist		14-10-12 (22) 14"		17	LL=39, PL=27, PI=12
			10	10-10-10 (20) 16"		16	LL=41, PL=29, PI=12
1184.9							
11.5		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, brown, moist		14-14-25 (39) 14"			
			15	24-40-40 (80) 14"			
1179.9							
16.5		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, with thin clay layers, light brown, moist		15-9-10 (19) 16"			
			20	7-14-34 (48) 16"			Began mud rotary drilling at 20 feet
			25	12-14-16 (30) 16"			
1167.9							
28.5		SILTY SAND (SM), fine to medium-grained, orangish brown, moist, medium dense (ALLUVIUM)	30	4-5-11 (16) 14"			

Continued on next page

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-17WT**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163691 EASTING: 715688
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/22/22 END DATE: 09/22/22
SURFACE ELEVATION: 1196.4 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		SILTY SAND (SM), fine to medium-grained, orangish brown, moist, medium dense (ALLUVIUM)	35	10-15-32 (47) 14"			
1158.9							
37.5		CLAYEY SAND (SC), with Silt, brown, moist, stiff (ALLUVIUM)	40	8-6-6 (12) 12"			
1153.4							
43.0		SANDY SILT (ML), brown, moist, very dense (RESIDUUM)	45	35-50/2" (REF) 6"			
1148.4							
48.0		SANDY SILT (ML), fine to medium-grained, brown, moist, medium dense (RESIDUUM)	50	10-10-17 (27) 12"			
			55	10-14-16 (30) 12"			
			60	14-10-10 (20) 10"			
1133.4							
63.0		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split-spoon sampler.	65	50/1" (REF) 1"			

Continued on next page

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-17WT**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163691 EASTING: 715688

DRILLER:	E. Rislov	LOGGED BY:	T. Felker	START DATE:	09/22/22
SURFACE ELEVATION:	1196.4 ft	RIG: 8505	METHOD: 3 1/4" HSA	SURFACING:	Grass
END DATE:	09/22/22	WEATHER:	Sunny		

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split-spoon sampler.					
	▽						Permanent monitoring well installed with screen set from 77 to 87 feet
1103.4 93.0		END OF BORING					

70 75 80 85 90 95 100

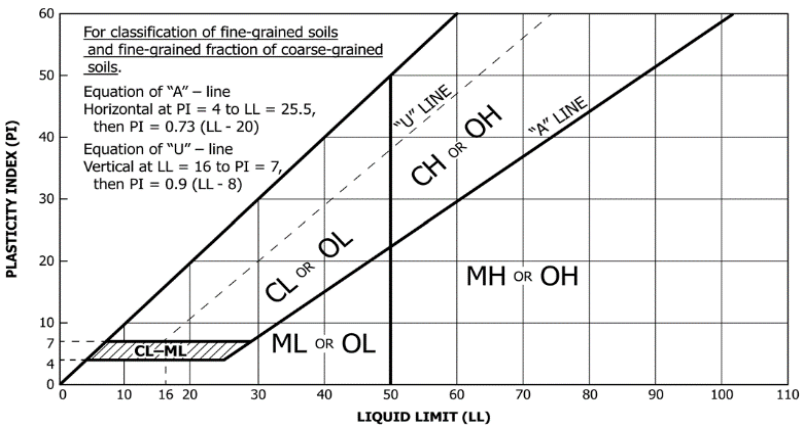
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Descriptive Terminology of Soil

Based on Standards ASTM D2487/2488
(Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
				Group Symbol	Group Name[B]
Coarse-grained Soils (more than 50% retained on No. 200 sieve)	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5% fines[C])	$C_u \geq 4$ and $1 \leq C_c \leq 3$[D]	GW	Well-graded gravel[E]
			$C_u < 4$ and/or ($C_c < 1$ or $C_c > 3$)[D]	GP	Poorly graded gravel[E]
		Gravels with Fines (More than 12% fines[C])	Fines classify as ML or MH	GM	Silty gravel[E F G]
			Fines Classify as CL or CH	GC	Clayey gravel[E F G]
	Sands (50% or more coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% fines[H])	$C_u \geq 6$ and $1 \leq C_c \leq 3$[D]	SW	Well-graded sand[I]
			$C_u < 6$ and/or ($C_c < 1$ or $C_c > 3$)[D]	SP	Poorly graded sand[I]
		Sands with Fines (More than 12% fines[H])	Fines classify as ML or MH	SM	Silty sand[F G I]
			Fines classify as CL or CH	SC	Clayey sand[F G I]
Fine-grained Soils (50% or more passes the No. 200 sieve)	Silts and Clays (Liquid limit less than 50)	Inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean clay[K L M]
			PI < 4 or plots below "A" line[J]	ML	Silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OL	Organic clay[K L M N] / Organic silt[K L M O]
	Silts and Clays (Liquid limit 50 or more)	Inorganic	PI plots on or above "A" line	CH	Fat clay[K L M]
			PI plots below "A" line	MH	Elastic silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OH	Organic clay[K L M P] / Organic silt[K L M Q]
Highly Organic Soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

A. Based on the material passing the 3-inch (75-mm) sieve.
B. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
C. Gravels with 5 to 12% fines require dual symbols:
   GW-GM well-graded gravel with silt
   GW-GC well-graded gravel with clay
   GP-GM poorly graded gravel with silt
   GP-GC poorly graded gravel with clay
D. $C_u = D_{60} / D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
E. If soil contains ≥ 15% sand, add "with sand" to group name.
F. If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
G. If fines are organic, add "with organic fines" to group name.
H. Sands with 5 to 12% fines require dual symbols:
   SW-SM well-graded sand with silt
   SW-SC well-graded sand with clay
   SP-SM poorly graded sand with silt
   SP-SC poorly graded sand with clay
I. If soil contains ≥ 15% gravel, add "with gravel" to group name.
J. If Atterberg limits plot in hatched area, soil is CL-ML, silty clay.
K. If soil contains 15 to < 30% plus No. 200, add "with sand" or "with gravel", whichever is predominant.
L. If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.
M. If soil contains ≥ 30% plus No. 200 predominantly gravel, add "gravelly" to group name.
N. PI ≥ 4 and plots on or above "A" line.
O. PI < 4 or plots below "A" line.
P. PI plots on or above "A" line.
Q. PI plots below "A" line.



Particle Size Identification

Boulders..... over 12"
Cobbles..... 3" to 12"
Gravel
  Coarse..... 3/4" to 3" (19.00 mm to 75.00 mm)
  Fine..... No. 4 to 3/4" (4.75 mm to 19.00 mm)
Sand
  Coarse..... No. 10 to No. 4 (2.00 mm to 4.75 mm)
  Medium..... No. 40 to No. 10 (0.425 mm to 2.00 mm)
  Fine..... No. 200 to No. 40 (0.075 mm to 0.425 mm)
Silt..... No. 200 (0.075 mm) to .005 mm
Clay..... < .005 mm

Relative Proportions[L, M]

trace..... 0 to 5%
little..... 6 to 14%
with..... ≥ 15%

Inclusion Thicknesses

lens..... 0 to 1/8"
seam..... 1/8" to 1"
layer..... over 1"

Apparent Relative Density of Cohesionless Soils

Very loose ..... 0 to 4 BPF
Loose ..... 5 to 10 BPF
Medium dense..... 11 to 30 BPF
Dense..... 31 to 50 BPF
Very dense..... over 50 BPF

Consistency of Cohesive Soils	Blows Per Foot	Approximate Unconfined Compressive Strength
Very soft	0 to 1 BPF	< 0.25 tsf
Soft	2 to 4 BPF	0.25 to 0.5 tsf
Medium	5 to 8 BPF	0.5 to 1 tsf
Stiff	9 to 15 BPF	1 to 2 tsf
Very Stiff	16 to 30 BPF	2 to 4 tsf
Hard	over 30 BPF	> 4 tsf

Moisture Content:

Dry: Absence of moisture, dusty, dry to the touch.
Moist: Damp but no visible water.
Wet: Visible free water, usually soil is below water table.

Drilling Notes:

Blows/N-value: Blows indicate the driving resistance recorded for each 6-inch interval. The reported N-value is the blows per foot recorded by summing the second and third interval in accordance with the Standard Penetration Test, ASTM D1586.

Partial Penetration: If the sampler could not be driven through a full 6-inch interval, the number of blows for that partial penetration is shown as #/x" (i.e. 50/2"). The N-value is reported as "REF" indicating refusal.

Recovery: Indicates the inches of sample recovered from the sampled interval. For a standard penetration test, full recovery is 18", and is 24" for a thinwall/shelby tube sample.

WOH: Indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WOR: Indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

Water Level: Indicates the water level measured by the drillers either while drilling (▽), at the end of drilling (▼), or at some time after drilling (▼).

Laboratory Tests

DD	Dry density, pcf	**OC**	Organic content, %	**LL**	Liquid limit
WD	Wet density, pcf	**q_p**	Pocket penetrometer strength, tsf	**PL**	Plastic limit
P200	% Passing #200 sieve	**MC**	Moisture content, %	**PI**	Plasticity index
		q_U	Unconfined compression test, tsf		

Appendix B

BRAUN INTERTEC
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Geotechnical Testing

Various ASTM

12/14/2022

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Metafield ID: 498857
Sampled By: Drill Crew
Sample Date: 11/29/2022
Received Date: 12/14/2022
Lab: 11001 Hampshire Ave S, Bloomington, MN
Completed Date: 12/14/2022
Tested By: Seokaran, Kanhai

Laboratory Results Summary

Boring	Sample	Depth (ft)	MC (%)	Wash Loss (%)	LL	PL	PI	Organic Content %	Dry Density (pcf)	Resistivity (ohm-cm)	Q_u (tsf)	Specific Gravity
B-18		7.0	10.3									
B-18		14.5	19.5									
B-18		17.0	15.9									
B-19		4.5	43.8									
B-19		7.0	52.5									
B-19		9.5	54.0									
B-19		12.0	33.4									
B-19		14.5	39.9									
B-19		19.5	57.2									
B-20		2.0	19.2									
B-20		4.5	27.1									
B-20		7.0	33.3									
B-20		9.5	15.0									
B-20		12.0	30.0									
B-20		14.5	46.1									
B-20		17.0	39.3									
B-21		4.5	25.4									
B-21		7.0	18.6									
B-21		14.5	20.2									
B-21		24.5	18.9									
MW-16	TW	10.0			37	21	16					
B-19		0.0			50	17	33					
B-21		0.0			67	19	48					

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11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Geotechnical Testing

Various ASTM

12/14/2022

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Boring	Sample	Depth (ft)	MC (%)	Wash Loss (%)	LL	PL	PI	Organic Content %	Dry Density (pcf)	Resistivity (ohm-cm)	Q_u (tsf)	Specific Gravity
MW-16	TW	7.0			43	22	21					
B-19		17.0			105	34	71					
B-20	Bulk	0.0			58	16	42					
B-21		2.0			50	16	34					
B-21		9.5			36	18	18					
B-21		12.0			36	22	14					
B-21		17.0			36	18	18					
B-21		19.5			40	19	21					
B-21		29.5			33	20	13					
MW-14WT		7.0			64	22	42					
MW-15WT		17.0			109	36	73					
MW-16		24.5			41	17	24					
MW-17WT		4.5			59	19	40					
MW-17WT		7.0			39	12	27					
MW-17WT		9.5			41	12	29					
B-18		0.0			38	19	19					
B-18		2.0			64	24	40					
B-18		4.5			51	19	32					
B-18		9.5			39	15	24					
B-18		12.0			72	23	49					
B-19		2.0			52	19	33					

General

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Geotechnical Testing

Various ASTM

12/16/2022

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Metafield ID: 499072

Completed Date: 12/16/2022 **Prepared By:** Streier, Jim

Laboratory Results Summary

Boring	Sample	Depth (ft)	MC (%)	Wash Loss (%)	LL	PL	PI	Organic Content %	Dry Density (pcf)	Resistivity (ohm-cm)	Q_u (tsf)	Specific Gravity
MW-14WT		7.0	36.8									
MW-15WT		17.0	46.0									
MW-16		10.0	24.2									
MW-16		24.5	18.0									
MW-17WT		4.5	19.8									
MW-17WT		7.0	16.8									
MW-17WT		9.5	15.9									
B-18		0.0	19.5									
B-18		2.0	27.1									
B-18		4.5	26.7									
B-18		9.5	15.4									
B-18		12.0	26.5									
B-19		2.0	15.8									
B-19		17.0	57.4									
B-21		2.0	24.2									
B-21		9.5	17.0									
B-21		12.0	18.5									
B-21		17.0	17.9									
B-21		19.5	19.0									
B-21		29.5	18.2									

General

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Geotechnical Testing

Various ASTM

12/16/2022

Client:	**Project:**
Vernon County Solid Waste & Recycling Department S3705 County Road LF Viroqua, WI 54665	B2205032 Vernon County Landfill S3705 County Road LF Viroqua, WI 54665

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Atterberg Limits

ASTM D4318

Report Date: 07/03/2023

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11001 Hampshire Avenue S
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Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522626	**Sampled By:**	Wright, Brandon
Sampling Method:	Project Specified	**Depth (ft):**	0-2
Boring Number:	B-19		
Location Details:	B-19		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/06/2023	**Tested By:**	Streier, Jim

Laboratory Data

Description	Result	Specifications
Liquid Limit:	51	-
Plastic Limit:	18	
Plastic Index:	33	-
Soil Classification:	CH Fat Clay	

General

Results: The test is for informational purposes.

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Atterberg Limits

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Report Date: 07/03/2023

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Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522628	**Sampled By:**	Wright, Brandon
Sampling Method:	Project Specified	**Depth (ft):**	0-2
Boring Number:	B-20		
Location Details:	B-20		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/06/2023	**Tested By:**	Streier, Jim

Laboratory Data

Description	Result	Specifications
Liquid Limit:	35	-
Plastic Limit:	23	
Plastic Index:	12	-
Soil Classification:	CL SANDY LEAN CLAY	

General

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Hydrometer And Sieve Analysis

ASTM D422

12/16/2022

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

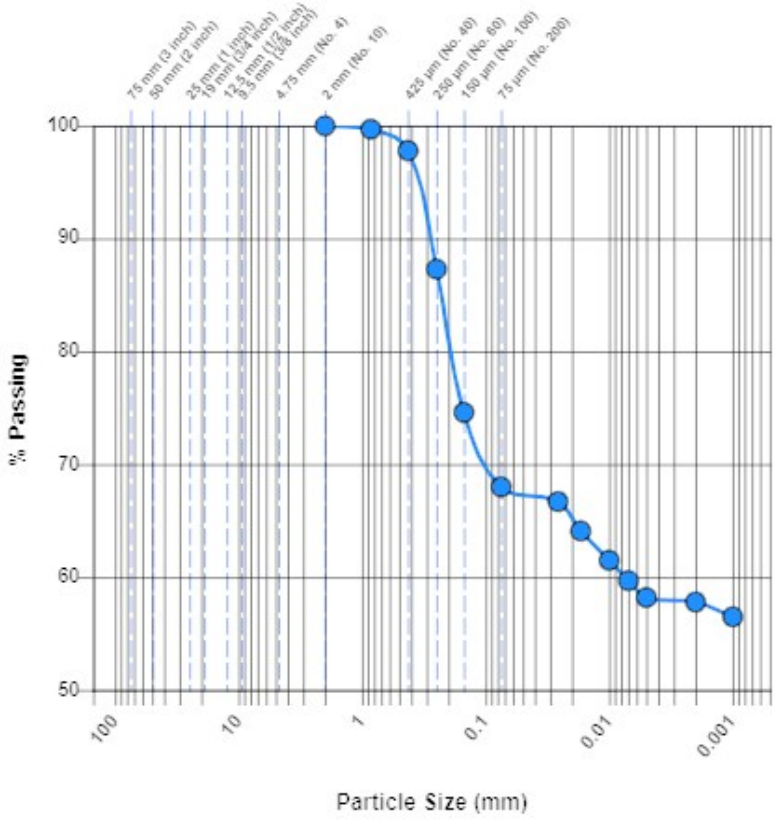
Sample Information

Sample Number:	499074	**Depth (ft):**	7-8.5
Boring Number:	MW-14WT	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.7	-
425 µm (No. 40)	97.8	-
250 µm (No. 60)	87.3	-
150 µm (No. 100)	74.6	-
75 µm (No. 200)	68.0	-
26.2 (µm)	66.7	-
16.7 (µm)	64.1	-
9.7 (µm)	61.5	-
6.9 (µm)	59.7	-
4.9 (µm)	58.2	-
2.4 (µm)	57.8	-
1.0 (µm)	56.5	-



Soil Classification: CH Sandy fat clay

Gravel (%):	0	**Sand (%):**	32.0	**Silt (%):**	9.8	**Clay (%):**	58.2
D_{60} (µm):	7.5						

General

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Hydrometer And Sieve Analysis

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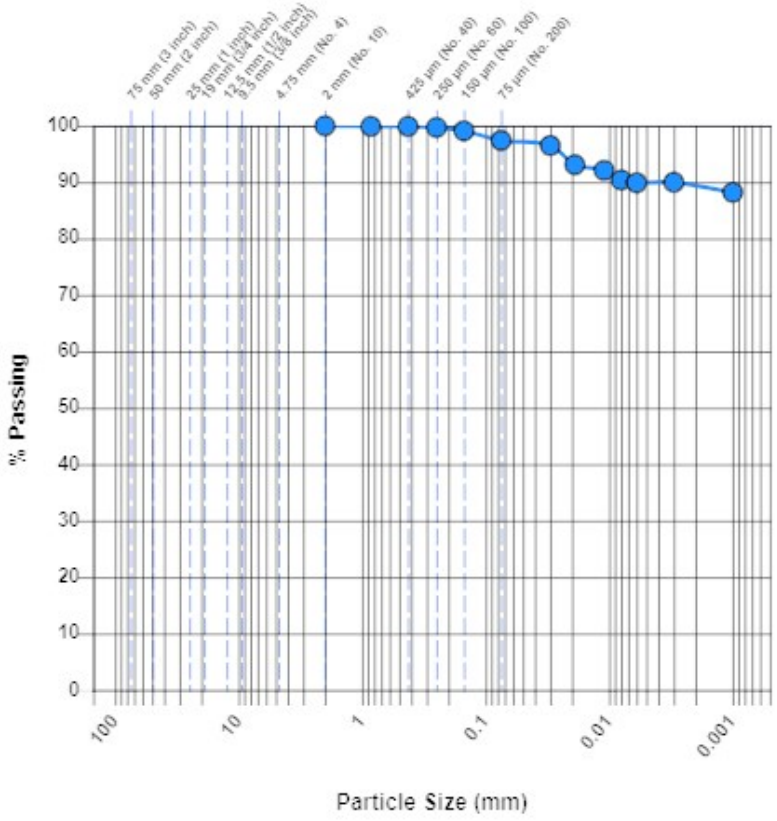
Sample Information

Sample Number:	499075	**Depth (ft):**	17-18.5
Boring Number:	MW-15WT	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.9	-
425 µm (No. 40)	99.9	-
250 µm (No. 60)	99.7	-
150 µm (No. 100)	99.1	-
75 µm (No. 200)	97.4	-
29.8 (µm)	96.5	-
19.0 (µm)	93.1	-
11.0 (µm)	92.1	-
7.8 (µm)	90.4	-
5.5 (µm)	89.9	-
2.7 (µm)	90.0	-
1.2 (µm)	88.2	-



Soil Classification: CH Fat Clay

Gravel (%):	0	**Sand (%):**	2.6	**Silt (%):**	7.5	**Clay (%):**	89.9

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Hydrometer And Sieve Analysis

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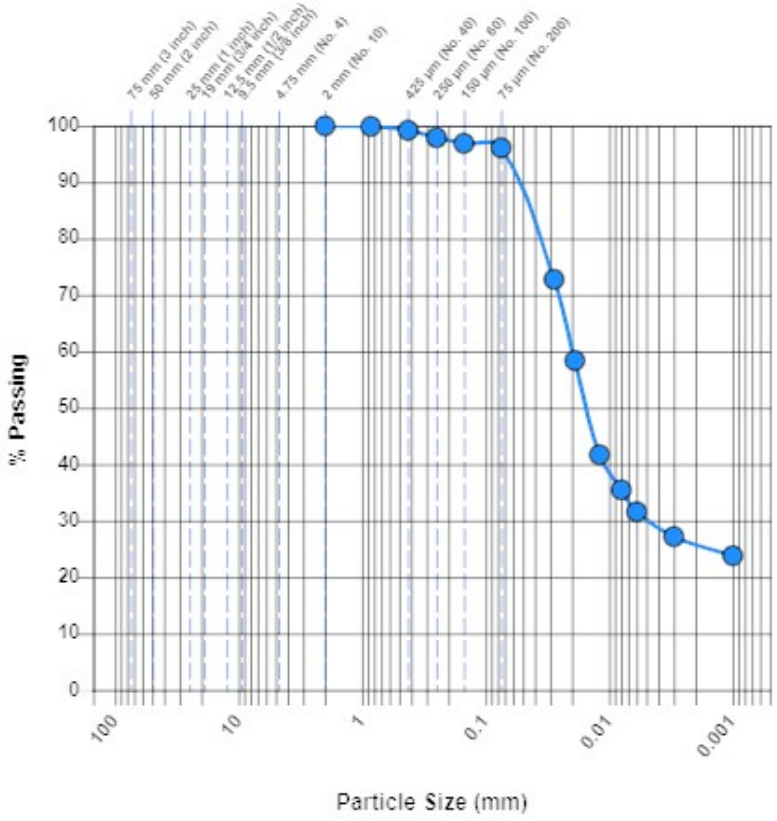
Sample Information

Sample Number:	499076	**Depth (ft):**	10-12
Boring Number:	MW-16	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.9	-
425 µm (No. 40)	99.2	-
250 µm (No. 60)	97.9	-
150 µm (No. 100)	96.9	-
75 µm (No. 200)	96.1	-
28.1 (µm)	72.8	-
18.9 (µm)	58.4	-
11.6 (µm)	41.7	-
8.4 (µm)	35.5	-
6.0 (µm)	31.6	-
3.0 (µm)	27.2	-
1.3 (µm)	23.8	-



Soil Classification: CL Lean clay

Gravel (%):	0	**Sand (%):**	3.9	**Silt (%):**	66.0	**Clay (%):**	30.1
D_{60} (µm):	20.0	**D_{30} (µm):**	4.9				

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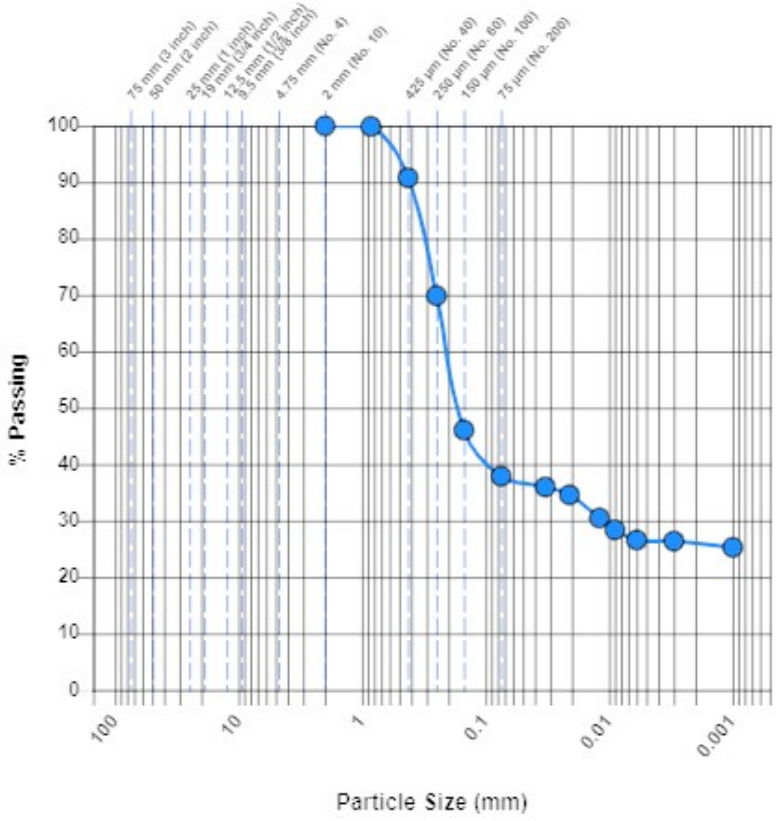
Sample Information

Sample Number:	499077	**Depth (ft):**	24.5-26
Boring Number:	MW-16	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.9	-
425 µm (No. 40)	90.8	-
250 µm (No. 60)	69.9	-
150 µm (No. 100)	46.1	-
75 µm (No. 200)	37.9	-
33.2 (µm)	36.0	-
21.0 (µm)	34.6	-
12.3 (µm)	30.5	-
8.7 (µm)	28.4	-
6.2 (µm)	26.6	-
3.0 (µm)	26.4	-
1.3 (µm)	25.3	-



Soil Classification: SC Clayey sand

Gravel (%):	0	**Sand (%):**	62.1	**Silt (%):**	11.4	**Clay (%):**	26.5
D_{60} (µm):	208.4	**D_{30} (µm):**	11.3				

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Hydrometer And Sieve Analysis

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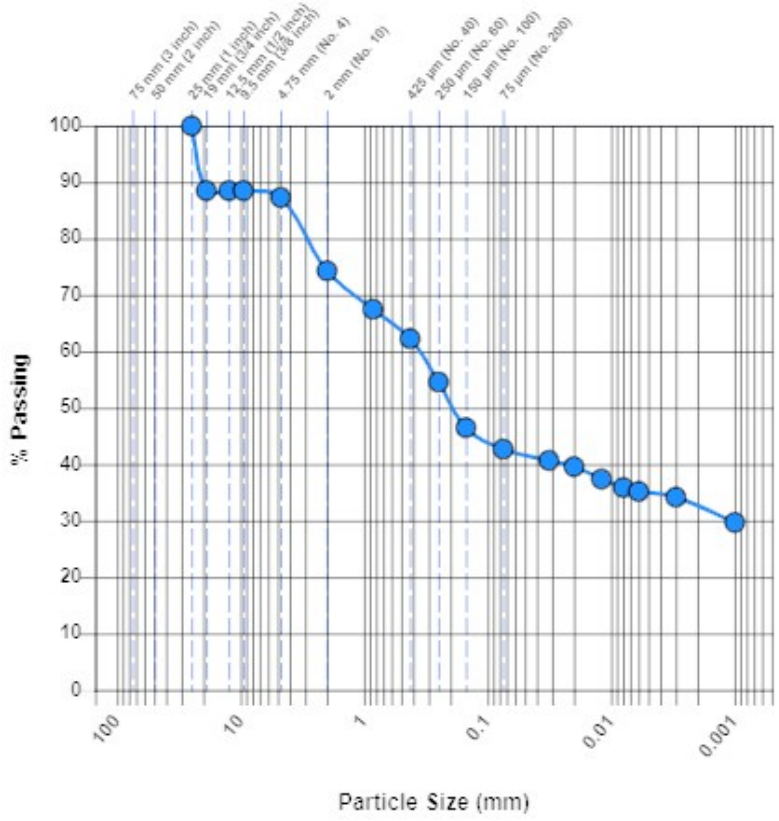
Sample Information

Sample Number:	499079	**Depth (ft):**	4.5-6
Boring Number:	MW-17WT	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
25 mm (1 inch)	100.0	-
19 mm (3/4 inch)	88.5	-
12.5 mm (1/2 inch)	88.5	-
9.5 mm (3/8 inch)	88.5	-
4.75 mm (No. 4)	87.3	-
2 mm (No. 10)	74.3	-
850 µm (No. 20)	67.5	-
425 µm (No. 40)	62.3	-
250 µm (No. 60)	54.6	-
150 µm (No. 100)	46.5	-
75 µm (No. 200)	42.7	-
32.1 (µm)	40.7	-
20.4 (µm)	39.6	-
11.8 (µm)	37.4	-
8.4 (µm)	35.9	-
5.9 (µm)	35.2	-
2.9 (µm)	34.2	-
1.3 (µm)	29.7	-



Soil Classification: SC Clayey sand

Gravel (%):	12.7	**Sand (%):**	44.6	**Silt (%):**	7.8	**Clay (%):**	34.9
D_{60} (µm):	372.7	**D_{30} (µm):**	1.1				

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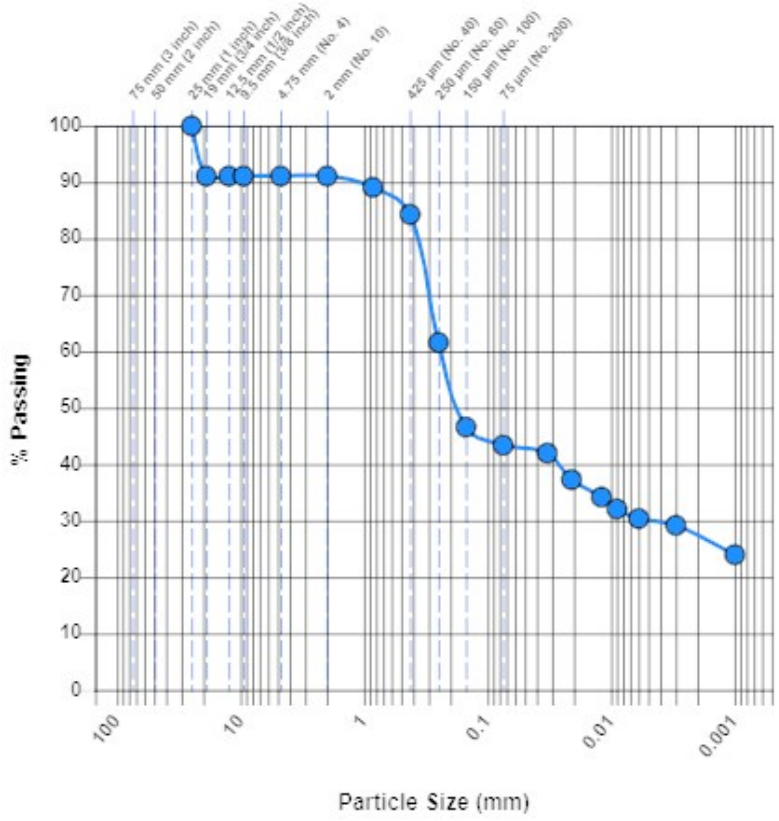
Sample Information

Sample Number:	499080	**Depth (ft):**	7-8.5
Boring Number:	MW-17WT	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
25 mm (1 inch)	100.0	-
19 mm (3/4 inch)	91.1	-
12.5 mm (1/2 inch)	91.1	-
9.5 mm (3/8 inch)	91.1	-
4.75 mm (No. 4)	91.1	-
2 mm (No. 10)	91.1	-
850 µm (No. 20)	89.1	-
425 µm (No. 40)	84.3	-
250 µm (No. 60)	61.6	-
150 µm (No. 100)	46.6	-
75 µm (No. 200)	43.4	-
32.5 (µm)	42.0	-
20.8 (µm)	37.3	-
12.1 (µm)	34.2	-
8.6 (µm)	32.1	-
6.1 (µm)	30.4	-
3.0 (µm)	29.2	-
1.3 (µm)	24.0	-



Soil Classification: SC Clayey sand

Gravel (%):	8.9	**Sand (%):**	47.7	**Silt (%):**	13.4	**Clay (%):**	30.0
D_{60} (µm):	239.3	**D_{30} (µm):**	5.0				

General

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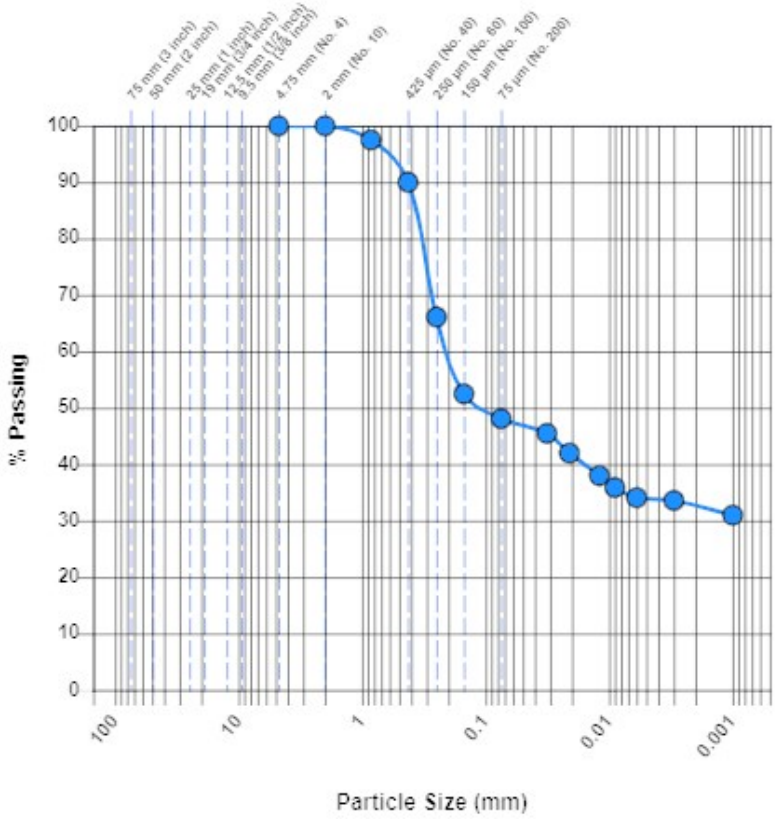
Sample Information

Sample Number:	499082	**Depth (ft):**	9.5-11
Boring Number:	MW-17WT	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
4.75 mm (No. 4)	100.0	-
2 mm (No. 10)	100.0	-
850 µm (No. 20)	97.5	-
425 µm (No. 40)	90.0	-
250 µm (No. 60)	66.1	-
150 µm (No. 100)	52.5	-
75 µm (No. 200)	48.1	-
32.4 (µm)	45.5	-
20.7 (µm)	42.0	-
12.0 (µm)	38.0	-
8.6 (µm)	35.9	-
6.1 (µm)	34.1	-
3.0 (µm)	33.6	-
1.3 (µm)	31.0	-



Soil Classification: SC Clayey sand

Gravel (%):	0.0	**Sand (%):**	51.9	**Silt (%):**	14.2	**Clay (%):**	33.9
D_{60} (µm):	205.1						

General

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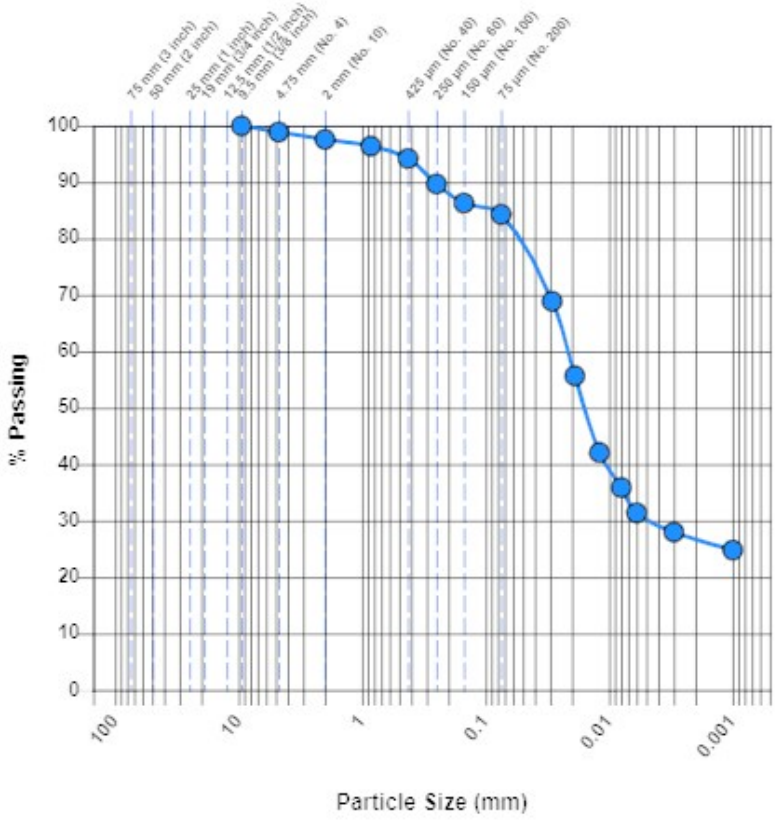
Sample Information

Sample Number:	499084	**Depth (ft):**	0-2
Boring Number:	B-18	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
9.5 mm (3/8 inch)	100.0	-
4.75 mm (No. 4)	98.9	-
2 mm (No. 10)	97.6	-
850 µm (No. 20)	96.4	-
425 µm (No. 40)	94.2	-
250 µm (No. 60)	89.7	-
150 µm (No. 100)	86.3	-
75 µm (No. 200)	84.3	-
29.2 (µm)	68.9	-
19.3 (µm)	55.7	-
11.6 (µm)	42.1	-
8.4 (µm)	35.9	-
6.0 (µm)	31.4	-
3.0 (µm)	28.0	-
1.3 (µm)	24.8	-



Soil Classification: CL Lean clay with sand

Gravel (%):	1.1	**Sand (%):**	14.6	**Silt (%):**	54.0	**Clay (%):**	30.3
D_{60} (µm):	22.3	**D_{30} (µm):**	4.8				

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Hydrometer And Sieve Analysis

ASTM D422

12/16/2022

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

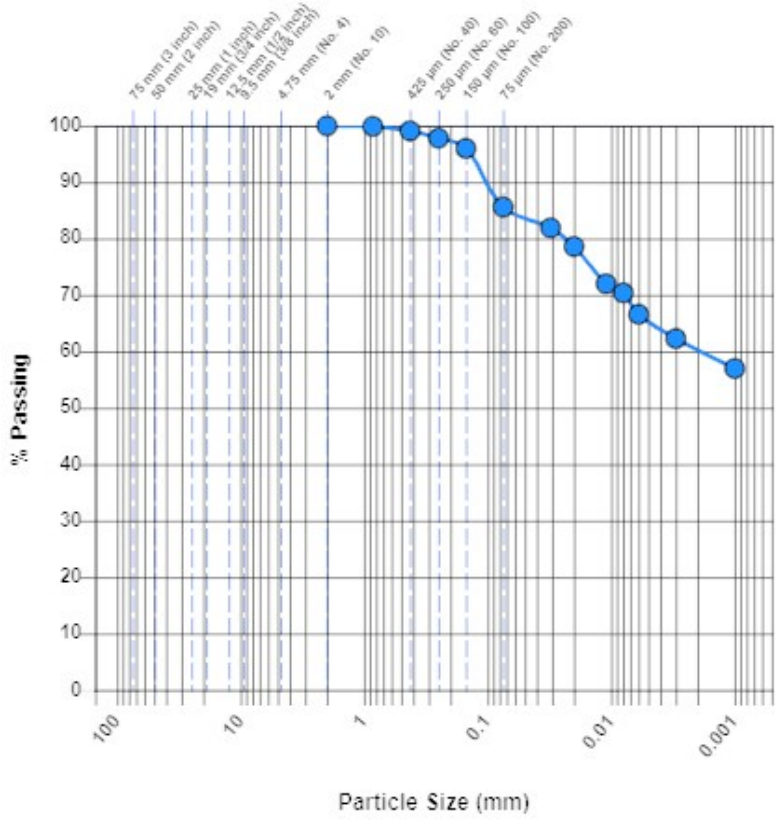
Sample Information

Sample Number:	499085	**Depth (ft):**	2-3.5
Boring Number:	B-18	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.9	-
425 µm (No. 40)	99.1	-
250 µm (No. 60)	97.8	-
150 µm (No. 100)	96.0	-
75 µm (No. 200)	85.6	-
30.6 (µm)	81.9	-
19.5 (µm)	78.6	-
11.4 (µm)	72.0	-
8.1 (µm)	70.4	-
5.7 (µm)	66.6	-
2.8 (µm)	62.3	-
1.3 (µm)	57.0	-



Soil Classification: CH Fat Clay

Gravel (%):	0	**Sand (%):**	14.4	**Silt (%):**	20.4	**Clay (%):**	65.2
D_{60} (µm):	2.1						

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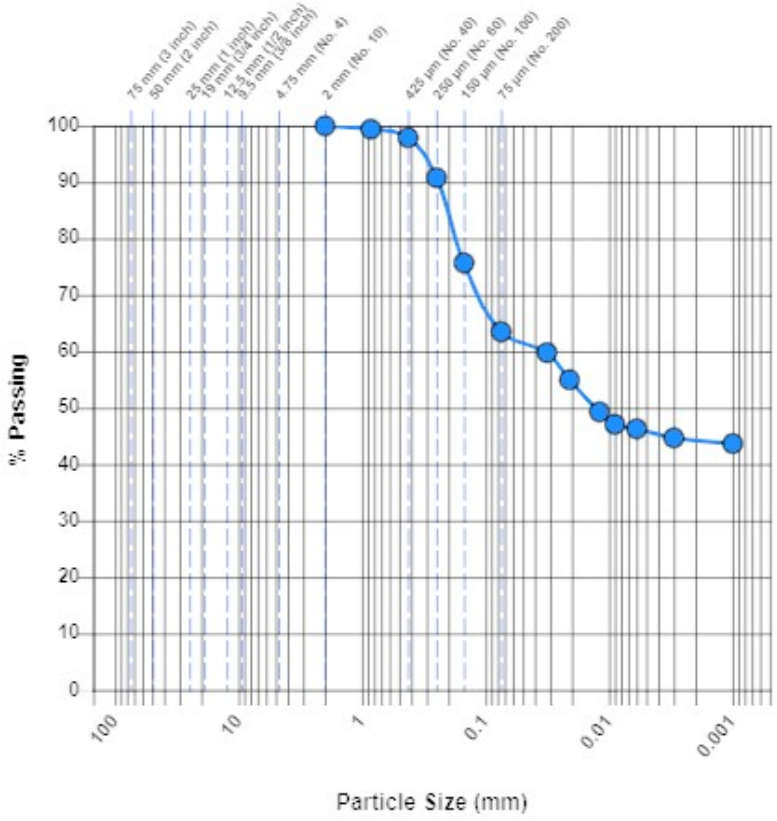
Sample Information

Sample Number:	499086	**Depth (ft):**	4.5-6
Boring Number:	B-18	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.4	-
425 µm (No. 40)	97.9	-
250 µm (No. 60)	90.8	-
150 µm (No. 100)	75.7	-
75 µm (No. 200)	63.5	-
32.4 (µm)	59.8	-
20.7 (µm)	55.0	-
12.1 (µm)	49.3	-
8.6 (µm)	47.1	-
6.0 (µm)	46.3	-
3.0 (µm)	44.7	-
1.3 (µm)	43.7	-



Soil Classification: CH Sandy fat clay

Gravel (%):	0	**Sand (%):**	36.5	**Silt (%):**	17.7	**Clay (%):**	45.8
D_{60} (µm):	34.3						

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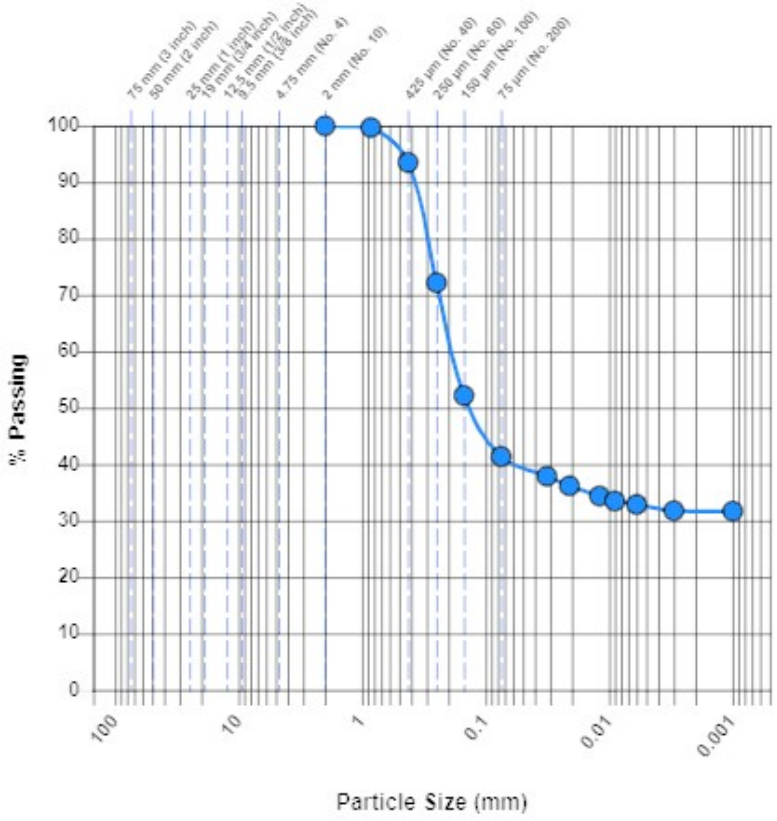
Sample Information

Sample Number:	499088	**Depth (ft):**	9.5-11
Boring Number:	B-18	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.7	-
425 µm (No. 40)	93.5	-
250 µm (No. 60)	72.2	-
150 µm (No. 100)	52.2	-
75 µm (No. 200)	41.4	-
32.3 (µm)	37.9	-
20.6 (µm)	36.2	-
11.9 (µm)	34.4	-
8.5 (µm)	33.5	-
6.0 (µm)	32.9	-
2.9 (µm)	31.8	-
1.3 (µm)	31.7	-



Soil Classification: SC Clayey sand

Gravel (%):	0	**Sand (%):**	58.6	**Silt (%):**	8.9	**Clay (%):**	32.5

D_{60} (µm): 189.0

General

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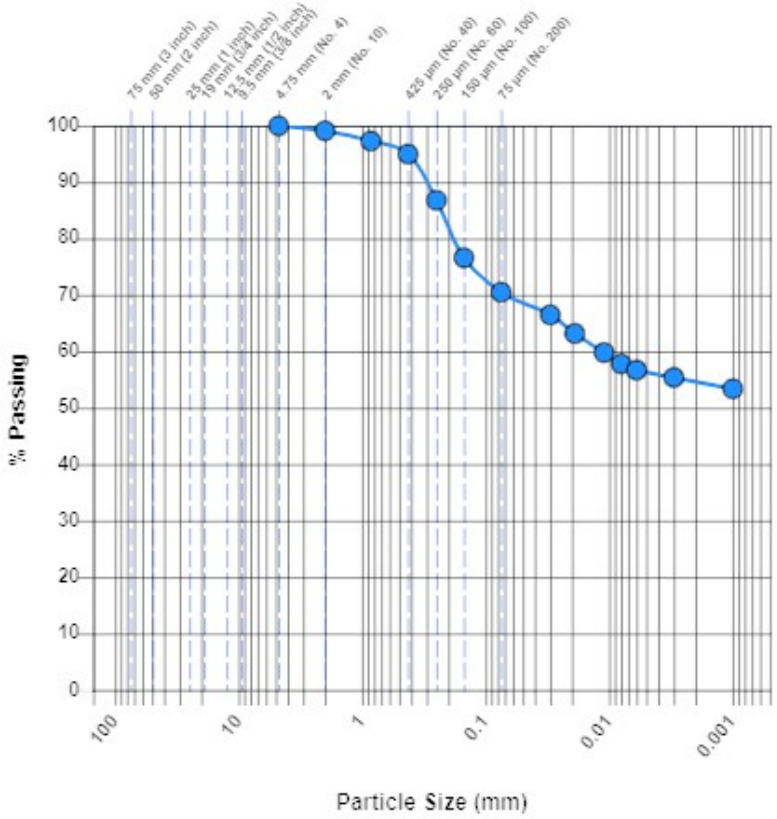
Sample Information

Sample Number:	499090	**Depth (ft):**	12-13.5
Boring Number:	B-18	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
4.75 mm (No. 4)	100.0	-
2 mm (No. 10)	99.1	-
850 µm (No. 20)	97.3	-
425 µm (No. 40)	95.0	-
250 µm (No. 60)	86.8	-
150 µm (No. 100)	76.6	-
75 µm (No. 200)	70.5	-
30.1 (µm)	66.5	-
19.2 (µm)	63.2	-
11.2 (µm)	59.8	-
8.0 (µm)	57.8	-
5.6 (µm)	56.7	-
2.8 (µm)	55.4	-
1.2 (µm)	53.4	-



Soil Classification: CH Fat clay with sand

Gravel (%):	0.0	**Sand (%):**	29.5	**Silt (%):**	14.2	**Clay (%):**	56.3
D_{60} (µm):	11.5						

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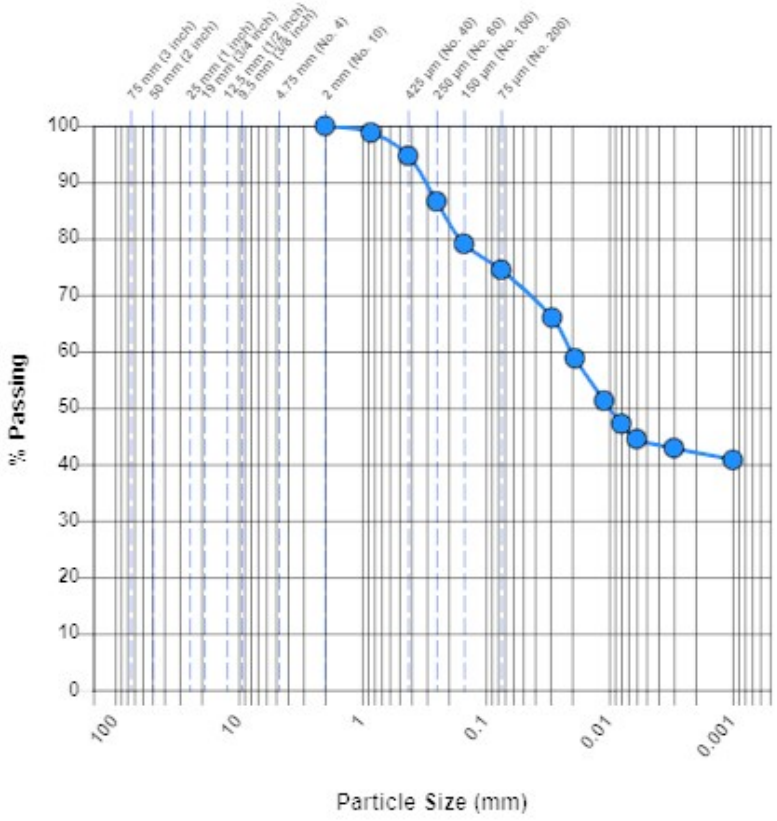
Sample Information

Sample Number:	499091	**Depth (ft):**	0-2
Boring Number:	B-19	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	98.8	-
425 µm (No. 40)	94.7	-
250 µm (No. 60)	86.6	-
150 µm (No. 100)	79.1	-
75 µm (No. 200)	74.5	-
28.9 (µm)	66.0	-
18.8 (µm)	58.8	-
11.1 (µm)	51.3	-
8.0 (µm)	47.2	-
5.7 (µm)	44.5	-
2.8 (µm)	42.9	-
1.2 (µm)	40.8	-



Soil Classification: CH Fat clay with sand

Gravel (%):	0	**Sand (%):**	25.5	**Silt (%):**	30.5	**Clay (%):**	44.0
D_{60} (µm):	20.7						

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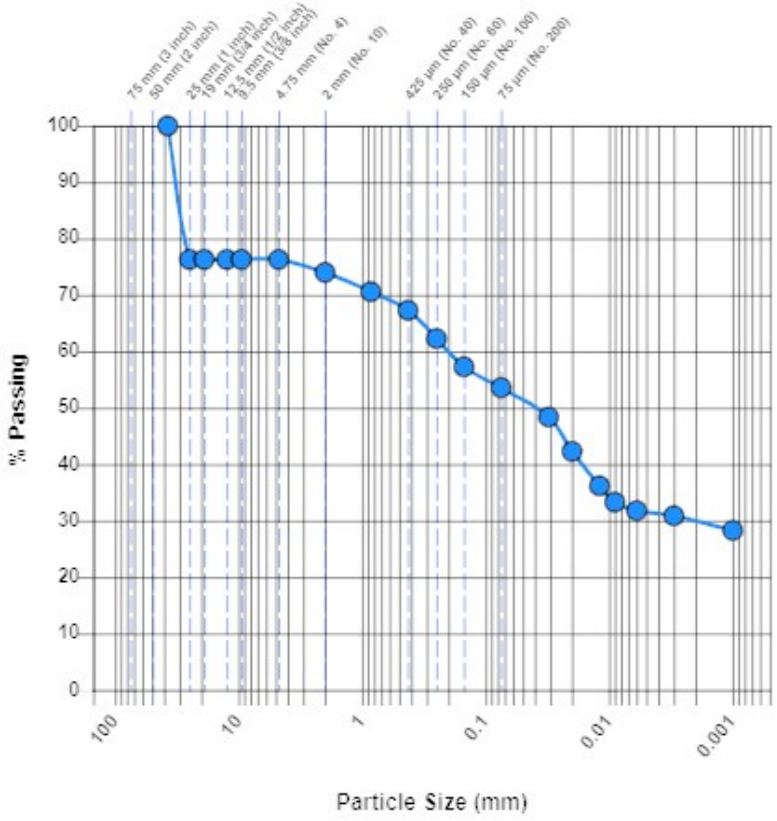
Sample Information

Sample Number:	499092	**Depth (ft):**	2-3.5
Boring Number:	B-19	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
37.5 mm (1.5 inch)	100.0	-
25 mm (1 inch)	76.3	-
19 mm (3/4 inch)	76.3	-
12.5 mm (1/2 inch)	76.3	-
9.5 mm (3/8 inch)	76.3	-
4.75 mm (No. 4)	76.3	-
2 mm (No. 10)	74.0	-
850 µm (No. 20)	70.6	-
425 µm (No. 40)	67.3	-
250 µm (No. 60)	62.3	-
150 µm (No. 100)	57.3	-
75 µm (No. 200)	53.6	-
31.4 (µm)	48.4	-
20.2 (µm)	42.3	-
11.9 (µm)	36.2	-
8.5 (µm)	33.3	-
6.0 (µm)	31.8	-
2.9 (µm)	30.9	-
1.3 (µm)	28.3	-



Soil Classification: CH Fat clay with gravel

Gravel (%):	23.7	**Sand (%):**	22.7	**Silt (%):**	22.1	**Clay (%):**	31.5
D_{60} (µm):	204.0	**D_{30} (µm):**	2.3				

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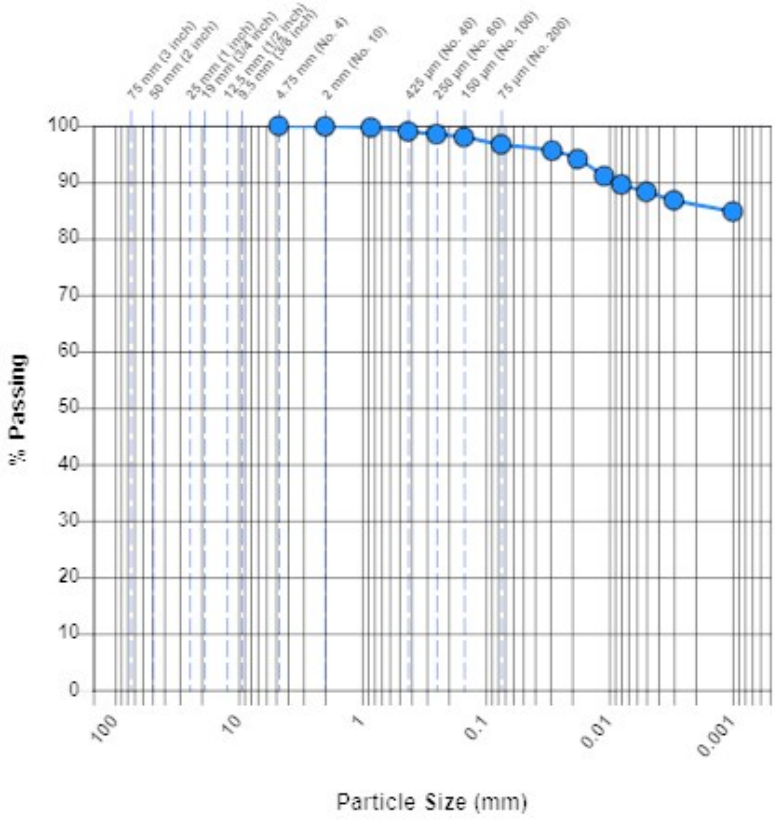
Sample Information

Sample Number:	499093	**Depth (ft):**	17-18.5
Boring Number:	B-19	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
4.75 mm (No. 4)	100.0	-
2 mm (No. 10)	99.9	-
850 µm (No. 20)	99.7	-
425 µm (No. 40)	99.0	-
250 µm (No. 60)	98.5	-
150 µm (No. 100)	98.0	-
75 µm (No. 200)	96.7	-
28.9 (µm)	95.6	-
18.4 (µm)	94.1	-
10.7 (µm)	91.1	-
7.6 (µm)	89.6	-
5.4 (µm)	88.3	-
2.6 (µm)	86.8	-
1.2 (µm)	84.8	-



Soil Classification: CH Fat Clay

Gravel (%):	0.0	**Sand (%):**	3.3	**Silt (%):**	8.4	**Clay (%):**	88.3

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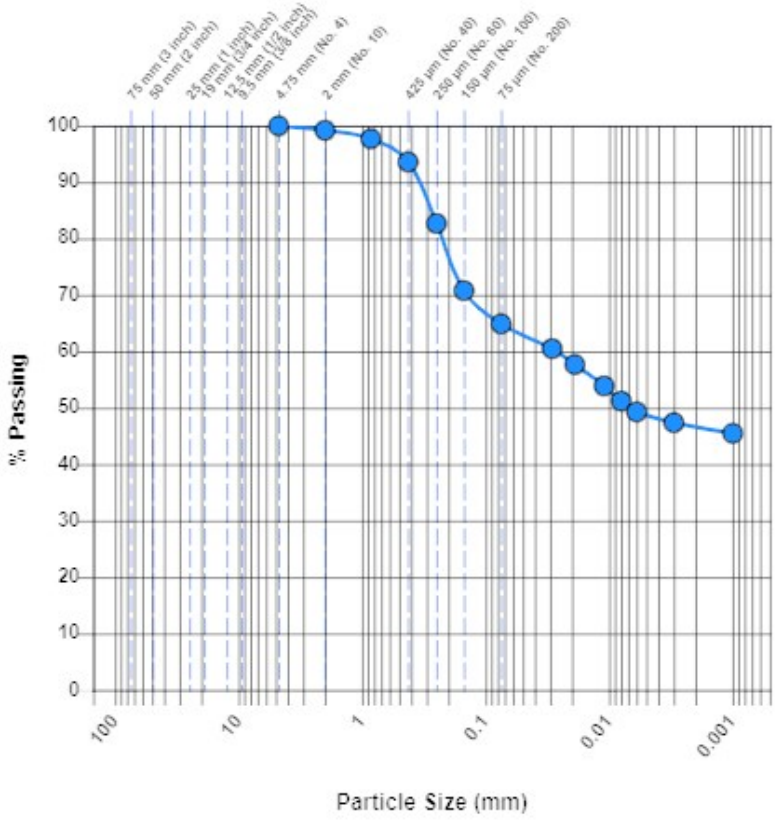
Sample Information

Sample Number:	499095	**Depth (ft):**	0-2
Boring Number:	B-20	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
4.75 mm (No. 4)	100.0	-
2 mm (No. 10)	99.2	-
850 µm (No. 20)	97.7	-
425 µm (No. 40)	93.6	-
250 µm (No. 60)	82.7	-
150 µm (No. 100)	70.8	-
75 µm (No. 200)	64.9	-
28.9 (µm)	60.5	-
18.5 (µm)	57.7	-
10.9 (µm)	53.9	-
7.8 (µm)	51.2	-
5.5 (µm)	49.3	-
2.7 (µm)	47.4	-
1.2 (µm)	45.5	-



Soil Classification: CH Sandy fat clay

Gravel (%):	0.0	**Sand (%):**	35.1	**Silt (%):**	16.2	**Clay (%):**	48.7
D_{60} (µm):	27.2						

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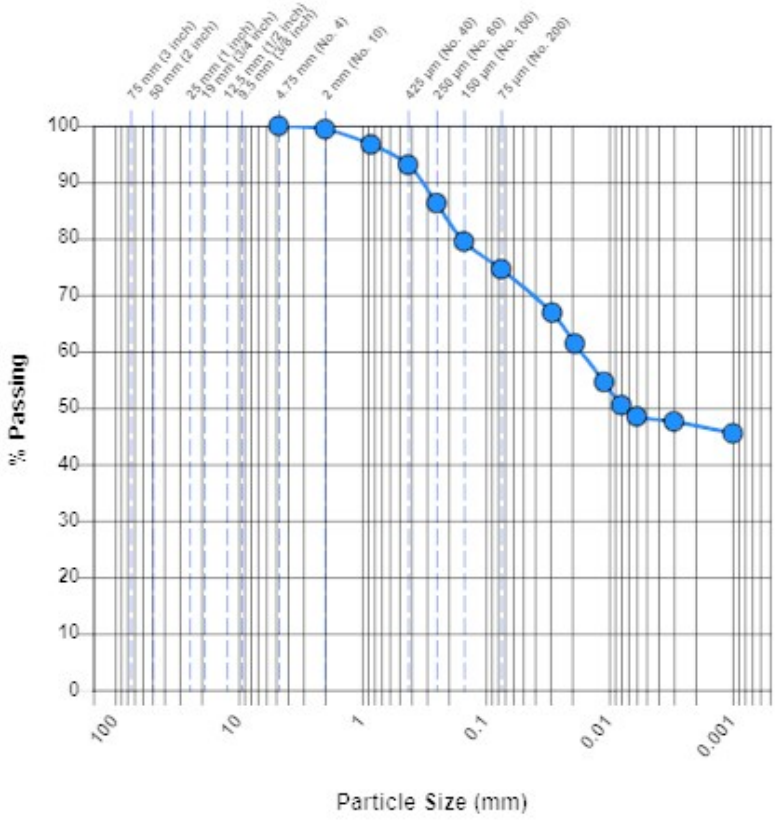
Sample Information

Sample Number:	499096	**Depth (ft):**	0-2
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
4.75 mm (No. 4)	100.0	-
2 mm (No. 10)	99.4	-
850 µm (No. 20)	96.7	-
425 µm (No. 40)	93.1	-
250 µm (No. 60)	86.3	-
150 µm (No. 100)	79.5	-
75 µm (No. 200)	74.6	-
28.8 (µm)	66.9	-
18.6 (µm)	61.4	-
11.0 (µm)	54.6	-
7.9 (µm)	50.5	-
5.6 (µm)	48.5	-
2.8 (µm)	47.6	-
1.2 (µm)	45.5	-



Soil Classification: CH Fat clay with sand

Gravel (%):	0.0	**Sand (%):**	25.4	**Silt (%):**	26.4	**Clay (%):**	48.2
D_{60} (µm):	17.4						

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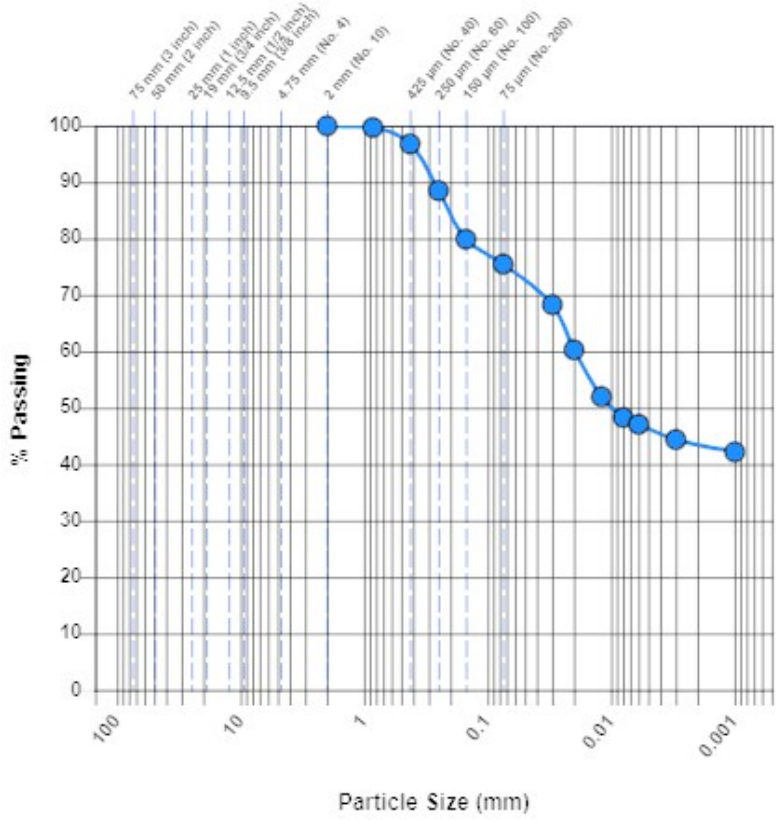
Sample Information

Sample Number:	499098	**Depth (ft):**	2-3.5
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.7	-
425 µm (No. 40)	96.8	-
250 µm (No. 60)	88.5	-
150 µm (No. 100)	79.9	-
75 µm (No. 200)	75.5	-
30.1 (µm)	68.3	-
19.5 (µm)	60.3	-
11.5 (µm)	52.0	-
8.2 (µm)	48.3	-
5.8 (µm)	47.1	-
2.9 (µm)	44.4	-
1.3 (µm)	42.2	-



Soil Classification: CH Fat clay with sand

Gravel (%):	0	**Sand (%):**	24.5	**Silt (%):**	29.3	**Clay (%):**	46.2
D_{60} (µm):	19.7						

General

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BRAUN INTERTEC
The Science You Build On.

Hydrometer And Sieve Analysis

ASTM D422

12/16/2022

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

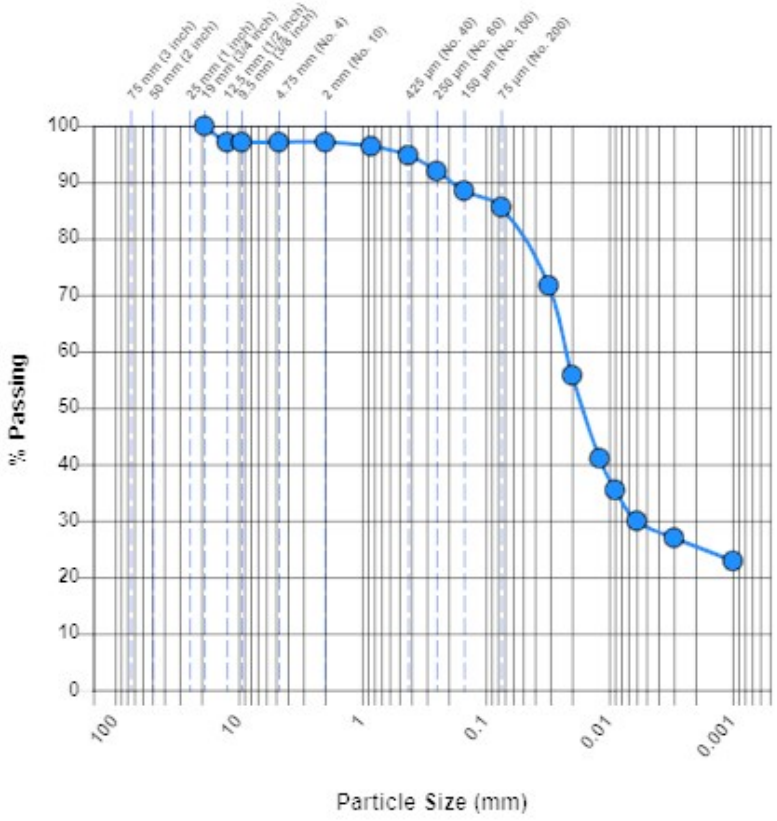
Sample Information

Sample Number:	499099	**Depth (ft):**	9.5-11
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
19 mm (3/4 inch)	100.0	-
12.5 mm (1/2 inch)	97.1	-
9.5 mm (3/8 inch)	97.1	-
4.75 mm (No. 4)	97.1	-
2 mm (No. 10)	97.1	-
850 µm (No. 20)	96.4	-
425 µm (No. 40)	94.8	-
250 µm (No. 60)	92.0	-
150 µm (No. 100)	88.5	-
75 µm (No. 200)	85.6	-
30.5 (µm)	71.7	-
20.1 (µm)	55.8	-
12.0 (µm)	41.1	-
8.6 (µm)	35.5	-
6.1 (µm)	30.0	-
3.0 (µm)	27.0	-
1.3 (µm)	22.9	-



Soil Classification: CL Lean clay

Gravel (%):	2.9	**Sand (%):**	11.5	**Silt (%):**	56.6	**Clay (%):**	29.0
D_{60} (µm):	22.9	**D_{30} (µm):**	6.0				

General

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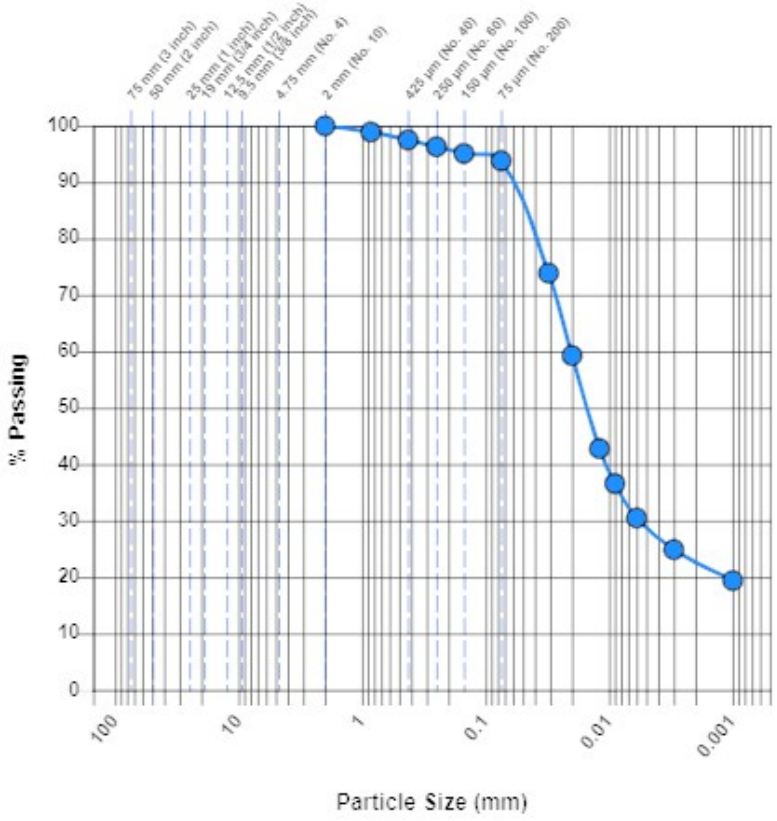
Sample Information

Sample Number:	499100	**Depth (ft):**	12-13.5'
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	98.9	-
425 µm (No. 40)	97.5	-
250 µm (No. 60)	96.3	-
150 µm (No. 100)	95.1	-
75 µm (No. 200)	93.8	-
30.9 (µm)	73.9	-
20.2 (µm)	59.3	-
12.1 (µm)	42.8	-
8.6 (µm)	36.6	-
6.2 (µm)	30.5	-
3.0 (µm)	24.9	-
1.4 (µm)	19.4	-



Soil Classification: CL Lean clay

Gravel (%):	0	**Sand (%):**	6.2	**Silt (%):**	65.2	**Clay (%):**	28.6
D_{60} (µm):	20.5	**D_{30} (µm):**	5.7				

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Viroqua, WI 54665

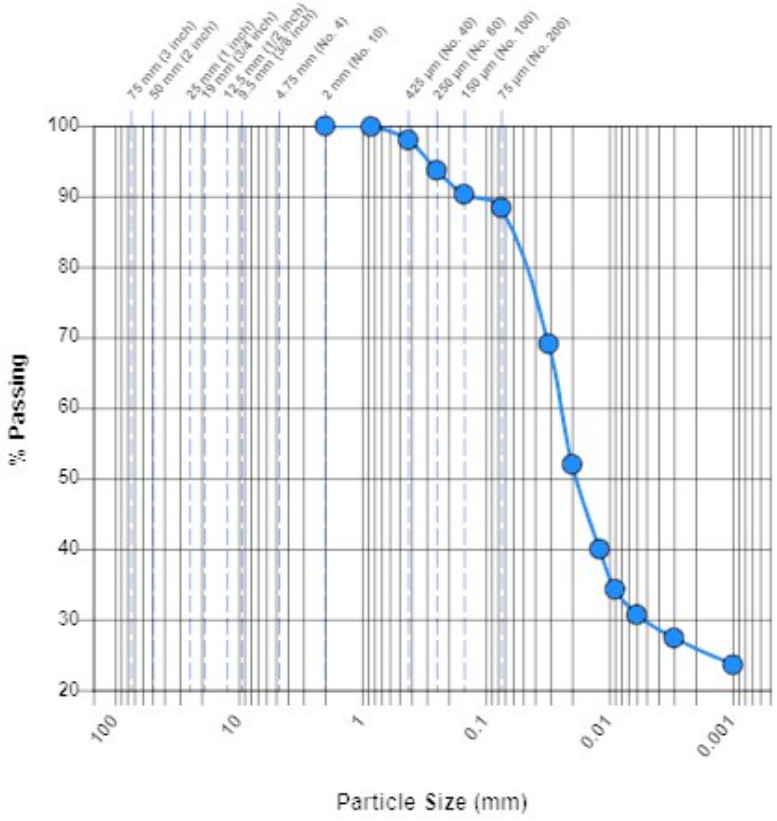
Sample Information

Sample Number:	499101	**Depth (ft):**	17-18.5
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.9	-
425 µm (No. 40)	98.0	-
250 µm (No. 60)	93.7	-
150 µm (No. 100)	90.3	-
75 µm (No. 200)	88.4	-
30.8 (µm)	69.1	-
20.3 (µm)	52.0	-
12.0 (µm)	40.0	-
8.6 (µm)	34.3	-
6.1 (µm)	30.7	-
3.0 (µm)	27.4	-
1.3 (µm)	23.6	-



Soil Classification: CL Lean clay

Gravel (%):	0	**Sand (%):**	11.6	**Silt (%):**	58.8	**Clay (%):**	29.6
D_{60} (µm):	25.1	**D_{30} (µm):**	5.4				

General

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Hydrometer And Sieve Analysis

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Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
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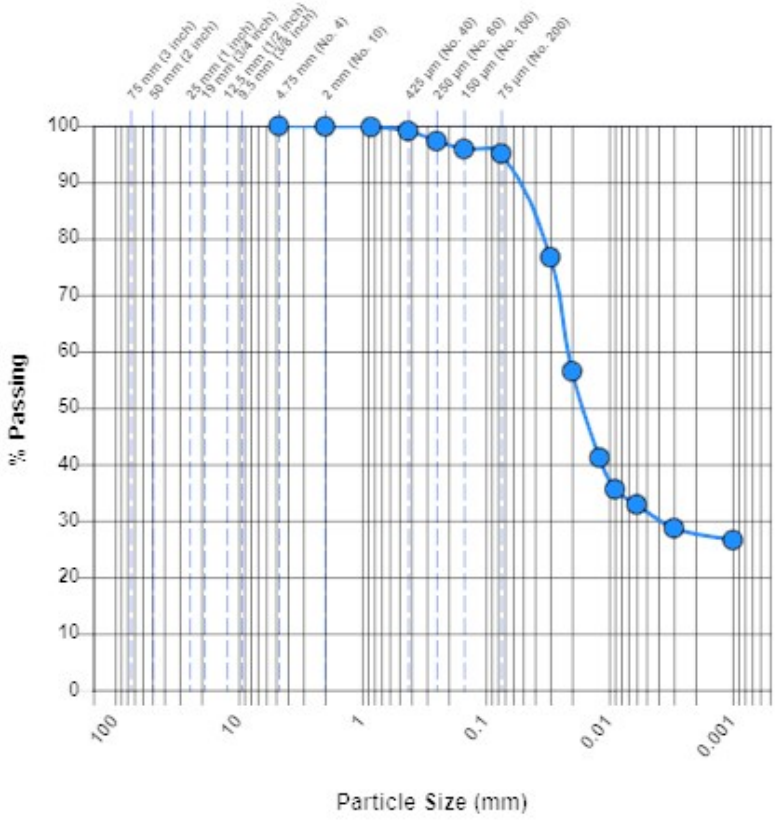
Sample Information

Sample Number:	499102	**Depth (ft):**	19.5-21
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
4.75 mm (No. 4)	100.0	-
2 mm (No. 10)	99.9	-
850 µm (No. 20)	99.8	-
425 µm (No. 40)	99.1	-
250 µm (No. 60)	97.3	-
150 µm (No. 100)	95.9	-
75 µm (No. 200)	95.1	-
30.1 (µm)	76.7	-
20.0 (µm)	56.5	-
12.0 (µm)	41.2	-
8.6 (µm)	35.6	-
6.1 (µm)	32.9	-
3.0 (µm)	28.7	-
1.3 (µm)	26.6	-



Soil Classification: CL Lean clay

Gravel (%):	0.0	**Sand (%):**	4.9	**Silt (%):**	63.6	**Clay (%):**	31.5
D_{60} (µm):	21.7	**D_{30} (µm):**	3.9				

General

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Hydrometer And Sieve Analysis

ASTM D422

12/16/2022

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Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

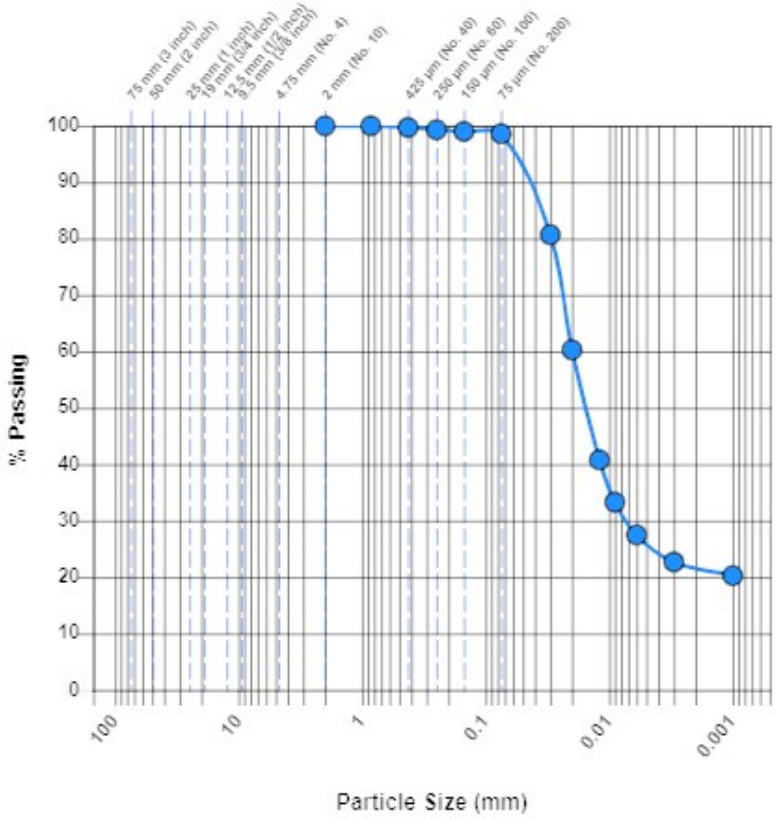
Sample Information

Sample Number:	499104	**Depth (ft):**	29.5-31
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	100.0	-
425 µm (No. 40)	99.7	-
250 µm (No. 60)	99.3	-
150 µm (No. 100)	99.0	-
75 µm (No. 200)	98.6	-
30.0 (µm)	80.7	-
20.0 (µm)	60.3	-
12.0 (µm)	40.8	-
8.7 (µm)	33.3	-
6.2 (µm)	27.5	-
3.0 (µm)	22.7	-
1.3 (µm)	20.3	-



Soil Classification: CL Lean clay

Gravel (%):	0	**Sand (%):**	1.4	**Silt (%):**	72.7	**Clay (%):**	25.9
D_{60} (µm):	19.9	**D_{30} (µm):**	7.3				

General

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11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Standard Proctor M-D Relationship

ASTM D698

Report Date: 12/07/2022

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

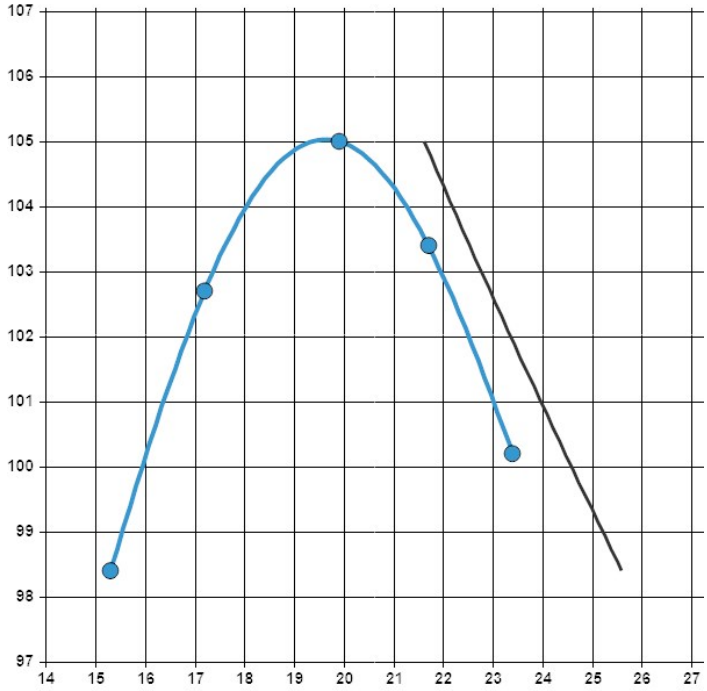
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	497688	**Depth (ft):**	0-2'
Boring Number:	B-19	**Sampled By:**	Drill Crew
Sampling Method:	Auger Boring ASTM D1452		
Location Details:	B-19, 0-2'		
Sample Date:	12/07/2022		
Received Date:	12/07/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/07/2022	**Tested By:**	Vang, Yang

Laboratory Data



Proctor ID:	P-01-std		
Maximum Dry Density (pcf):	105.0		
Optimum Moisture (%):	19.6		
Method:	Method A		
Preparation Method:	Moist		
Rammer Type:	Manual Round		
Specific Gravity:	2.65		
Specific Gravity Source:	Assumed		
Passes #200 (%):	75.0	**Retained #200 (%):**	25.0
Retained On 3/4 (%):	0	**Retained On 3/8 (%):**	0
Retained On #4 (%):	0	**Passing #4 (%):**	100

Classification: CH Fat clay with sand, brown

General

Remarks: The % passing the #200 is for informational purposes only.

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Modified Proctor M-D Relationship

ASTM D1557

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

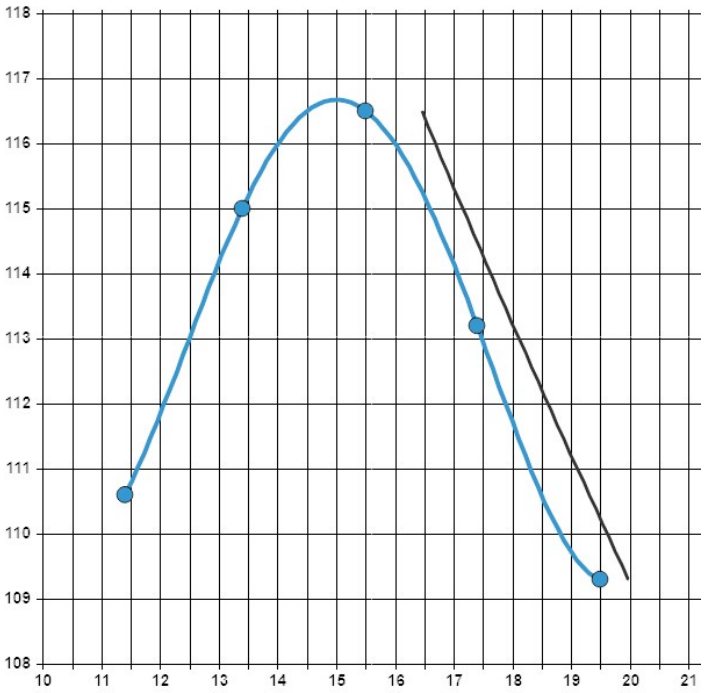
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	497688	**Depth (ft):**	0-2'
Boring Number:	B-19	**Sampled By:**	Drill Crew
Sampling Method:	Auger Boring ASTM D1452		
Location Details:	B-19, 0-2'		
Sample Date:	12/07/2022		
Received Date:	12/07/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/07/2022	**Tested By:**	Vang, Yang

Laboratory Data



Proctor ID:	P-01-mod
Maximum Dry Density (pcf):	116.7
Optimum Moisture (%):	15.0
Method:	Method A
Total Retained:	0 % on #4 Sieve
Preparation Method:	Moist
Rammer Type:	Mechanical Round
Specific Gravity:	2.70
Specific Gravity Source:	Assumed

Passes #200 (%):	75.0	**Retained #200 (%):**	25.0
Retained On 3/4 (%):	0	**Retained On 3/8 (%):**	0
Retained On #4 (%):	0	**Passing #4 (%):**	100

Classification: CH Fat clay with sand, brown

General

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Standard Proctor M-D Relationship

ASTM D698

Report Date: 07/03/2023

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

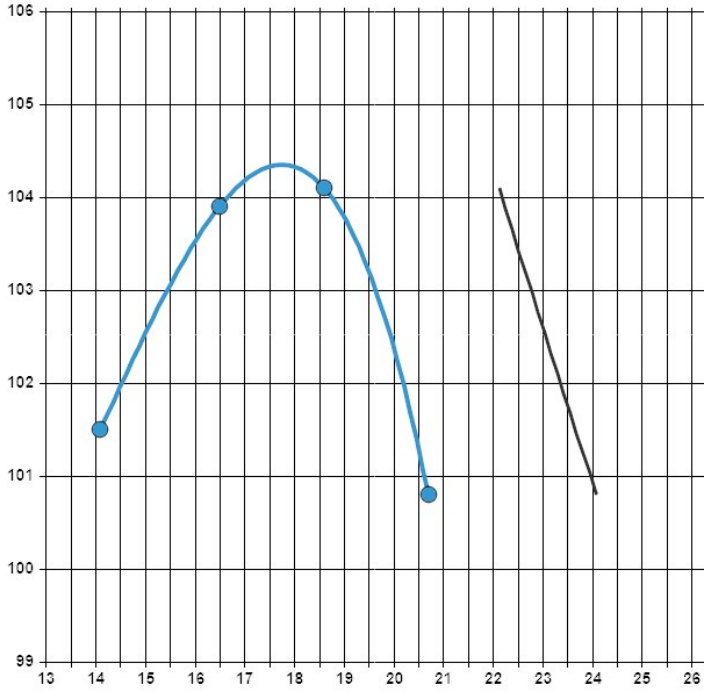
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522626	**Depth (ft):**	0-2
Boring Number:	B-19	**Sampled By:**	Wright, Brandon
Sampling Method:	Project Specified		
Location Details:	B-19		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	05/24/2023	**Tested By:**	Vang, Yang

Laboratory Data



Proctor ID:	P-03-std		
Maximum Dry Density (pcf):	104.3		
Optimum Moisture (%):	17.8		
Method:	Method A		
Preparation Method:	Moist		
Rammer Type:	Manual Round		
Specific Gravity:	2.67		
Specific Gravity Source:	ASTM D854		
Passes #200 (%):	95.0	**Retained #200 (%):**	5.0
Retained On 3/4 (%):	0	**Retained On 3/8 (%):**	0
Retained On #4 (%):	1	**Passing #4 (%):**	99

Classification: Fat Clay (CH)

General

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Standard Proctor M-D Relationship

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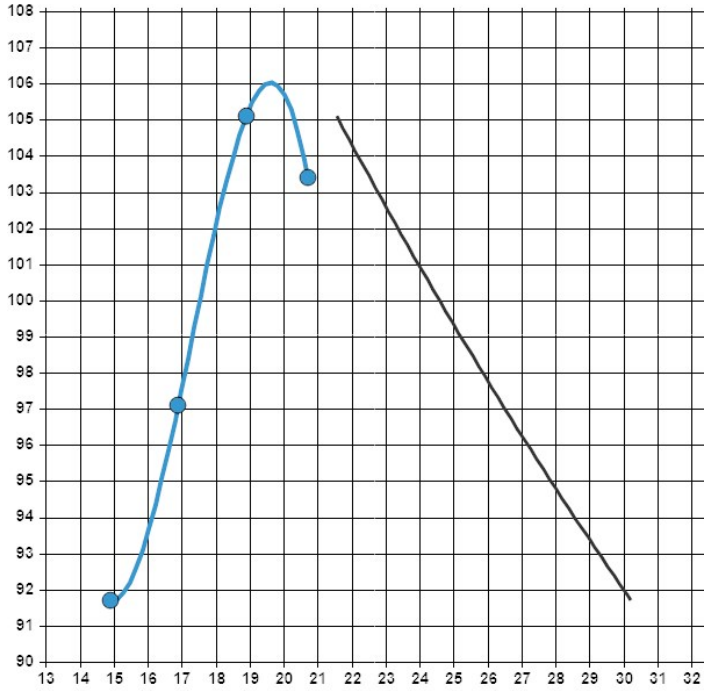
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522628	**Depth (ft):**	0-2
Boring Number:	B-20	**Sampled By:**	Wright, Brandon
Sampling Method:	Project Specified		
Location Details:	B-20		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	05/24/2023	**Tested By:**	Vang, Yang

Laboratory Data



Proctor ID:	P-04-std		
Maximum Dry Density (pcf):	106.0		
Optimum Moisture (%):	19.6		
Method:	Method A		
Preparation Method:	Moist		
Rammer Type:	Manual Round		
Specific Gravity:	2.66		
Specific Gravity Source:	ASTM D854		
Passes #200 (%):	52.0	**Retained #200 (%):**	48.0
Retained On 3/4 (%):	4	**Retained On 3/8 (%):**	5
Retained On #4 (%):	5	**Passing #4 (%):**	95

Classification: CL Sandy lean clay, brown

General

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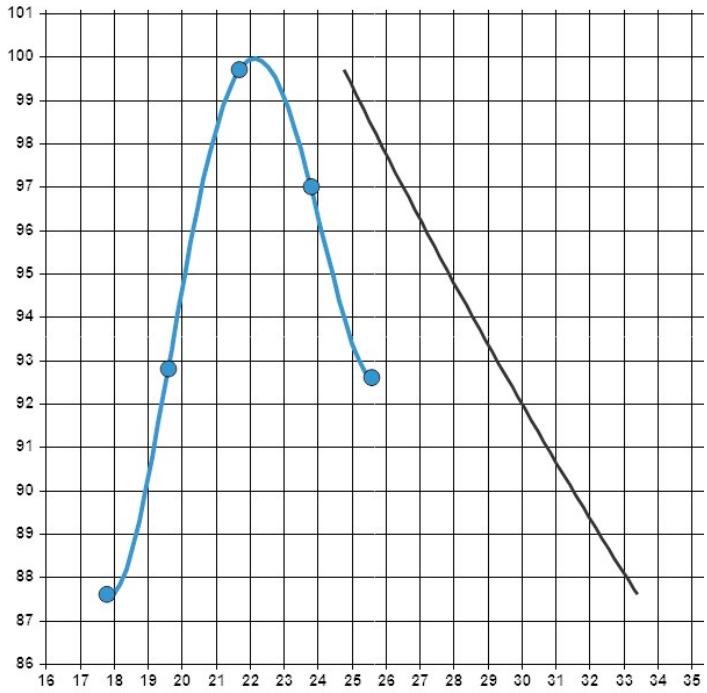
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	497689	**Depth (ft):**	0-2'
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sampling Method:	Auger Boring ASTM D1452		
Location Details:	B-21, 0-2'		
Sample Date:	12/07/2022		
Received Date:	12/07/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/07/2022	**Tested By:**	Vang, Yang

Laboratory Data



Proctor ID:	P-02-std		
Maximum Dry Density (pcf):	100.0		
Optimum Moisture (%):	22.1		
Method:	Method A		
Preparation Method:	Moist		
Rammer Type:	Manual Round		
Specific Gravity:	2.65		
Specific Gravity Source:	Assumed		
Passes #200 (%):	72.0	**Retained #200 (%):**	28.0
Retained On 3/4 (%):	0	**Retained On 3/8 (%):**	0
Retained On #4 (%):	1	**Passing #4 (%):**	99

Classification: CH Fat clay with sand, brown

General

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Modified Proctor M-D Relationship

ASTM D1557

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Viroqua, WI 54665

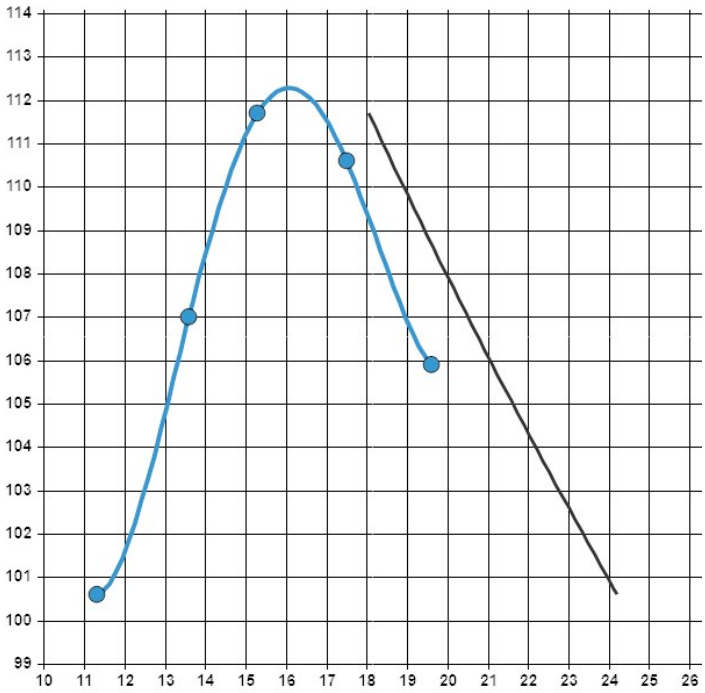
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	497689	**Depth (ft):**	0-2'
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sampling Method:	Auger Boring ASTM D1452		
Location Details:	B-21, 0-2'		
Sample Date:	12/07/2022		
Received Date:	12/07/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/07/2022	**Tested By:**	Vang, Yang

Laboratory Data



Proctor ID:	P-02-mod
Maximum Dry Density (pcf):	112.3
Optimum Moisture (%):	16.1
Method:	Method A
Total Retained:	1 % on #4 Sieve
Preparation Method:	Moist
Rammer Type:	Mechanical Round
Specific Gravity:	2.65
Specific Gravity Source:	Assumed

Passes #200 (%):	72.0	**Retained #200 (%):**	28.0
Retained On 3/4 (%):	0	**Retained On 3/8 (%):**	0
Retained On #4 (%):	1	**Passing #4 (%):**	99

Classification: CH Fat clay with sand, brown

General

Remarks: The % passing the #200 is for informational purposes only.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
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Hydraulic Conductivity

ASTM D5084

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522626	**Depth (ft):**	0-2
Sampling Method:	Project Specified	**Sampled By:**	Wright, Brandon
Boring Number:	B-19		
Sample Location :	B-19		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/09/2023	**Tested By:**	Seokaran, Kanhai

Laboratory Data

Type Of Specimen:	Remolded	**Back Pressure (psi):**	81.00	
Permeant Liquid:	Water	**Specific Gravity:**	2.67	(ASTM D854)
Saturation B Coefficient:	1.00	**Effective Pressure (psi):**	8.00	

Method: Method C Falling Head Rising Tailwater

Elapsed Time (sec)	Average Test Temp. (°C)	Influent Reading Initial (cm)	Influent Reading Final (cm)	Effluent Reading Initial (cm)	Effluent Reading Final (cm)	Average Head Loss (cm)	Hydraulic Gradient	Hydraulic Conductivity @ 20 °C (cm/sec)
19380	22.0	19.60	19.40	6.40	6.60	224.0	39.76	5.7E-09
49260	22.0	19.40	18.90	6.60	7.10	223.3	39.64	5.6E-09
36780	22.0	18.90	18.55	7.10	7.45	222.5	39.49	5.3E-09
37920	22.0	18.55	18.20	7.45	7.80	221.8	39.36	5.1E-09

Average Of Last Four Hydraulic Conductivity (cm/sec): 5.4E-09

	Initial	Final
Saturation (%)	84.8	99.6
Moisture Content (%):	18	24.3
Dry Density Of Specimen (pcf):	106.3	101.0
Soil Classification:	CH Fat clay	

General

Remarks: Control parameters meet the testing requirements.

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Hydraulic Conductivity

ASTM D5084

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522626	**Depth (ft):**	0-2
Sampling Method:	Project Specified	**Sampled By:**	Wright, Brandon
Boring Number:	B-19		
Sample Location :	B-19		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/09/2023	**Tested By:**	Seokaran, Kanhai

Laboratory Data

Type Of Specimen:	Remolded	**Back Pressure (psi):**	81.00	
Permeant Liquid:	Water	**Specific Gravity:**	2.67	(ASTM D854)
Saturation B Coefficient:	1.00	**Effective Pressure (psi):**	8.00	

Method: Method C Falling Head Rising Tailwater

Elapsed Time (sec)	Average Test Temp. (°C)	Influent Reading Initial (cm)	Influent Reading Final (cm)	Effluent Reading Initial (cm)	Effluent Reading Final (cm)	Average Head Loss (cm)	Hydraulic Gradient	Hydraulic Conductivity @ 20 °C (cm/sec)
19380	22.0	11.20	11.00	16.80	17.00	205.2	36.63	6.2E-09
49140	22.0	11.00	10.45	17.00	17.55	204.5	36.49	6.7E-09
89580	22.0	10.65	9.85	14.00	14.80	206.9	36.92	5.3E-09
9300	22.0	10.00	9.90	14.90	15.00	206.0	36.77	6.4E-09

Average Of Last Four Hydraulic Conductivity (cm/sec): 6.1E-09

	Initial	Final
Saturation (%)	82.2	99.6
Moisture Content (%):	19.7	24.3
Dry Density Of Specimen (pcf):	101.6	100.9
Soil Classification:	CH Fat clay	

General

Remarks: Control parameters meet the testing requirements.

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Hydraulic Conductivity

ASTM D5084

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number: 522628
Depth (ft): 0-2
Sampling Method: Project Specified
Sampled By: Wright, Brandon
Boring Number: B-20
Sample Location : B-20
Sample Date: 05/24/2023
Received Date: 05/24/2023
Lab: 11001 Hampshire Ave S, Bloomington, MN
Tested Date: 06/08/2023
Tested By: Seokaran, Kanhai

Laboratory Data

Type Of Specimen: Remolded
Back Pressure (psi): 81.00
Permeant Liquid: Water
Specific Gravity: 2.66 (ASTM D854)
Saturation B Coefficient: 1.00
Effective Pressure (psi): 8.00
Method: Method C Falling Head Rising Tailwater

Elapsed Time (sec)	Average Test Temp. (°C)	Influent Reading Initial (cm)	Influent Reading Final (cm)	Effluent Reading Initial (cm)	Effluent Reading Final (cm)	Average Head Loss (cm)	Hydraulic Gradient	Hydraulic Conductivity @ 20 °C (cm/sec)
360	22.0	20.90	20.70	6.50	6.70	225.2	39.94	3.0E-07
900	22.0	20.70	20.20	6.70	7.20	224.5	39.81	3.0E-07
2940	22.0	20.20	18.60	7.20	8.80	222.4	39.44	3.0E-07
7740	22.0	18.60	14.60	8.80	12.80	216.8	38.45	2.9E-07

Average Of Last Four Hydraulic Conductivity (cm/sec): 3.0E-07

	Initial	Final
Saturation (%)	85.1	99.2
Moisture Content (%):	22.0	24.8
Dry Density Of Specimen (pcf):	98.4	99.7

Soil Classification: CL Sandy lean clay

General

Remarks: Control parameters meet the testing requirements.

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Hydraulic Conductivity

ASTM D5084

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number: 498838
Depth (ft): 26-28.5
Boring Number: MW-14
Sampled By: Drill Crew
Sample Date: 11/29/2022
Received Date: 12/14/2022
Lab: 11001 Hampshire Ave S, Bloomington, MN
Tested Date: 12/14/2022
Tested By: Seokaran, Kanhai

Laboratory Data

Type Of Specimen: Intact
Back Pressure (psi): 81.00
Permeant Liquid: Water
Specific Gravity: 2.65 (Assumed)
Saturation B Coefficient: 1.00
Effective Pressure (psi): 8.00
Method: Method C Falling Head Rising Tailwater

Elapsed Time (sec)	Average Test Temp. (°C)	Influent Reading Initial (cm)	Influent Reading Final (cm)	Effluent Reading Initial (cm)	Effluent Reading Final (cm)	Average Head Loss (cm)	Hydraulic Gradient	Hydraulic Conductivity @ 20 °C (cm/sec)
18600	22.0	13.50	12.75	10.30	11.05	213.5	31.65	3.0E-08
18240	22.0	10.20	9.30	13.60	14.50	206.7	30.65	3.8E-08
239160	22.0	9.55	0.95	14.50	23.10	197.5	29.28	2.9E-08
15300	22.0	21.00	20.40	8.50	9.10	222.9	33.05	2.8E-08

Average Of Last Four Hydraulic Conductivity (cm/sec): 3.1E-08

	Initial	Final
Saturation (%)	105.6	105.2
Moisture Content (%):	25.3	24.1
Dry Density Of Specimen (pcf):	101.2	102.9

Soil Classification: CL Lean clay

General

Results: The test is for informational purposes.

Remarks: Control parameters meet the testing requirements.

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Hydraulic Conductivity

ASTM D5084

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number: 498836
Depth (ft): 10-12
Boring Number: MW-16
Sampled By: Drill Crew
Sample Date: 11/29/2022
Received Date: 12/14/2022
Lab: 11001 Hampshire Ave S, Bloomington, MN
Tested Date: 12/14/2022
Tested By: Seokaran, Kanhai

Laboratory Data

Type Of Specimen: Intact
Back Pressure (psi): 81.00
Permeant Liquid: Water
Specific Gravity: 2.65 (Assumed)
Saturation B Coefficient: 1.00
Effective Pressure (psi): 8.00
Method: Method C Falling Head Rising Tailwater

Elapsed Time (sec)	Average Test Temp. (°C)	Influent Reading Initial (cm)	Influent Reading Final (cm)	Effluent Reading Initial (cm)	Effluent Reading Final (cm)	Average Head Loss (cm)	Hydraulic Gradient	Hydraulic Conductivity @ 20 °C (cm/sec)
18060	22.0	18.25	18.05	4.65	4.85	224.4	31.75	2.9E-08
33300	22.0	16.25	15.90	7.90	8.25	219.0	30.98	2.9E-08
70200	22.0	15.90	15.15	8.25	9.00	217.9	30.83	2.9E-08
17580	22.0	15.40	15.20	9.00	9.20	217.2	30.73	3.1E-08

Average Of Last Four Hydraulic Conductivity (cm/sec): 3.0E-08

	Initial	Final
Saturation (%)	113.2	109.7
Moisture Content (%):	25.7	25.4
Dry Density Of Specimen (pcf):	103.3	102.6

Soil Classification: CL Lean clay

General

Results: The test is for informational purposes.

Remarks: Control parameters meet the testing requirements.

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Specific Gravity Of Soil

ASTM D854

Report Date: 07/03/2023

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522626	**Depth (ft):**	0-2
Sampling Method:	Project Specified	**Sampled By:**	Wright, Brandon
Boring Number:	B-19		
Location Details:	B-19		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/08/2023	**Tested By:**	Streier, Jim

Laboratory Data

Soil Specific Gravity At 20 °C:	2.67
Method Used:	Method B Dry

General

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
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Specific Gravity Of Soil

ASTM D854

Report Date: 07/03/2023

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

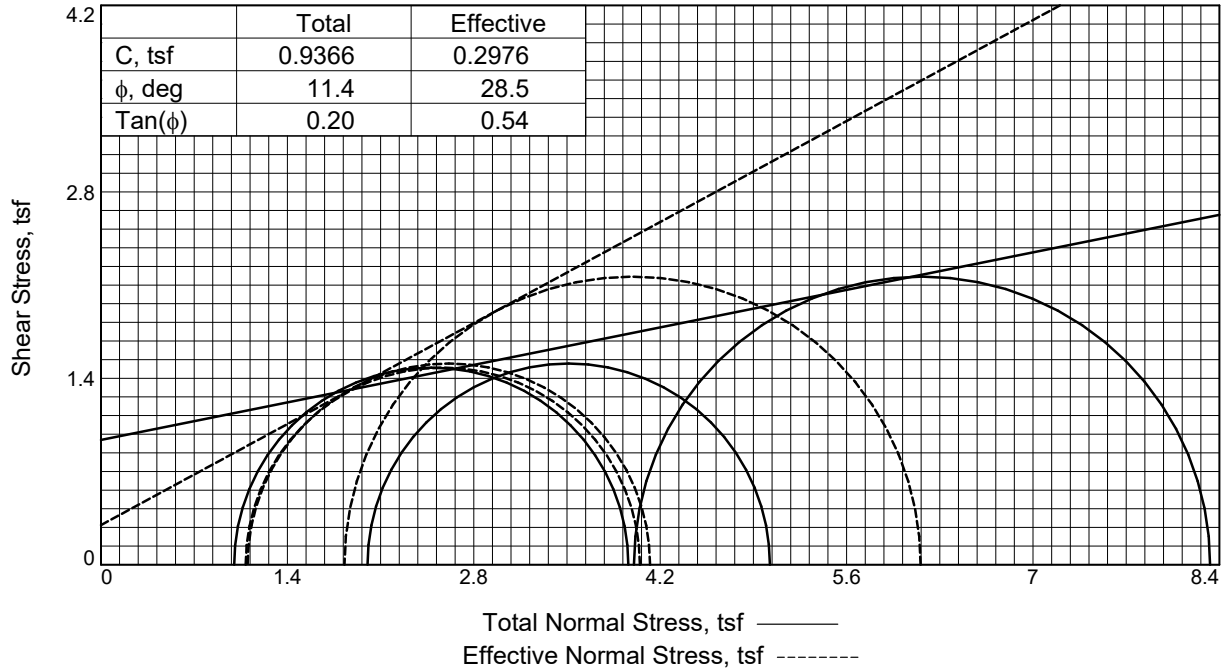
Sample Number:	522628	**Depth (ft):**	0-2
Sampling Method:	Project Specified	**Sampled By:**	Wright, Brandon
Boring Number:	B-20		
Location Details:	B-20		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/08/2023	**Tested By:**	Streier, Jim

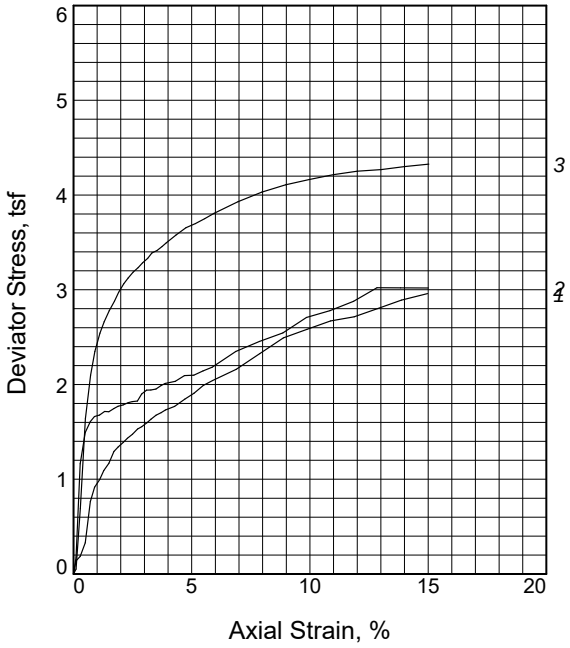
Laboratory Data

Soil Specific Gravity At 20 °C:	2.66
Method Used:	Method B Dry

General

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.





Sample No.		1	2	3
Initial	Water Content, %	26.3	25.4	28.5
	Dry Density, pcf	99.3	96.0	95.4
	Saturation, %	99.1	88.8	98.2
	Void Ratio	0.7291	0.7874	0.7991
	Diameter, in.	1.411	1.398	1.409
	Height, in.	2.824	2.821	2.814
At Test	Water Content, %	25.3	28.0	26.3
	Dry Density, pcf	101.3	97.1	99.5
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6945	0.7687	0.7246
	Diameter, in.	1.402	1.393	1.389
	Height, in.	2.805	2.812	2.775
Strain rate, %/min.				
Back Pressure, tsf		6.127	5.126	3.125
Cell Pressure, tsf		7.128	7.128	7.128
Fail. Stress, tsf		2.960	3.022	4.327
Total Pore Pr., tsf		6.041	6.026	5.299
Ult. Stress, tsf		2.960	3.019	4.327
Total Pore Pr., tsf		6.041	5.969	5.299
$\bar{\sigma}_1$ Failure, tsf		4.048	4.124	6.156
$\bar{\sigma}_3$ Failure, tsf		1.087	1.102	1.829

Type of Test:
CU with Pore Pressures

Sample Type: Shelby Tube

Description: Lean Clay (CL), brown

LL= 43 **PL=** 22 **PI=** 21

Assumed Specific Gravity= 2.75

Remarks: CU Triax ASTM D 4767

Figure _____

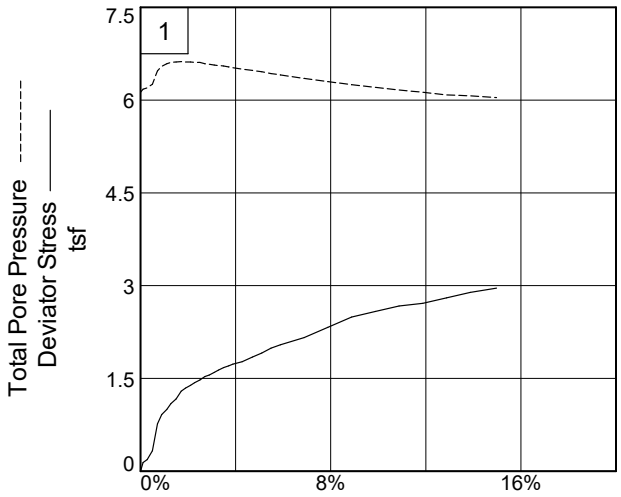
Client: Vernon County Solid Waste & Recycling Department

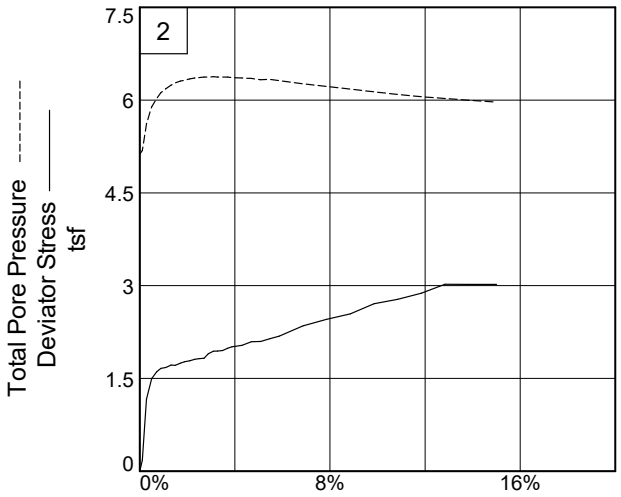
Project: Vernon County Landfill
S3705 County Road LF, Viroqua, WI

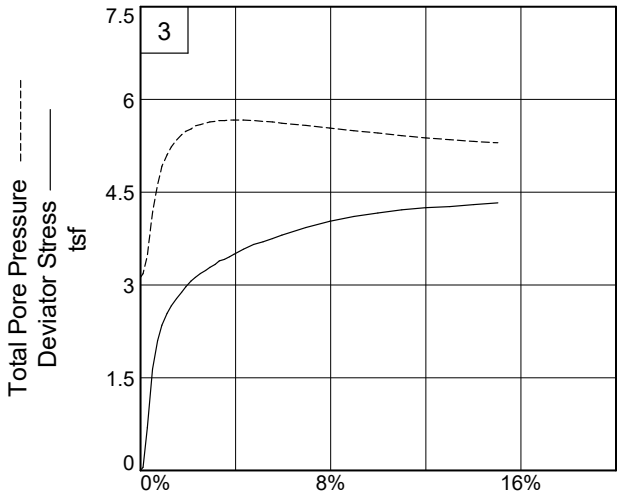
Source of Sample: MW-16 **Depth:** 7-9'

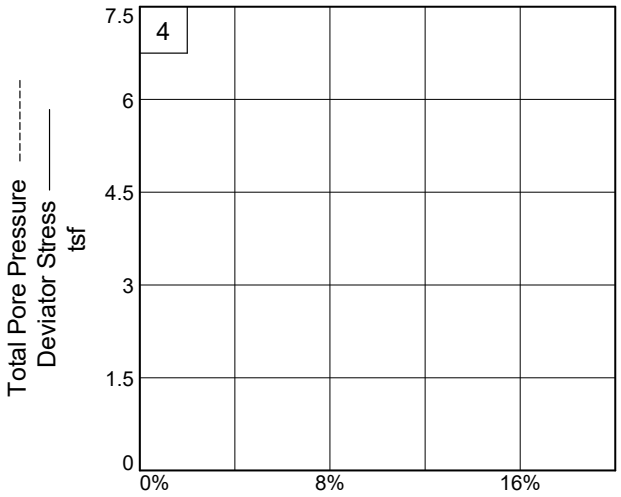
Proj. No.: B2205032 **Date Sampled:**

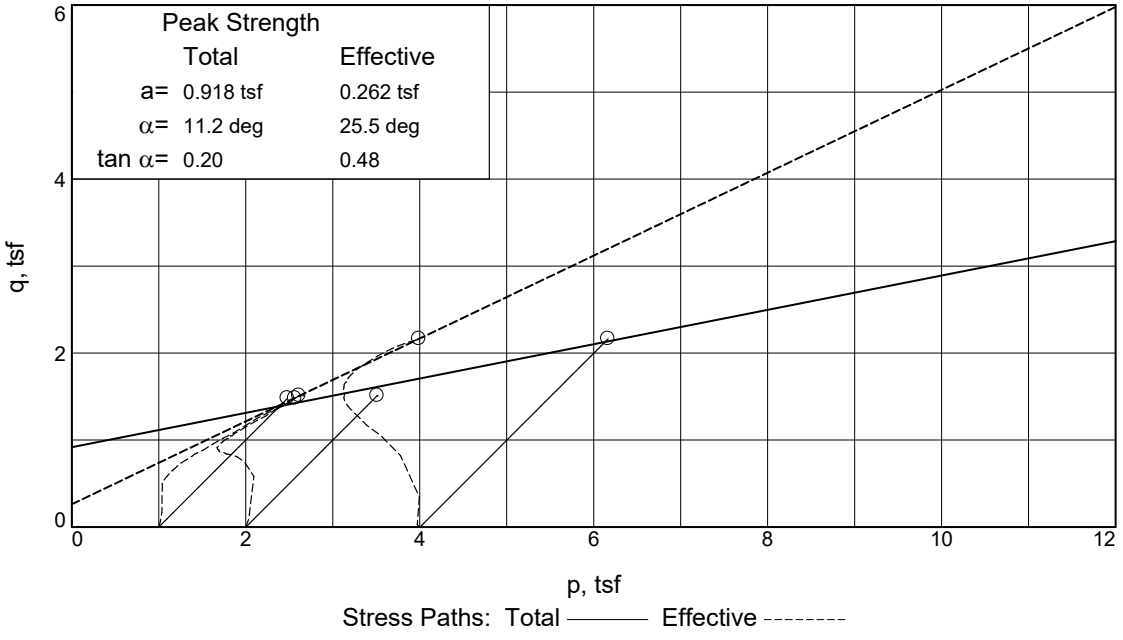
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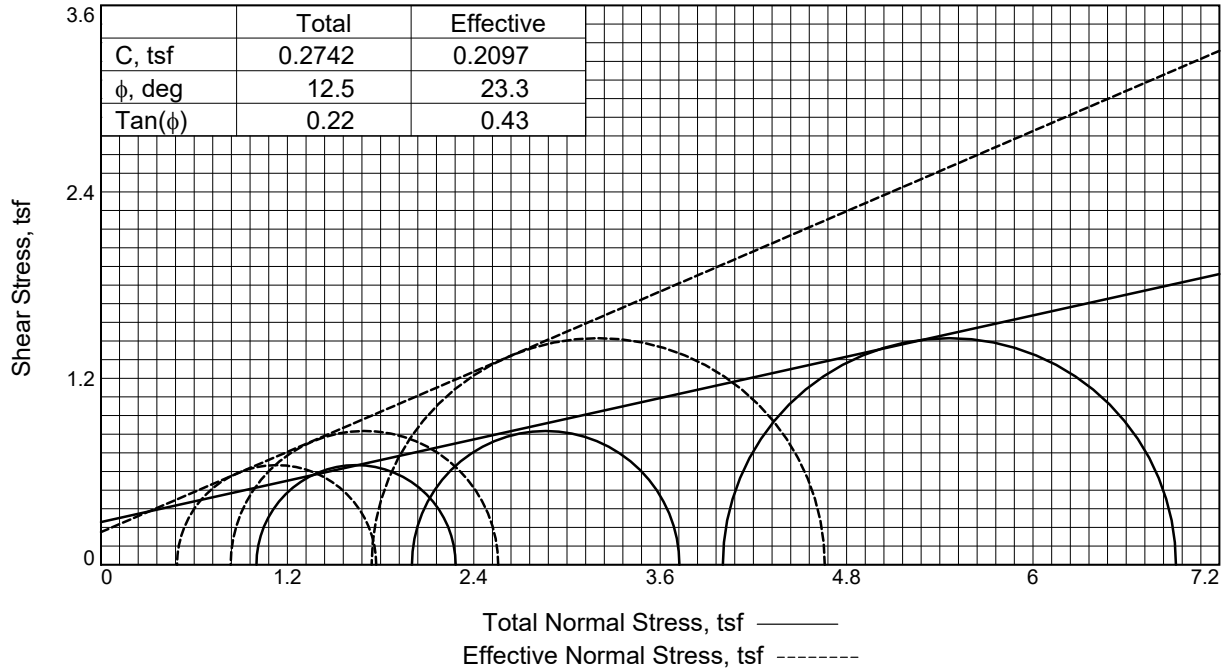
Client: Vernon County Solid Waste & Recycling Department

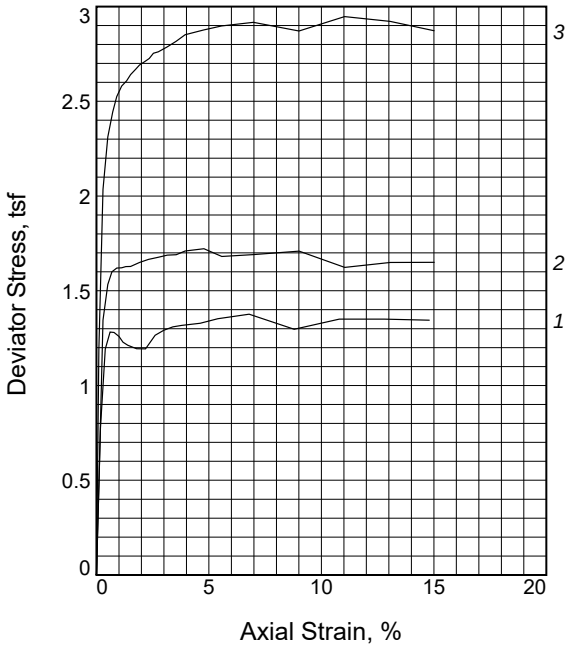
Project: Vernon County Landfill

Source of Sample: MW-16 **Depth:** 7-9'

Project No.: B2205032 **Figure** _____

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Sample No.		1	2	3
Initial	Water Content, %	24.2	24.2	24.2
	Dry Density, pcf	99.2	97.8	98.4
	Saturation, %	94.9	91.8	93.2
	Void Ratio	0.6807	0.7038	0.6934
	Diameter, in.	1.405	1.406	1.403
	Height, in.	2.801	2.778	2.801
At Test	Water Content, %	25.3	25.4	23.5
	Dry Density, pcf	99.5	99.3	102.3
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6753	0.6781	0.6287
	Diameter, in.	1.403	1.399	1.385
	Height, in.	2.798	2.764	2.765
Strain rate, %/min.				
Back Pressure, tsf		6.127	5.126	3.125
Cell Pressure, tsf		7.128	7.128	7.128
Fail. Stress, tsf		1.282	1.722	2.917
Total Pore Pr., tsf		6.638	6.293	5.386
Ult. Stress, tsf		1.194	1.623	2.871
Total Pore Pr., tsf		6.617	6.199	5.335
$\bar{\sigma}_1$ Failure, tsf		1.772	2.557	4.659
$\bar{\sigma}_3$ Failure, tsf		0.490	0.835	1.742

Type of Test:
CU with Pore Pressures

Sample Type: Remold

Description: Fat Clay (CH), brown

Assumed Specific Gravity= 2.67

Remarks: CU Triax ASTM D 4767

Figure _____

Client: Vernon County Solid Waste & Recycling Department

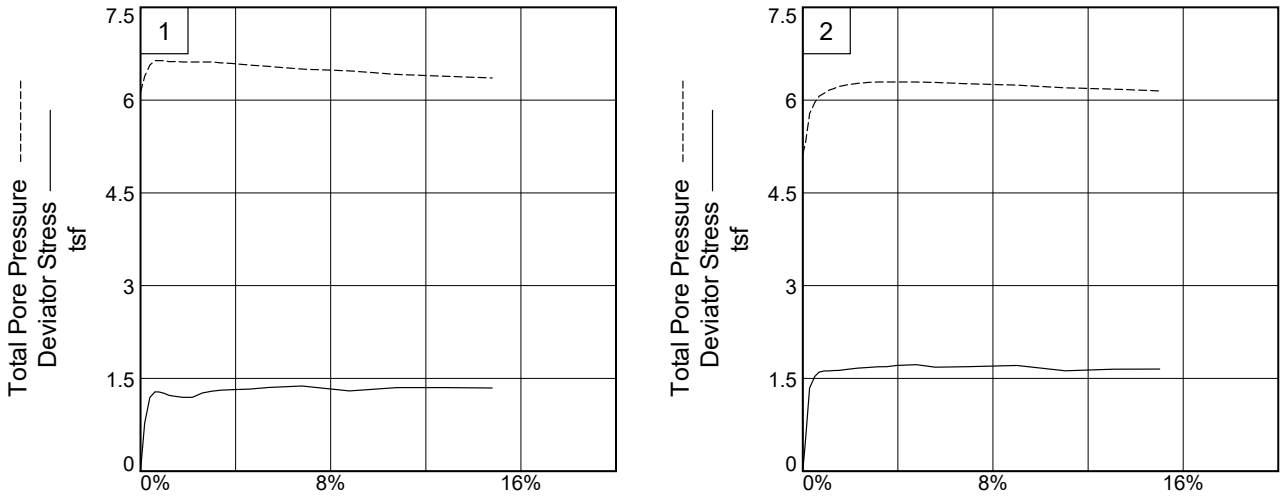
Project: Vernon County Landfill
S3705 County Road LF, Viroqua, WI

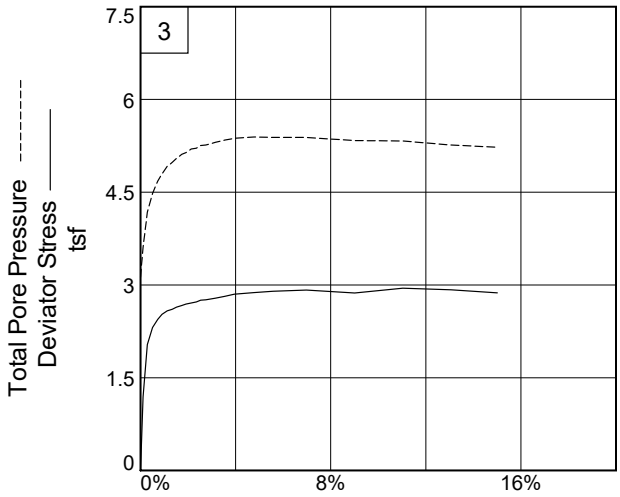
Source of Sample: B-19

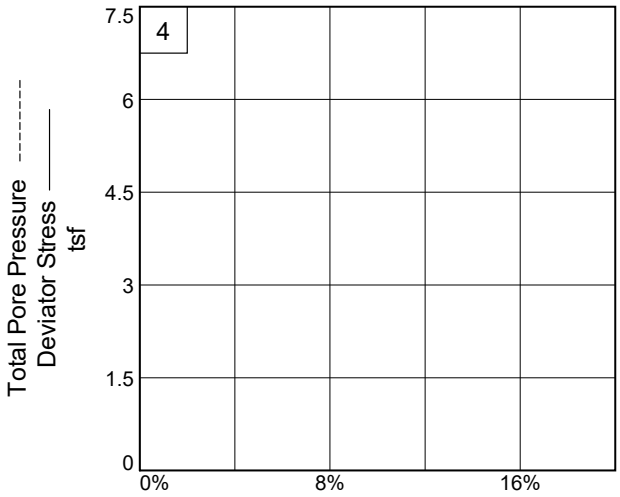
Sample Number: 522626

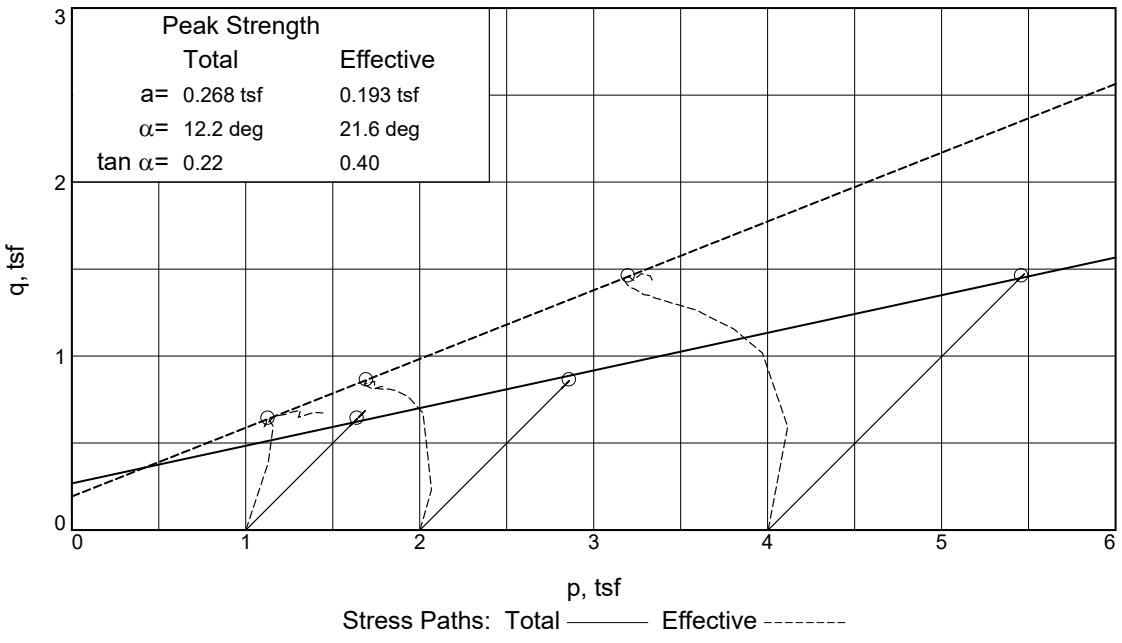
Proj. No.: B2205032 **Date Sampled:**

BRAUN INTERTEC









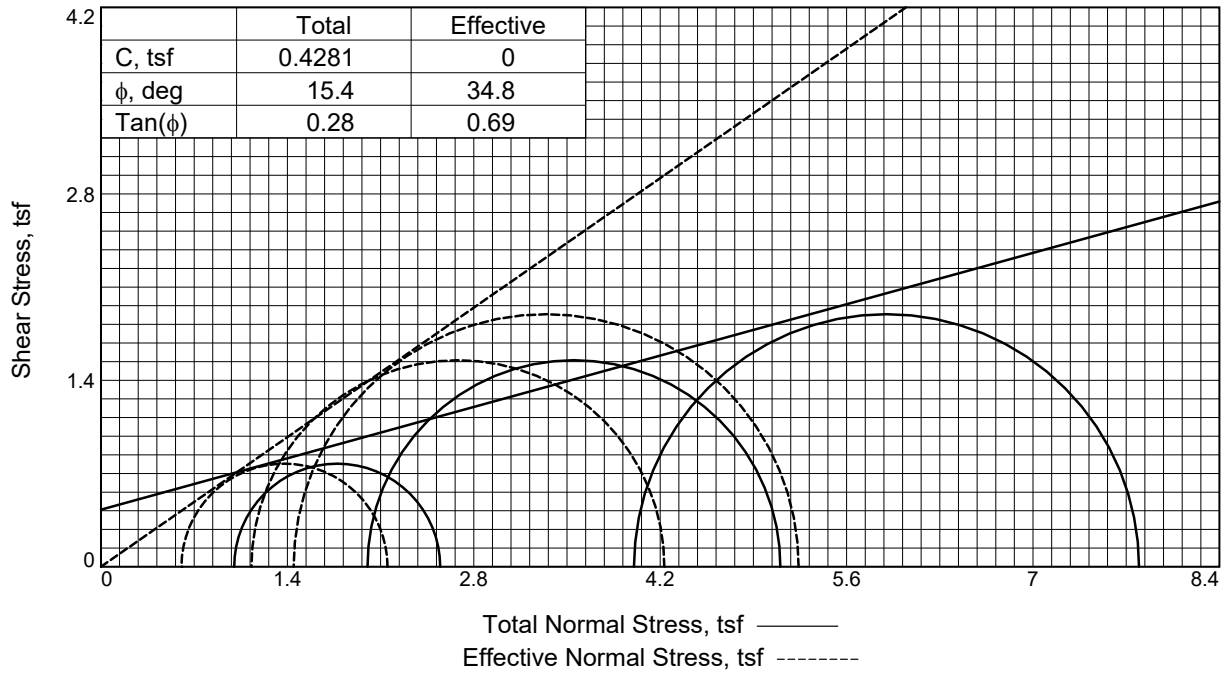
Client: Vernon County Solid Waste & Recycling Department

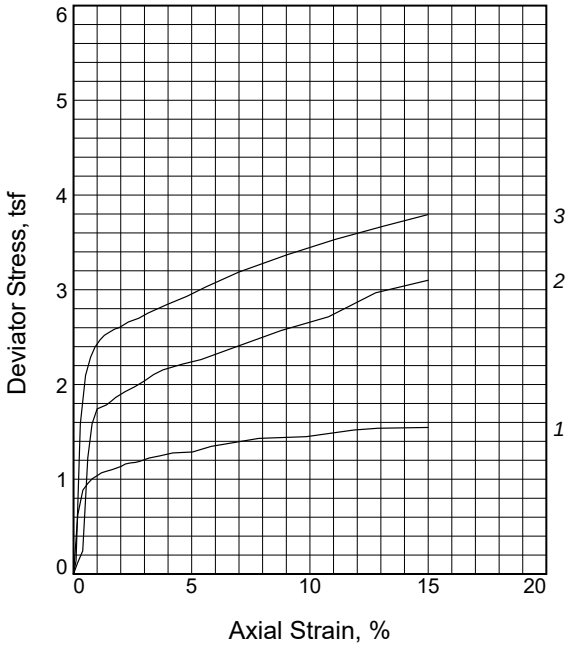
Project: Vernon County Landfill

Source of Sample: B-19 **Sample Number:** 522626

Project No.: B2205032 **Figure** _____

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Sample No.		1	2	3
Initial	Water Content, %	25.3	25.3	25.3
	Dry Density, pcf	97.6	98.6	97.4
	Saturation, %	96.0	98.4	95.5
	Void Ratio	0.7014	0.6841	0.7047
	Diameter, in.	1.420	1.410	1.403
	Height, in.	2.793	2.803	2.814
At Test	Water Content, %	25.6	25.6	22.7
	Dry Density, pcf	98.8	98.8	103.6
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6814	0.6805	0.6025
	Diameter, in.	1.414	1.409	1.374
	Height, in.	2.782	2.801	2.757
Strain rate, %/min.				
Back Pressure, tsf		6.127	5.126	3.125
Cell Pressure, tsf		7.128	7.128	7.128
Fail. Stress, tsf		1.547	3.101	3.792
Total Pore Pr., tsf		6.523	5.998	5.681
Ult. Stress, tsf		1.547	3.101	3.792
Total Pore Pr., tsf		6.523	5.998	5.681
$\bar{\sigma}_1$ Failure, tsf		2.152	4.231	5.240
$\bar{\sigma}_3$ Failure, tsf		0.605	1.130	1.447

Type of Test:
CU with Pore Pressures

Sample Type: Remold

Description: Sandy Lean Clay (CL), brown

Assumed Specific Gravity= 2.66

Remarks: CU Triax ASTM D 4767

Figure _____

Client: Vernon County Solid Waste & Recycling Department

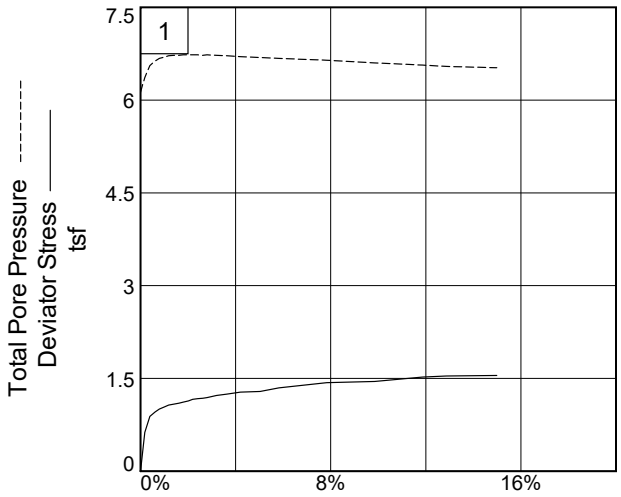
Project: Vernon County Landfill
S3705 County Road LF, Viroqua, WI

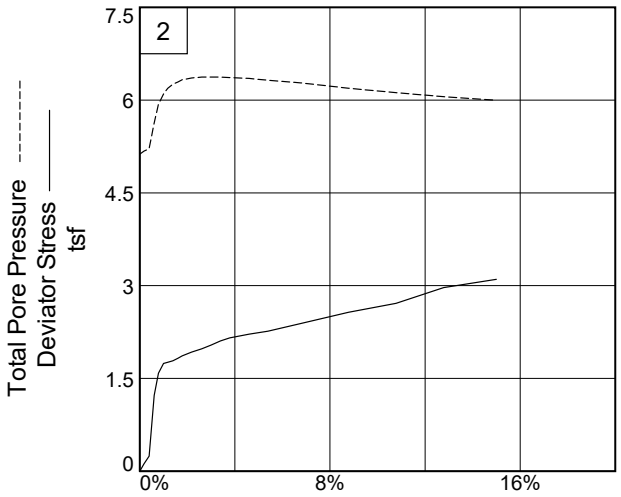
Source of Sample: B-20

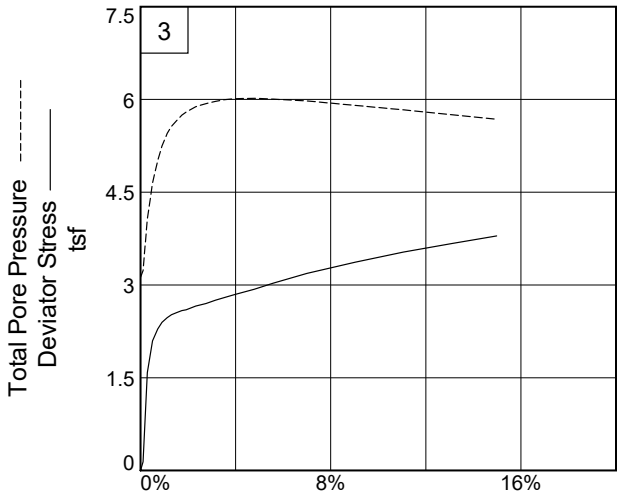
Sample Number: 522628

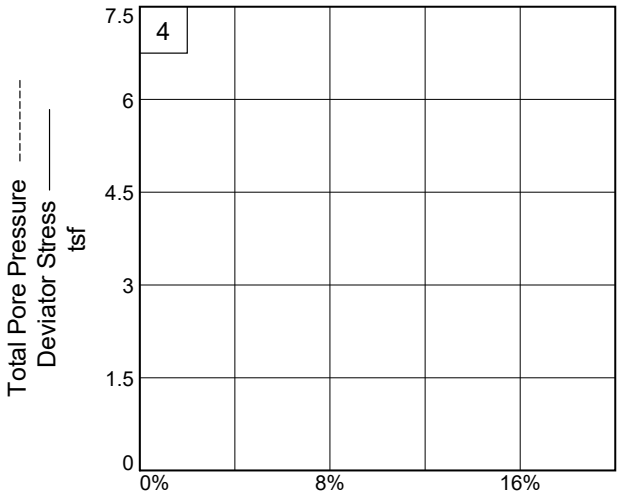
Proj. No.: B2205032 **Date Sampled:**

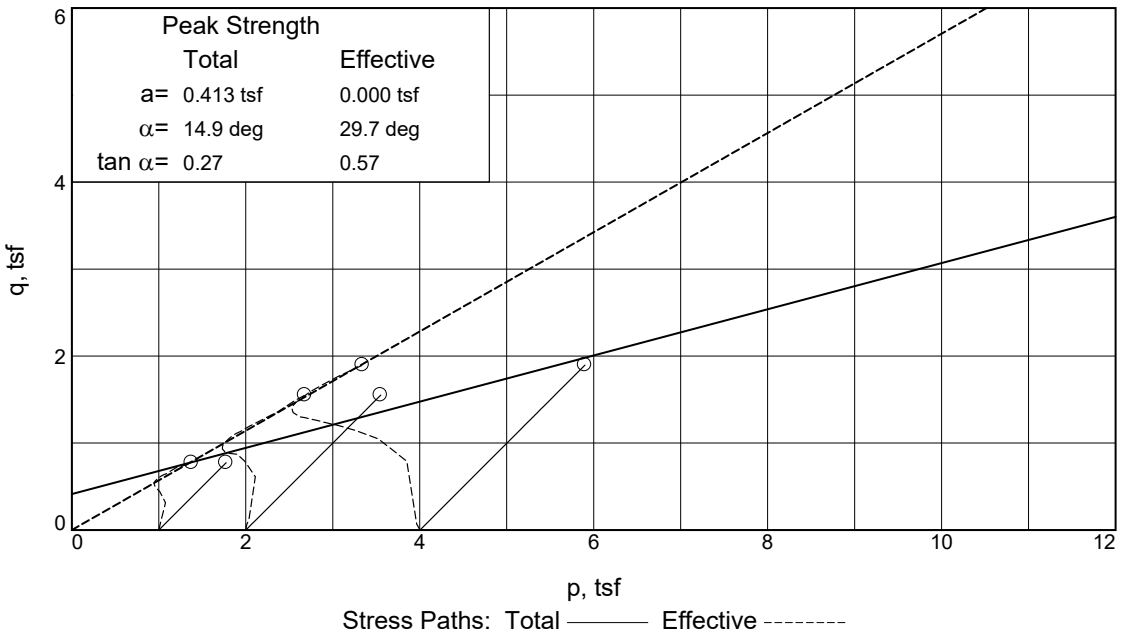
BRAUN INTERTEC











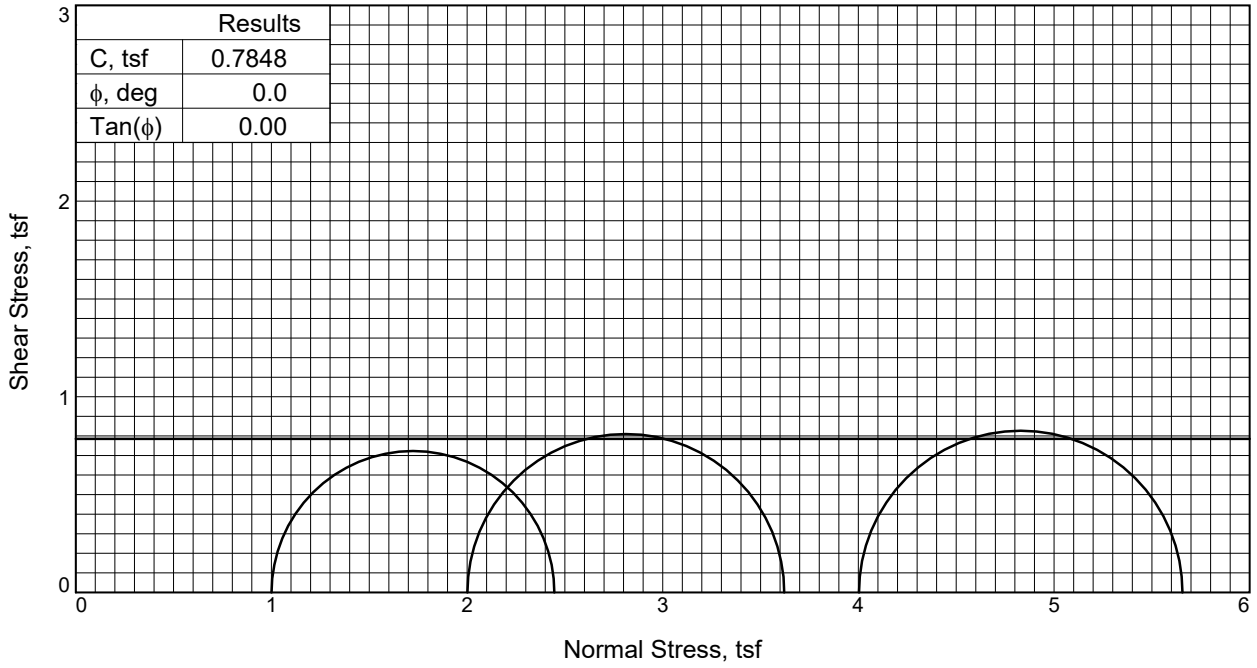
Client: Vernon County Solid Waste & Recycling Department

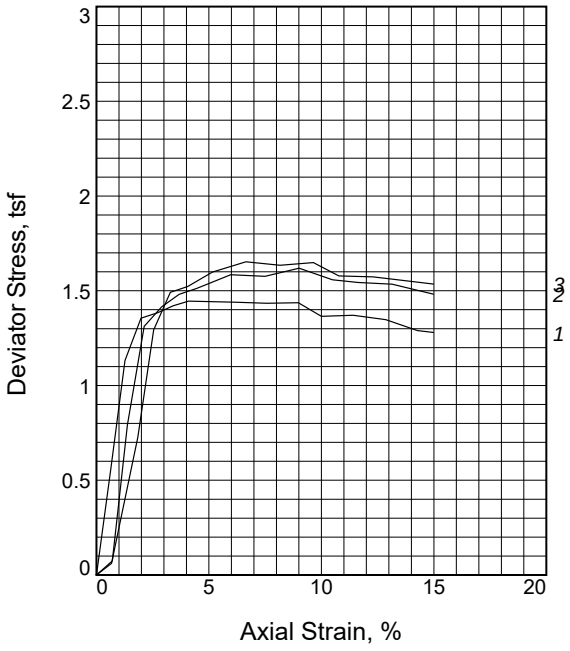
Project: Vernon County Landfill

Source of Sample: B-20 **Sample Number:** 522628

Project No.: B2205032 **Figure** _____

Braun Intertec





Sample No.		1	2	3
Initial	Water Content, %	24.8	24.8	24.8
	Dry Density, pcf	96.3	95.7	96.3
	Saturation, %	90.7	89.3	90.7
	Void Ratio	0.7303	0.7422	0.7307
	Diameter, in.	1.436	1.430	1.430
	Height, in.	2.830	2.830	2.830
At Test	Water Content, %	27.4	27.8	27.4
	Dry Density, pcf	96.3	95.7	96.3
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.7303	0.7422	0.7307
	Diameter, in.	1.436	1.430	1.430
	Height, in.	2.830	2.830	2.830
Strain rate, %/min.		1.00	1.00	1.00
Back Pressure, tsf		0.000	0.000	0.000
Cell Pressure, tsf		1.001	2.002	4.003
Fail. Stress, tsf		1.445	1.619	1.653
Ult. Stress, tsf		1.280	1.482	1.535
σ_1 Failure, tsf		2.446	3.621	5.656
σ_3 Failure, tsf		1.001	2.002	4.003

Type of Test:
Unconsolidated Undrained

Sample Type: Remold

Description: Fat Clay (CH), brown

Assumed Specific Gravity= 2.67

Remarks: UU Triax ASTM D 2850

Figure _____

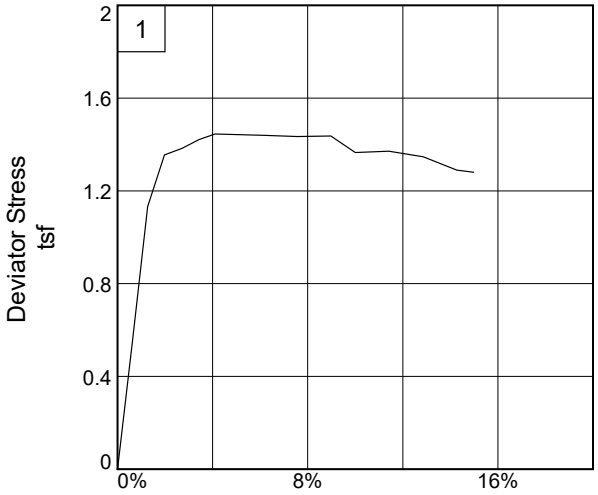
Client: Vernon County Solid Waste & Recycling Department

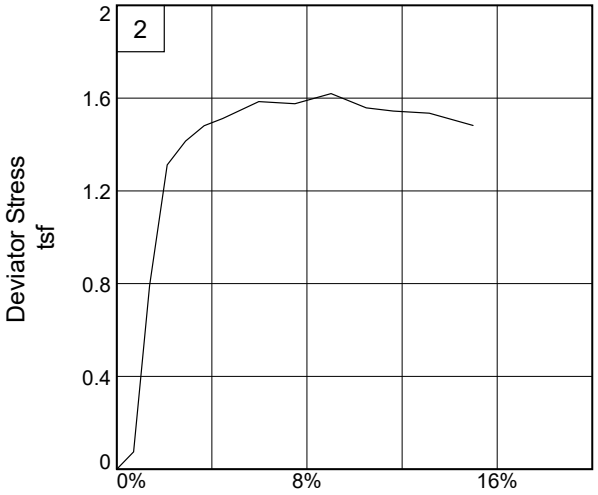
Project: Vernon County Landfill
S3705 County Road LF, Viroqua, WI

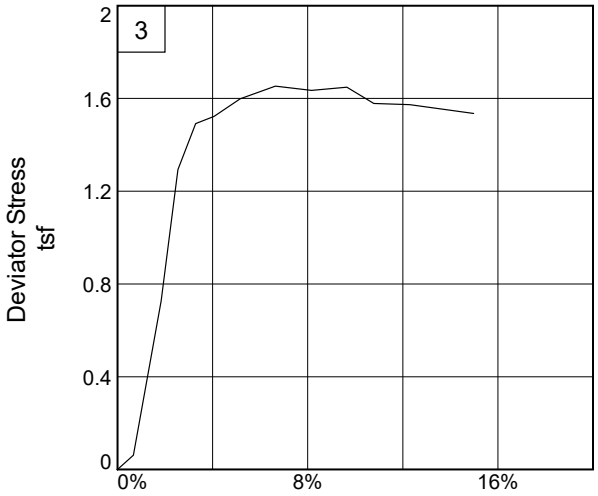
Source of Sample: B-19

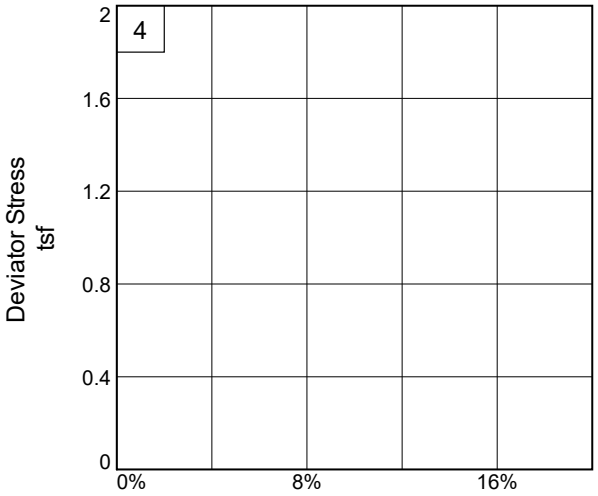
Proj. No.: B2205032 **Date Sampled:**

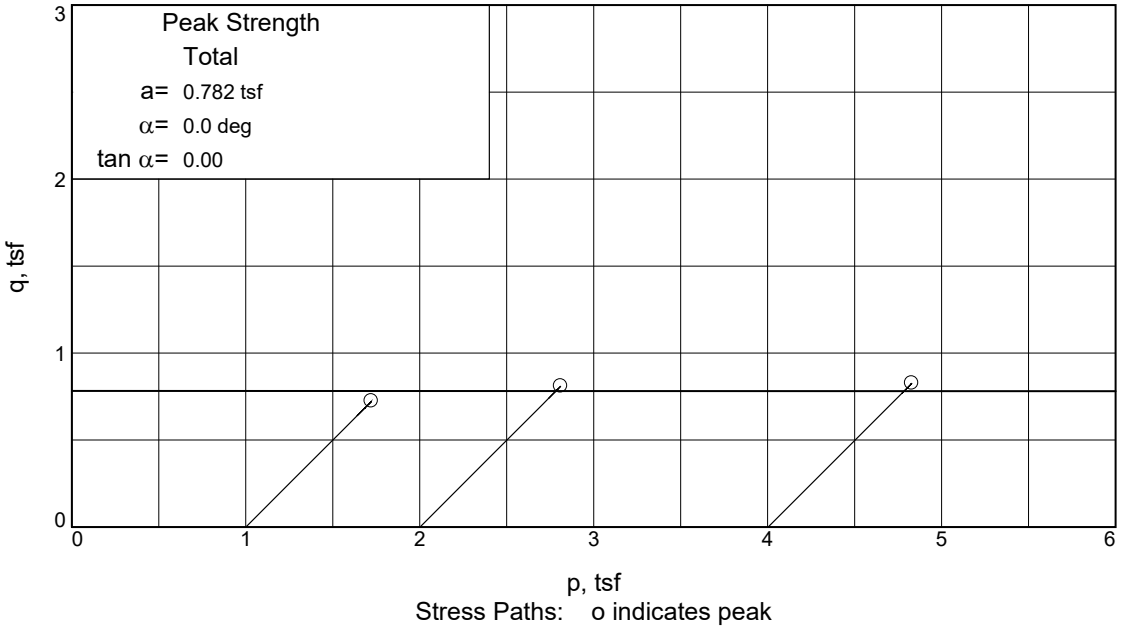
BRAUN INTERTEC











Stress Paths: o indicates peak

Client: Vernon County Solid Waste & Recycling Department

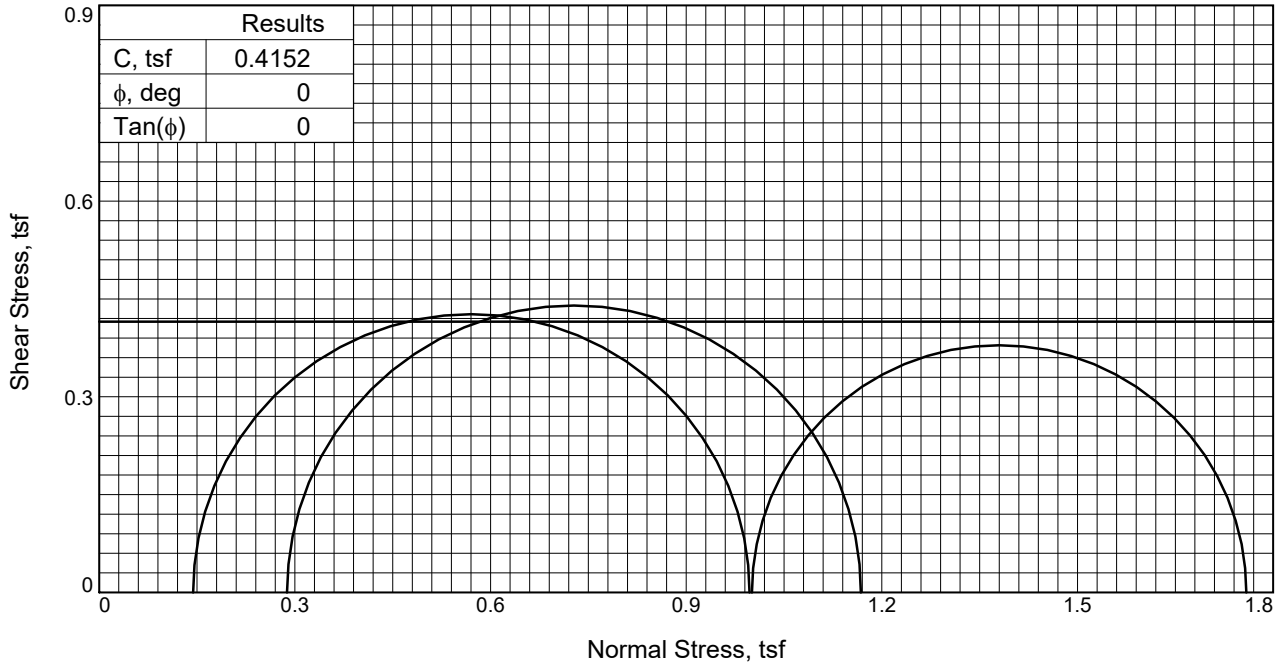
Project: Vernon County Landfill

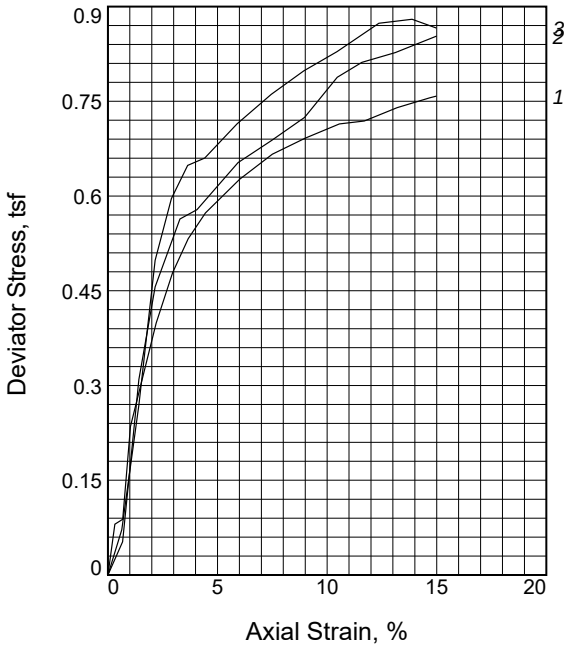
Source of Sample: B-19

Project No.: B2205032

Figure _____

Braun Intertec





Sample No.		1	2	3
Initial	Water Content, %	25.7	25.5	25.8
	Dry Density, pcf	95.2	94.7	94.8
	Saturation, %	92.0	90.2	91.4
	Void Ratio	0.7443	0.7531	0.7517
	Diameter, in.	1.430	1.430	1.420
	Height, in.	2.813	2.830	2.832
At Test	Water Content, %	28.0	28.3	28.3
	Dry Density, pcf	95.2	94.7	94.8
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.7443	0.7531	0.7517
	Diameter, in.	1.430	1.430	1.420
	Height, in.	2.813	2.830	2.832
Strain rate, %/min.		1.00	1.00	1.00
Back Pressure, tsf		0.000	0.000	0.000
Cell Pressure, tsf		1.001	0.144	0.288
Fail. Stress, tsf		0.758	0.853	0.880
Ult. Stress, tsf		0.758	0.853	0.866
σ_1 Failure, tsf		1.759	0.997	1.168
σ_3 Failure, tsf		1.001	0.144	0.288

Type of Test:
Unconsolidated Undrained

Sample Type: Remold

Description: Sandy Lean Clay (CL), brown

Assumed Specific Gravity= 2.66

Remarks: UU Triax ASTM D 2850

Figure _____

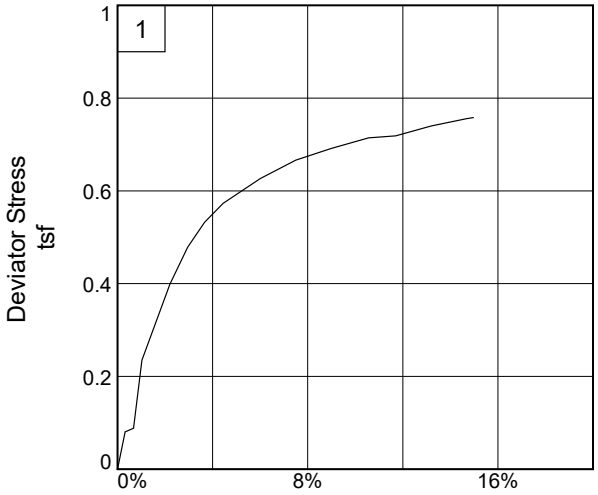
Client: Vernon County Solid Waste & Recycling Department

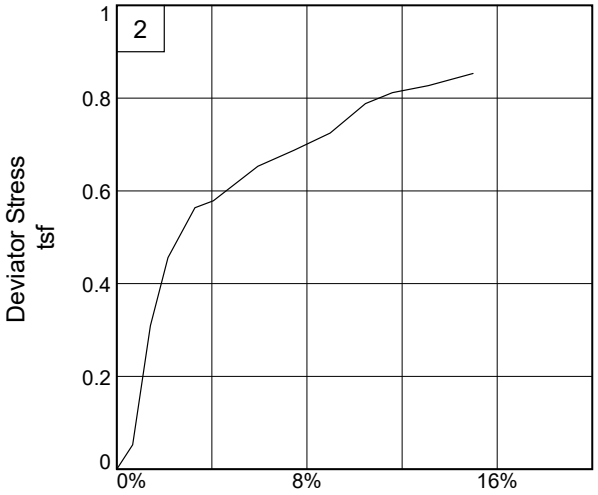
Project: Vernon County Landfill
S3705 County Road LF, Viroqua, WI

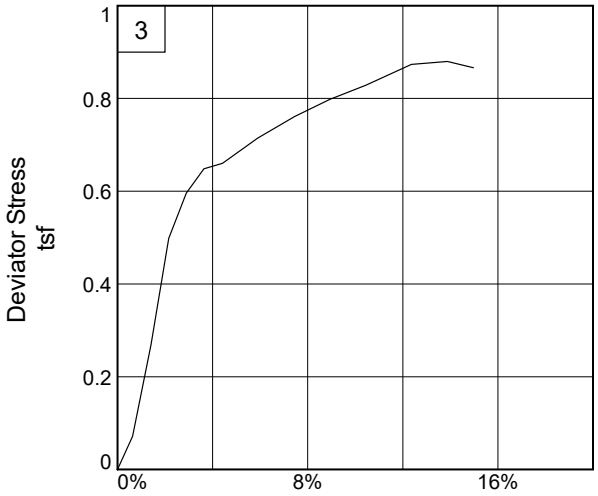
Source of Sample: B-20

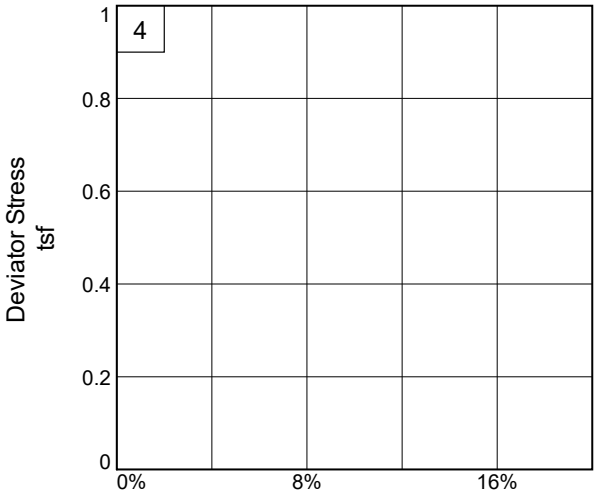
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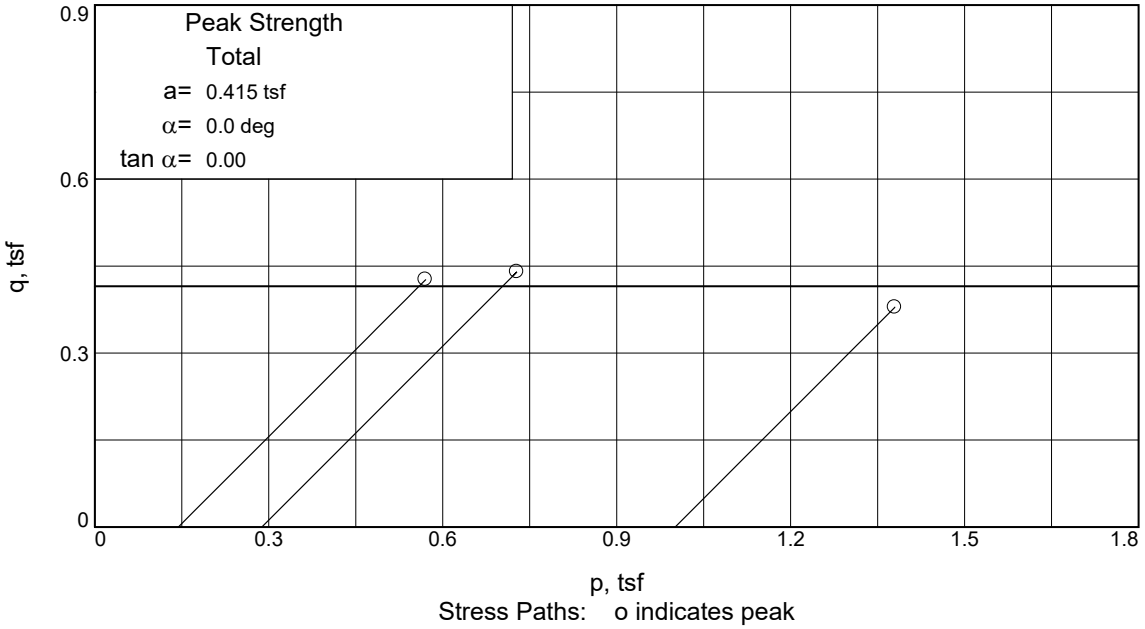
BRAUN INTERTEC











Stress Paths: o indicates peak

Client: Vernon County Solid Waste & Recycling Department

Project: Vernon County Landfill

Source of Sample: B-20

Project No.: B2205032

Figure _____

Braun Intertec

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Attachment G

Post Well Development Laboratory Report

eurofins | Environment Testing

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

ANALYTICAL REPORT

PREPARED FOR

Attn: Stacie Sanborn
Vernon County Solid Waste & Recycling
S3705 County Road LF
Viroqua, Wisconsin 54665

Generated 12/5/2022 9:27:31 AM

JOB DESCRIPTION

Vernon County Landfill Expansion

JOB NUMBER

500-224890-1

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

myEOL

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Authorization



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Authorized for release by
Sandie Fredrick, Project Manager II
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

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Job ID: 500-224890-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-224890-1

Comments
No additional comments.

Receipt
The samples were received on 11/4/2022 9:55 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.3º C.

GC/MS VOA
Method 8260B: The laboratory control sample (LCS) for analytical batch 500-684937 recovered outside control limits for the following analytes: Bromomethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method 8260B: The continuing calibration verification (CCV) associated with batch 500-684937 recovered above the upper control limit for Bromomethane and Chloroethane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: Water Tank (500-224890-4) and TRIP BLANK (500-224890-5).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-224890-1

Client Sample ID: MW-14WT — Lab Sample ID: 500-224890-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Total Suspended Solids	289		22.7	8.8	mg/L	1		SM 2540D	Total/NA
Chemical Oxygen Demand	10		10.0	6.0	mg/L	1		SM 5220C	Total/NA

Client Sample ID: MW-16 — Lab Sample ID: 500-224890-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Total Suspended Solids	273		35.7	13.8	mg/L	1		SM 2540D	Total/NA
Chemical Oxygen Demand	11.5		10.0	6.0	mg/L	1		SM 5220C	Total/NA

Client Sample ID: MW-17WT — Lab Sample ID: 500-224890-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Total Suspended Solids	58.4		5.6	2.1	mg/L	1		SM 2540D	Total/NA
Chemical Oxygen Demand	11.0		10.0	6.0	mg/L	1		SM 5220C	Total/NA

Client Sample ID: Water Tank — Lab Sample ID: 500-224890-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Chloroform	0.44	J	2.0	0.37	ug/L	1		8260B	Total/NA
1,1,2,2-Tetrachloroethane	0.81	J	1.0	0.40	ug/L	1		8260B	Total/NA

Client Sample ID: TRIP BLANK — Lab Sample ID: 500-224890-5

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.21	J	0.50	0.16	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-224890-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	EET CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	EET CHI
SM 5220C	COD	SM	EET CHI
5030B	Purge and Trap	SW846	EET CHI
SM 5220	COD	SM	EET CHI

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-224890-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-224890-1	MW-14WT	Water	11/02/22 14:00	11/04/22 09:55
500-224890-2	MW-16	Water	11/02/22 14:50	11/04/22 09:55
500-224890-3	MW-17WT	Water	11/02/22 15:20	11/04/22 09:55
500-224890-4	Water Tank	Water	11/02/22 15:30	11/04/22 09:55
500-224890-5	TRIP BLANK	Water	11/02/22 00:00	11/04/22 09:55

Client Sample Results

Client: Vernon County Solid Waste & Recycling
Job ID: 500-224890-1
Project/Site: Vernon County Landfill Expansion

Client Sample ID: MW-14WT
Lab Sample ID: 500-224890-1
Date Collected: 11/02/22 14:00
Matrix: Water
Date Received: 11/04/22 09:55

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (SM 2540D)	289		22.7	8.8	mg/L			11/08/22 10:47	1
Chemical Oxygen Demand (SM 5220C)	10		10.0	6.0	mg/L		11/23/22 10:30	11/23/22 14:05	1

Client Sample Results

Client: Vernon County Solid Waste & Recycling
Job ID: 500-224890-1
Project/Site: Vernon County Landfill Expansion

Client Sample ID: MW-16
Date Collected: 11/02/22 14:50
Date Received: 11/04/22 09:55

Lab Sample ID: 500-224890-2
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (SM 2540D)	273		35.7	13.8	mg/L			11/08/22 10:50	1
Chemical Oxygen Demand (SM 5220C)	11.5		10.0	6.0	mg/L		11/23/22 10:30	11/23/22 14:05	1

Client: Vernon County Solid Waste & Recycling
Job ID: 500-224890-1
Project/Site: Vernon County Landfill Expansion

Client Sample ID: MW-17WT
Lab Sample ID: 500-224890-3
Date Collected: 11/02/22 15:20
Matrix: Water
Date Received: 11/04/22 09:55

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (SM 2540D)	58.4		5.6	2.1	mg/L			11/08/22 10:53	1
Chemical Oxygen Demand (SM 5220C)	11.0		10.0	6.0	mg/L		11/23/22 10:30	11/23/22 14:05	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-224890-1

Client Sample ID: Water Tank
Date Collected: 11/02/22 15:30
Date Received: 11/04/22 09:55

Lab Sample ID: 500-224890-4
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			11/15/22 16:55	1
Bromobenzene	<0.36		1.0	0.36	ug/L			11/15/22 16:55	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			11/15/22 16:55	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			11/15/22 16:55	1
Bromoform	<0.48		1.0	0.48	ug/L			11/15/22 16:55	1
Bromomethane	<0.80	^c *	3.0	0.80	ug/L			11/15/22 16:55	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			11/15/22 16:55	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			11/15/22 16:55	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			11/15/22 16:55	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			11/15/22 16:55	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			11/15/22 16:55	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			11/15/22 16:55	1
Chloroethane	<0.51	^c	1.0	0.51	ug/L			11/15/22 16:55	1
Chloroform	**0.44**	**J**	2.0	0.37	ug/L			11/15/22 16:55	1
Chloromethane	<0.32		1.0	0.32	ug/L			11/15/22 16:55	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			11/15/22 16:55	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			11/15/22 16:55	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			11/15/22 16:55	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			11/15/22 16:55	1
Dibromomethane	<0.27		1.0	0.27	ug/L			11/15/22 16:55	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			11/15/22 16:55	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			11/15/22 16:55	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			11/15/22 16:55	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			11/15/22 16:55	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			11/15/22 16:55	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			11/15/22 16:55	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			11/15/22 16:55	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			11/15/22 16:55	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			11/15/22 16:55	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			11/15/22 16:55	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			11/15/22 16:55	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			11/15/22 16:55	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			11/15/22 16:55	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			11/15/22 16:55	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			11/15/22 16:55	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			11/15/22 16:55	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			11/15/22 16:55	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			11/15/22 16:55	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			11/15/22 16:55	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			11/15/22 16:55	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			11/15/22 16:55	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			11/15/22 16:55	1
Naphthalene	<0.34		1.0	0.34	ug/L			11/15/22 16:55	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			11/15/22 16:55	1
Styrene	<0.39		1.0	0.39	ug/L			11/15/22 16:55	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			11/15/22 16:55	1
1,1,2,2-Tetrachloroethane	**0.81**	**J**	1.0	0.40	ug/L			11/15/22 16:55	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			11/15/22 16:55	1
Toluene	<0.15		0.50	0.15	ug/L			11/15/22 16:55	1

Client: Vernon County Solid Waste & Recycling
Job ID: 500-224890-1
Project/Site: Vernon County Landfill Expansion

Client Sample ID: Water Tank
Lab Sample ID: 500-224890-4

Date Collected: 11/02/22 15:30
Matrix: Water
Date Received: 11/04/22 09:55

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			11/15/22 16:55	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			11/15/22 16:55	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			11/15/22 16:55	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			11/15/22 16:55	1
Trichloroethene	<0.16		0.50	0.16	ug/L			11/15/22 16:55	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			11/15/22 16:55	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			11/15/22 16:55	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			11/15/22 16:55	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			11/15/22 16:55	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			11/15/22 16:55	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			11/15/22 16:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 126*		*11/15/22 16:55*	*1*
Toluene-d8 (Surr)	*97*		*75 - 120*		*11/15/22 16:55*	*1*
4-Bromofluorobenzene (Surr)	*86*		*72 - 124*		*11/15/22 16:55*	*1*
Dibromofluoromethane (Surr)	*102*		*75 - 120*		*11/15/22 16:55*	*1*

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (SM 2540D)	<1.9		5.0	1.9	mg/L			11/09/22 10:36	1
Chemical Oxygen Demand (SM 5220C)	<6.0		10.0	6.0	mg/L		11/23/22 10:30	11/23/22 14:05	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-224890-1

Client Sample ID: TRIP BLANK

Date Collected: 11/02/22 00:00
Date Received: 11/04/22 09:55

Lab Sample ID: 500-224890-5

Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			11/15/22 17:19	1
Bromobenzene	<0.36		1.0	0.36	ug/L			11/15/22 17:19	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			11/15/22 17:19	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			11/15/22 17:19	1
Bromoform	<0.48		1.0	0.48	ug/L			11/15/22 17:19	1
Bromomethane	<0.80	^c *	3.0	0.80	ug/L			11/15/22 17:19	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			11/15/22 17:19	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			11/15/22 17:19	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			11/15/22 17:19	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			11/15/22 17:19	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			11/15/22 17:19	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			11/15/22 17:19	1
Chloroethane	<0.51	^c	1.0	0.51	ug/L			11/15/22 17:19	1
Chloroform	<0.37		2.0	0.37	ug/L			11/15/22 17:19	1
Chloromethane	<0.32		1.0	0.32	ug/L			11/15/22 17:19	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			11/15/22 17:19	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			11/15/22 17:19	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			11/15/22 17:19	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			11/15/22 17:19	1
Dibromomethane	<0.27		1.0	0.27	ug/L			11/15/22 17:19	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			11/15/22 17:19	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			11/15/22 17:19	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			11/15/22 17:19	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			11/15/22 17:19	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			11/15/22 17:19	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			11/15/22 17:19	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			11/15/22 17:19	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			11/15/22 17:19	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			11/15/22 17:19	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			11/15/22 17:19	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			11/15/22 17:19	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			11/15/22 17:19	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			11/15/22 17:19	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			11/15/22 17:19	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			11/15/22 17:19	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			11/15/22 17:19	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			11/15/22 17:19	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			11/15/22 17:19	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			11/15/22 17:19	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			11/15/22 17:19	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			11/15/22 17:19	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			11/15/22 17:19	1
Naphthalene	<0.34		1.0	0.34	ug/L			11/15/22 17:19	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			11/15/22 17:19	1
Styrene	<0.39		1.0	0.39	ug/L			11/15/22 17:19	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			11/15/22 17:19	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			11/15/22 17:19	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			11/15/22 17:19	1
Toluene	<0.15		0.50	0.15	ug/L			11/15/22 17:19	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-224890-1

Client Sample ID: TRIP BLANK
Date Collected: 11/02/22 00:00
Date Received: 11/04/22 09:55

Lab Sample ID: 500-224890-5
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			11/15/22 17:19	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			11/15/22 17:19	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			11/15/22 17:19	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			11/15/22 17:19	1
Trichloroethene	**0.21**	**J**	0.50	0.16	ug/L			11/15/22 17:19	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			11/15/22 17:19	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			11/15/22 17:19	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			11/15/22 17:19	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			11/15/22 17:19	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			11/15/22 17:19	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			11/15/22 17:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 126*		*11/15/22 17:19*	*1*
Toluene-d8 (Surr)	*97*		*75 - 120*		*11/15/22 17:19*	*1*
4-Bromofluorobenzene (Surr)	*87*		*72 - 124*		*11/15/22 17:19*	*1*
Dibromofluoromethane (Surr)	*103*		*75 - 120*		*11/15/22 17:19*	*1*

Definitions/Glossary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-224890-1
Project/Site: Vernon County Landfill Expansion

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
^c	CCV Recovery is outside acceptance limits.
J	Reported value was between the limit of detection and the limit of quantitation.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client: Vernon County Solid Waste & Recycling
Job ID: 500-224890-1
Project/Site: Vernon County Landfill Expansion

GC/MS VOA

Analysis Batch: 684937

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-224890-4	Water Tank	Total/NA	Water	8260B	
500-224890-5	TRIP BLANK	Total/NA	Water	8260B	
MB 500-684937/6	Method Blank	Total/NA	Water	8260B	
LCS 500-684937/4	Lab Control Sample	Total/NA	Water	8260B	

General Chemistry

Analysis Batch: 683701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-224890-1	MW-14WT	Total/NA	Water	SM 2540D	
500-224890-2	MW-16	Total/NA	Water	SM 2540D	
500-224890-3	MW-17WT	Total/NA	Water	SM 2540D	
MB 500-683701/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 500-683701/2	Lab Control Sample	Total/NA	Water	SM 2540D	

Analysis Batch: 683968

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-224890-4	Water Tank	Total/NA	Water	SM 2540D	
MB 500-683968/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 500-683968/2	Lab Control Sample	Total/NA	Water	SM 2540D	
500-224890-4 DU	Water Tank	Total/NA	Water	SM 2540D	

Prep Batch: 686677

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-224890-1	MW-14WT	Total/NA	Water	SM 5220	
500-224890-2	MW-16	Total/NA	Water	SM 5220	
500-224890-3	MW-17WT	Total/NA	Water	SM 5220	
500-224890-4	Water Tank	Total/NA	Water	SM 5220	
MB 500-686677/1-A	Method Blank	Total/NA	Water	SM 5220	
LCS 500-686677/2-A	Lab Control Sample	Total/NA	Water	SM 5220	

Analysis Batch: 686679

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-224890-1	MW-14WT	Total/NA	Water	SM 5220C	686677
500-224890-2	MW-16	Total/NA	Water	SM 5220C	686677
500-224890-3	MW-17WT	Total/NA	Water	SM 5220C	686677
500-224890-4	Water Tank	Total/NA	Water	SM 5220C	686677
MB 500-686677/1-A	Method Blank	Total/NA	Water	SM 5220C	686677
LCS 500-686677/2-A	Lab Control Sample	Total/NA	Water	SM 5220C	686677

Surrogate Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-224890-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	TOL	BFB	DBFM
Lab Sample ID	Client Sample ID	(75-126)	(75-120)	(72-124)	(75-120)
500-224890-4	Water Tank	91	97	86	102
500-224890-5	TRIP BLANK	93	97	87	103
LCS 500-684937/4	Lab Control Sample	87	98	84	97
MB 500-684937/6	Method Blank	89	97	87	100

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-684937/6
Matrix: Water
Analysis Batch: 684937

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			11/15/22 10:59	1
Bromobenzene	<0.36		1.0	0.36	ug/L			11/15/22 10:59	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			11/15/22 10:59	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			11/15/22 10:59	1
Bromoform	<0.48		1.0	0.48	ug/L			11/15/22 10:59	1
Bromomethane	<0.80		3.0	0.80	ug/L			11/15/22 10:59	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			11/15/22 10:59	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			11/15/22 10:59	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			11/15/22 10:59	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			11/15/22 10:59	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			11/15/22 10:59	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			11/15/22 10:59	1
Chloroethane	<0.51		1.0	0.51	ug/L			11/15/22 10:59	1
Chloroform	<0.37		2.0	0.37	ug/L			11/15/22 10:59	1
Chloromethane	<0.32		1.0	0.32	ug/L			11/15/22 10:59	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			11/15/22 10:59	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			11/15/22 10:59	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			11/15/22 10:59	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			11/15/22 10:59	1
Dibromomethane	<0.27		1.0	0.27	ug/L			11/15/22 10:59	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			11/15/22 10:59	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			11/15/22 10:59	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			11/15/22 10:59	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			11/15/22 10:59	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			11/15/22 10:59	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			11/15/22 10:59	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			11/15/22 10:59	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			11/15/22 10:59	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			11/15/22 10:59	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			11/15/22 10:59	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			11/15/22 10:59	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			11/15/22 10:59	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			11/15/22 10:59	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			11/15/22 10:59	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			11/15/22 10:59	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			11/15/22 10:59	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			11/15/22 10:59	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			11/15/22 10:59	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			11/15/22 10:59	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			11/15/22 10:59	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			11/15/22 10:59	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			11/15/22 10:59	1
Naphthalene	<0.34		1.0	0.34	ug/L			11/15/22 10:59	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			11/15/22 10:59	1
Styrene	<0.39		1.0	0.39	ug/L			11/15/22 10:59	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			11/15/22 10:59	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			11/15/22 10:59	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			11/15/22 10:59	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 500-684937/6
Matrix: Water
Analysis Batch: 684937

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	<0.15		0.50	0.15	ug/L			11/15/22 10:59	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			11/15/22 10:59	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			11/15/22 10:59	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			11/15/22 10:59	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			11/15/22 10:59	1
Trichloroethene	<0.16		0.50	0.16	ug/L			11/15/22 10:59	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			11/15/22 10:59	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			11/15/22 10:59	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			11/15/22 10:59	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			11/15/22 10:59	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			11/15/22 10:59	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			11/15/22 10:59	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 126*		*11/15/22 10:59*	*1*
Toluene-d8 (Surr)	*97*		*75 - 120*		*11/15/22 10:59*	*1*
4-Bromofluorobenzene (Surr)	*87*		*72 - 124*		*11/15/22 10:59*	*1*
Dibromofluoromethane (Surr)	*100*		*75 - 120*		*11/15/22 10:59*	*1*

Lab Sample ID: LCS 500-684937/4
Matrix: Water
Analysis Batch: 684937

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	50.0	46.2		ug/L		92	70 - 120
Bromobenzene	50.0	45.0		ug/L		90	70 - 122
Bromochloromethane	50.0	46.2		ug/L		92	65 - 122
Bromodichloromethane	50.0	49.1		ug/L		98	69 - 120
Bromoform	50.0	54.2		ug/L		108	56 - 132
Bromomethane	50.0	83.4	*	ug/L		167	40 - 152
n-Butylbenzene	50.0	48.9		ug/L		98	68 - 125
sec-Butylbenzene	50.0	47.2		ug/L		94	70 - 123
tert-Butylbenzene	50.0	46.7		ug/L		93	70 - 121
Carbon tetrachloride	50.0	49.0		ug/L		98	59 - 133
Chlorobenzene	50.0	48.1		ug/L		96	70 - 120
Dibromochloromethane	50.0	53.5		ug/L		107	68 - 125
Chloroethane	50.0	52.6		ug/L		105	48 - 136
Chloroform	50.0	44.0		ug/L		88	70 - 120
Chloromethane	50.0	53.3		ug/L		107	56 - 152
2-Chlorotoluene	50.0	43.4		ug/L		87	70 - 125
4-Chlorotoluene	50.0	47.3		ug/L		95	68 - 124
1,2-Dibromo-3-Chloropropane	50.0	43.9		ug/L		88	56 - 123
1,2-Dibromoethane	50.0	46.4		ug/L		93	70 - 125
Dibromomethane	50.0	46.5		ug/L		93	70 - 120
1,2-Dichlorobenzene	50.0	47.1		ug/L		94	70 - 125
1,3-Dichlorobenzene	50.0	45.3		ug/L		91	70 - 125
1,4-Dichlorobenzene	50.0	47.5		ug/L		95	70 - 120
Dichlorodifluoromethane	50.0	39.2		ug/L		78	40 - 159

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-684937/4
Matrix: Water
Analysis Batch: 684937

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1-Dichloroethane	50.0	44.0		ug/L		88	70 - 125
1,2-Dichloroethane	50.0	42.9		ug/L		86	68 - 127
1,1-Dichloroethene	50.0	45.9		ug/L		92	67 - 122
cis-1,2-Dichloroethene	50.0	45.6		ug/L		91	70 - 125
trans-1,2-Dichloroethene	50.0	46.9		ug/L		94	70 - 125
1,2-Dichloropropane	50.0	43.5		ug/L		87	67 - 130
1,3-Dichloropropane	50.0	46.6		ug/L		93	62 - 136
2,2-Dichloropropane	50.0	51.4		ug/L		103	58 - 139
1,1-Dichloropropene	50.0	46.1		ug/L		92	70 - 121
cis-1,3-Dichloropropene	50.0	47.4		ug/L		95	64 - 127
trans-1,3-Dichloropropene	50.0	48.0		ug/L		96	62 - 128
Ethylbenzene	50.0	48.3		ug/L		97	70 - 123
Hexachlorobutadiene	50.0	33.3		ug/L		67	51 - 150
Isopropylbenzene	50.0	45.7		ug/L		91	70 - 126
p-Isopropyltoluene	50.0	49.1		ug/L		98	70 - 125
Methylene Chloride	50.0	45.3		ug/L		91	69 - 125
Methyl tert-butyl ether	50.0	44.0		ug/L		88	55 - 123
Naphthalene	50.0	41.4		ug/L		83	53 - 144
N-Propylbenzene	50.0	47.9		ug/L		96	69 - 127
Styrene	50.0	51.1		ug/L		102	70 - 120
1,1,1,2-Tetrachloroethane	50.0	47.9		ug/L		96	70 - 125
1,1,2,2-Tetrachloroethane	50.0	47.0		ug/L		94	62 - 140
Tetrachloroethene	50.0	45.4		ug/L		91	70 - 128
Toluene	50.0	48.0		ug/L		96	70 - 125
1,2,3-Trichlorobenzene	50.0	37.4		ug/L		75	51 - 145
1,2,4-Trichlorobenzene	50.0	39.1		ug/L		78	57 - 137
1,1,1-Trichloroethane	50.0	47.3		ug/L		95	70 - 125
1,1,2-Trichloroethane	50.0	46.5		ug/L		93	71 - 130
Trichloroethene	50.0	47.3		ug/L		95	70 - 125
Trichlorofluoromethane	50.0	42.5		ug/L		85	55 - 128
1,2,3-Trichloropropane	50.0	44.9		ug/L		90	50 - 133
1,2,4-Trimethylbenzene	50.0	47.2		ug/L		94	70 - 123
1,3,5-Trimethylbenzene	50.0	47.5		ug/L		95	70 - 123
Vinyl chloride	50.0	50.9		ug/L		102	64 - 126
Xylenes, Total	100	96.9		ug/L		97	70 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 126*
Toluene-d8 (Surr)	*98*		*75 - 120*
4-Bromofluorobenzene (Surr)	*84*		*72 - 124*
Dibromofluoromethane (Surr)	*97*		*75 - 120*

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-683701/1
Matrix: Water
Analysis Batch: 683701

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<1.9		5.0	1.9	mg/L			11/08/22 09:43	1

Lab Sample ID: LCS 500-683701/2
Matrix: Water
Analysis Batch: 683701

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Suspended Solids			200	180.0		mg/L		90	80 - 120		

Lab Sample ID: MB 500-683968/1
Matrix: Water
Analysis Batch: 683968

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<1.9		5.0	1.9	mg/L			11/09/22 10:06	1

Lab Sample ID: LCS 500-683968/2
Matrix: Water
Analysis Batch: 683968

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Suspended Solids			200	199.0		mg/L		100	80 - 120		

Lab Sample ID: 500-224890-4 DU
Matrix: Water
Analysis Batch: 683968

Client Sample ID: Water Tank
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	<1.9			<1.9		mg/L				NC	5

Method: SM 5220C - COD

Lab Sample ID: MB 500-686677/1-A
Matrix: Water
Analysis Batch: 686679

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 686677

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	<6.0		10.0	6.0	mg/L		11/23/22 10:30	11/23/22 14:05	1

Lab Sample ID: LCS 500-686677/2-A
Matrix: Water
Analysis Batch: 686679

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 686677

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chemical Oxygen Demand			50.0	49.38		mg/L		99	85 - 115		

Lab Chronicle

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-224890-1

Client Sample ID: MW-14WT
Date Collected: 11/02/22 14:00
Date Received: 11/04/22 09:55

Lab Sample ID: 500-224890-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2540D		1	683701	EH	EET CHI	11/08/22 10:47 - 11/08/22 10:50 [1]
Total/NA	Prep	SM 5220			686677	LP	EET CHI	11/23/22 10:30 - 11/23/22 12:30 [1]
Total/NA	Analysis	SM 5220C		1	686679	LP	EET CHI	11/23/22 14:05

Client Sample ID: MW-16
Date Collected: 11/02/22 14:50
Date Received: 11/04/22 09:55

Lab Sample ID: 500-224890-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2540D		1	683701	EH	EET CHI	11/08/22 10:50 - 11/08/22 10:53 [1]
Total/NA	Prep	SM 5220			686677	LP	EET CHI	11/23/22 10:30 - 11/23/22 12:30 [1]
Total/NA	Analysis	SM 5220C		1	686679	LP	EET CHI	11/23/22 14:05

Client Sample ID: MW-17WT
Date Collected: 11/02/22 15:20
Date Received: 11/04/22 09:55

Lab Sample ID: 500-224890-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2540D		1	683701	EH	EET CHI	11/08/22 10:53 - 11/08/22 10:56 [1]
Total/NA	Prep	SM 5220			686677	LP	EET CHI	11/23/22 10:30 - 11/23/22 12:30 [1]
Total/NA	Analysis	SM 5220C		1	686679	LP	EET CHI	11/23/22 14:05

Client Sample ID: Water Tank
Date Collected: 11/02/22 15:30
Date Received: 11/04/22 09:55

Lab Sample ID: 500-224890-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	684937	W1T	EET CHI	11/15/22 16:55
Total/NA	Analysis	SM 2540D		1	683968	EH	EET CHI	11/09/22 10:36 - 11/09/22 10:39 [1]
Total/NA	Prep	SM 5220			686677	LP	EET CHI	11/23/22 10:30 - 11/23/22 12:30 [1]
Total/NA	Analysis	SM 5220C		1	686679	LP	EET CHI	11/23/22 14:05

Client Sample ID: TRIP BLANK
Date Collected: 11/02/22 00:00
Date Received: 11/04/22 09:55

Lab Sample ID: 500-224890-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	684937	W1T	EET CHI	11/15/22 17:19

[1] Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-224890-1
Project/Site: Vernon County Landfill Expansion

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999580010	08-31-23

Copy Brian Kent on invoice + Lab Report

Eurofins Chicago
24 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534 52 1

Chain of Custody Record

500-224890 COC

Client Information	Sampler	Lab PM: Fredrick Sandie	Carrier Tracking Nos	
Client Contact: Stacie Sanborn	Phone	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin	Page of 1
Company: Vernon County Solid Waste and Recycling Dep	PWSID	Analysis Requested		Job #: 500-224890
Address: S3705 County Road LF	Due Date Requested			Preservation Codes: A HCl; B NaOH; C Zn Acetate; D Nitric Acid; E NaHSO4; F MeOH; G Amchlor; H Ascorbic Acid; I Ice; J DI Water; K EDTA; L EDA; M Hexane; N None; O AsNaO2; P Na2O4S; Q Na2SO3; R Na2S2O3; S H2SO4; T TSP Dodecahydrate; U Acetone; V MCAA; W pH 4-5; Y Trizma; Z other (specify)
City: Viroqua	TAT Requested (days): STANDARD			
State, Zip: WI 54665	Compliance Project: Δ Yes Δ No			
Phone	PO #: Purchase Order not required			
Email: stacie.sanborn@vernoncounty.org	WO #			
Project Name: Vernon County Landfill Expansion	Project #: 50020572			
Site	SSOW#:			Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	5220C COD	2540D TSS	VOCs	Total Number of containers	Special Instructions/Note
			Preservation Code:				S	N			
1 MW-14WT	11/2/22	2:00	G	Water			✓	✓			
2 MW-16		2:50		Water			✓	✓			
3 MW-17WT		3:20		Water			✓	✓			
4 Water Tank		3:30		Water			✓	✓	✓		
5 TRIP BLANK				Water				X			
				Water							
				Water							

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	11/3/2022				
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
				11-4-22 0955	

Custody Seals Intact: ✓ Yes Δ No | Custody Seal No: 1676286

Cooler Temperature(s) and Other Remarks: 1.8-1.3

ORIGIN ID:PHDA (715) 720-6200
MR. MIKE ROHLIK
SHORT ELLIOTT HENDRICKSON, INC. DBA
17424 108TH AVE.

CHIPPEWA FALLS, WI 54729
UNITED STATES US

SHIP DATE: 15SEP21
ACTWGT: 10.00 LB
CAD: 0562071/CAFE3506

TO

EUROFINS TESTAMERICA CHICAGO
2417 BOND STREET

UNIVERSITY PARK IL 604843101
(708) 534-5200
REF: $500 95091

RMA:

FedEx Express

TRK# 0221 5174 1266 8831

RETURNS MON-SAT
PRIORITY OVERNIGHT

FedEx
TRK# 0221 5174 1266 8831

FRI - 04 NOV 10:30A
PRIORITY OVERNIGHT

500-224890 Waybi

Login Sample Receipt Checklist

Client: Vernon County Solid Waste & Recycling

Job Number: 500-224890-1

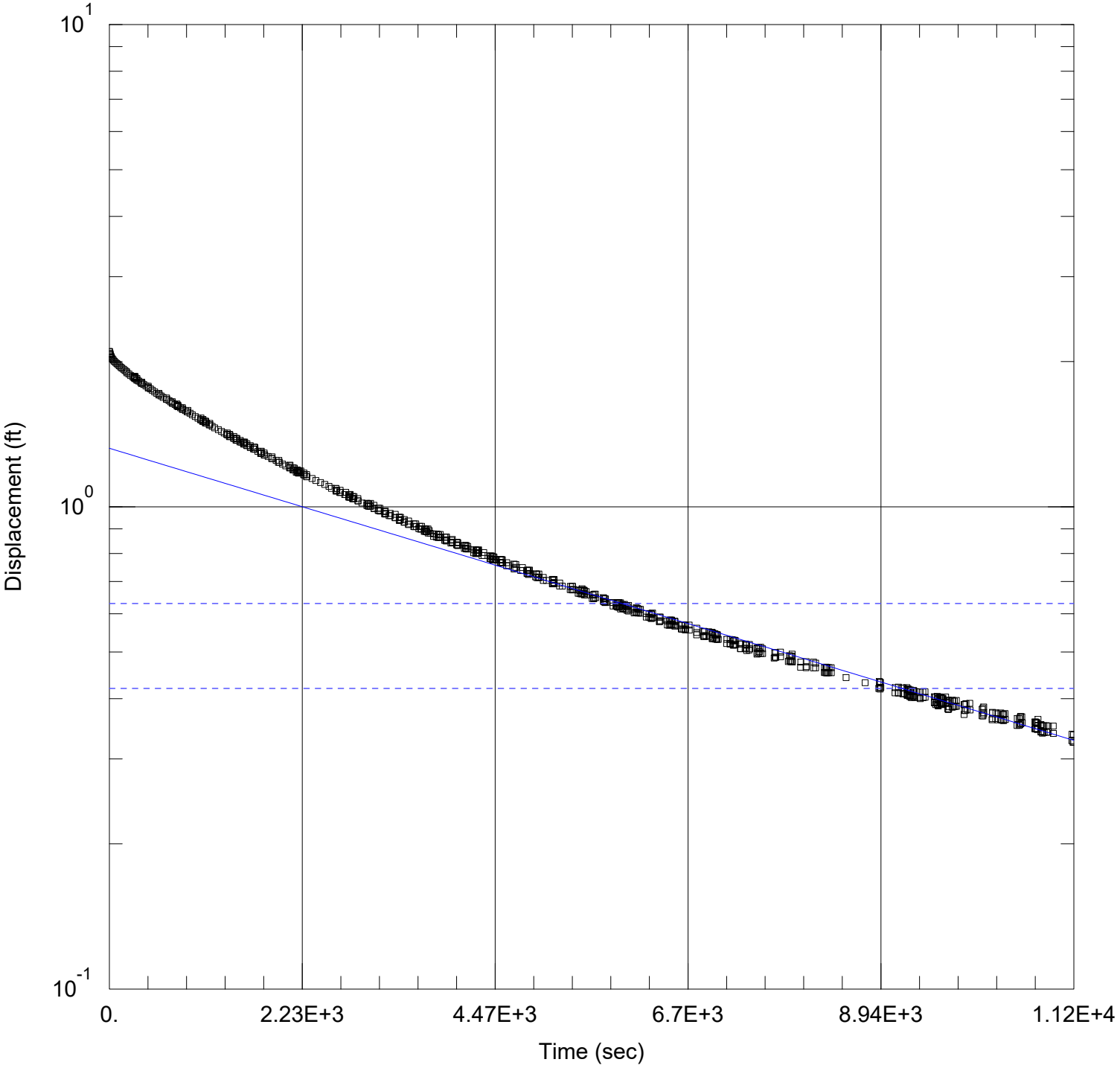
Login Number: 224890
List Number: 1
Creator: James, Jeff A

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.3
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Attachment H

In-Field Hydraulic Conductivity Results



MW-17WT RISING HEAD TEST

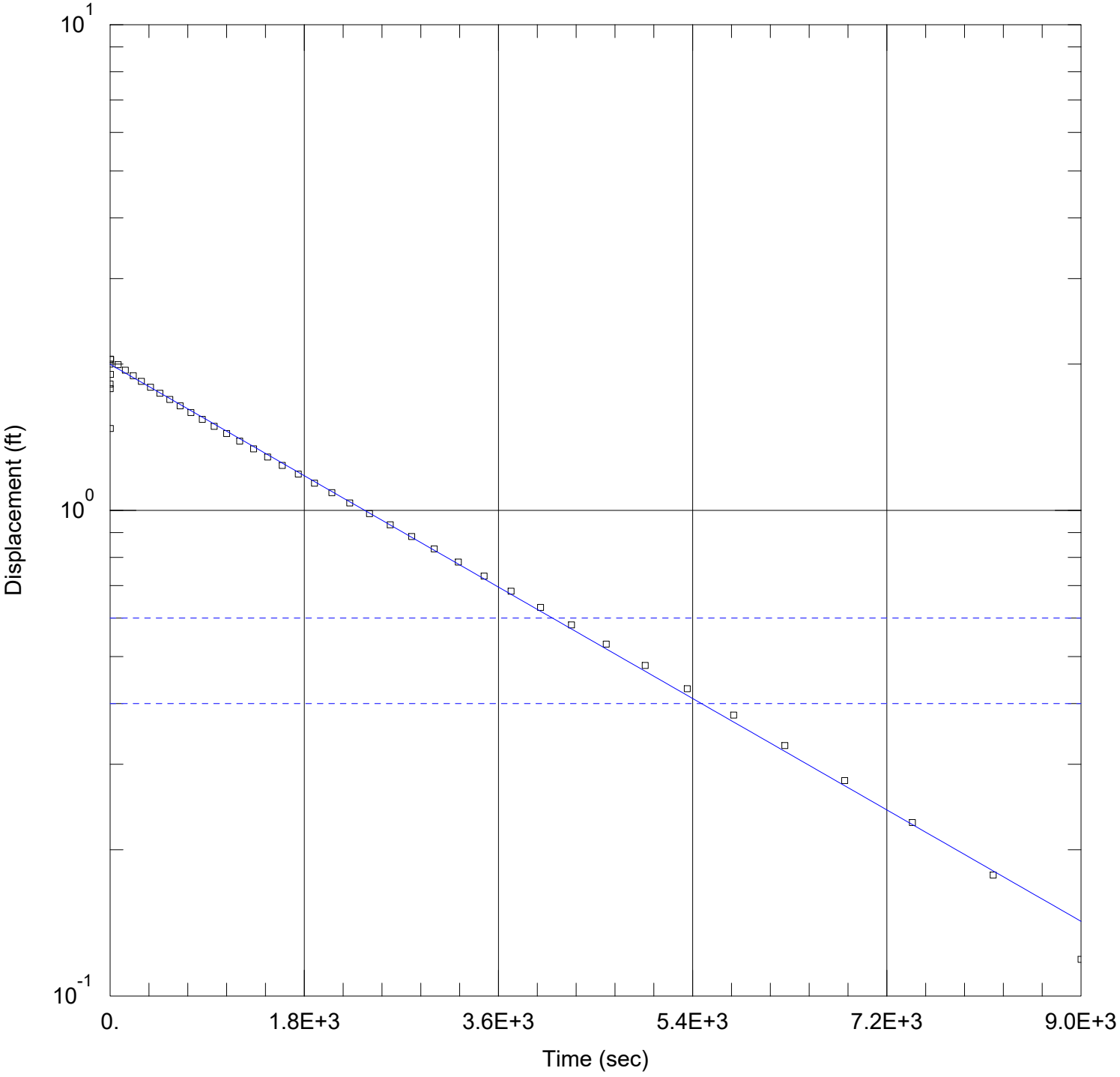
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 1.035E-5 cm/sec

y0 = 1.322 ft



MW-17WT FALLING HEAD TEST

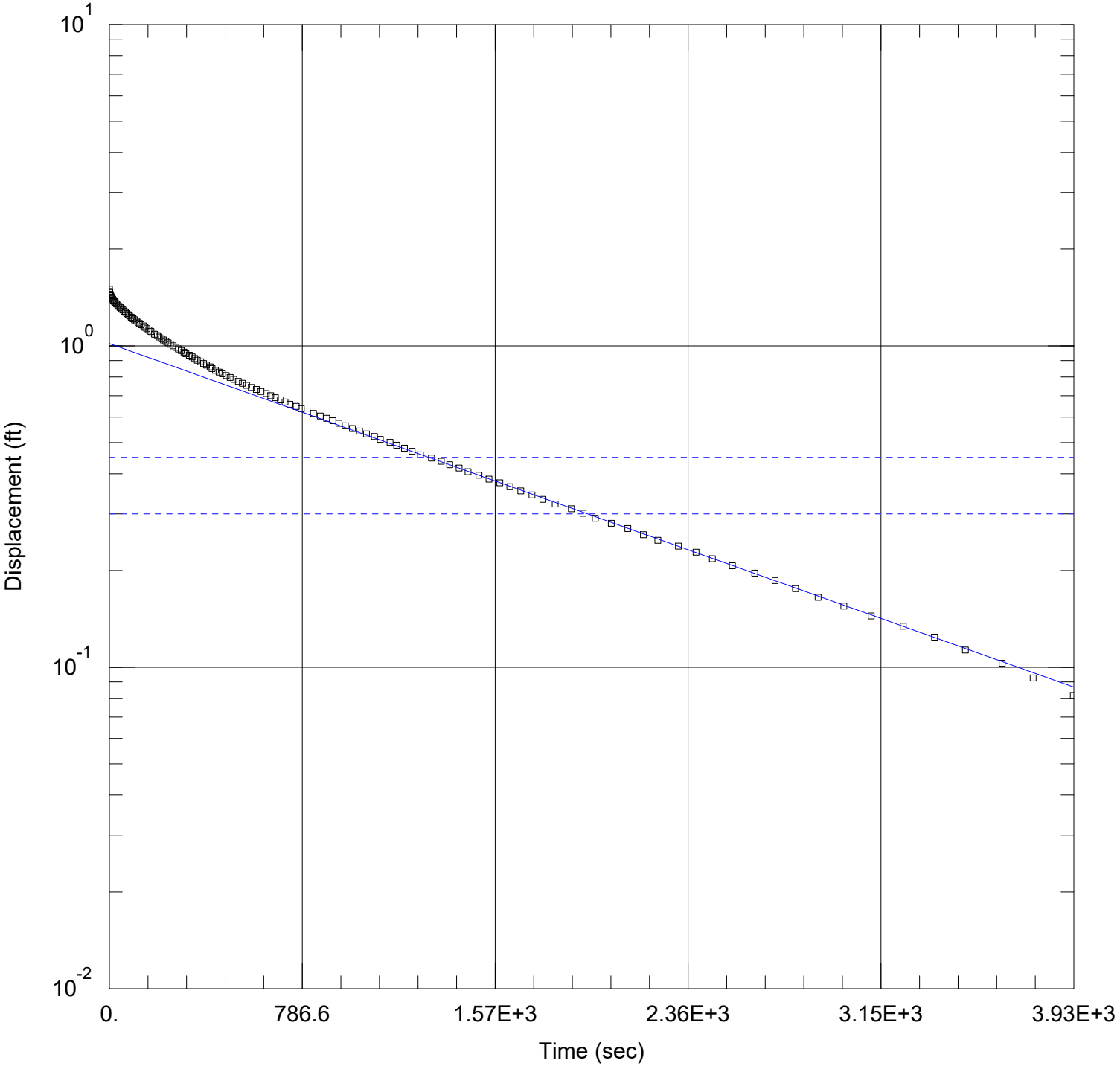
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 2.434E-5 cm/sec

y0 = 1.998 ft



MW-16 RISING HEAD TEST

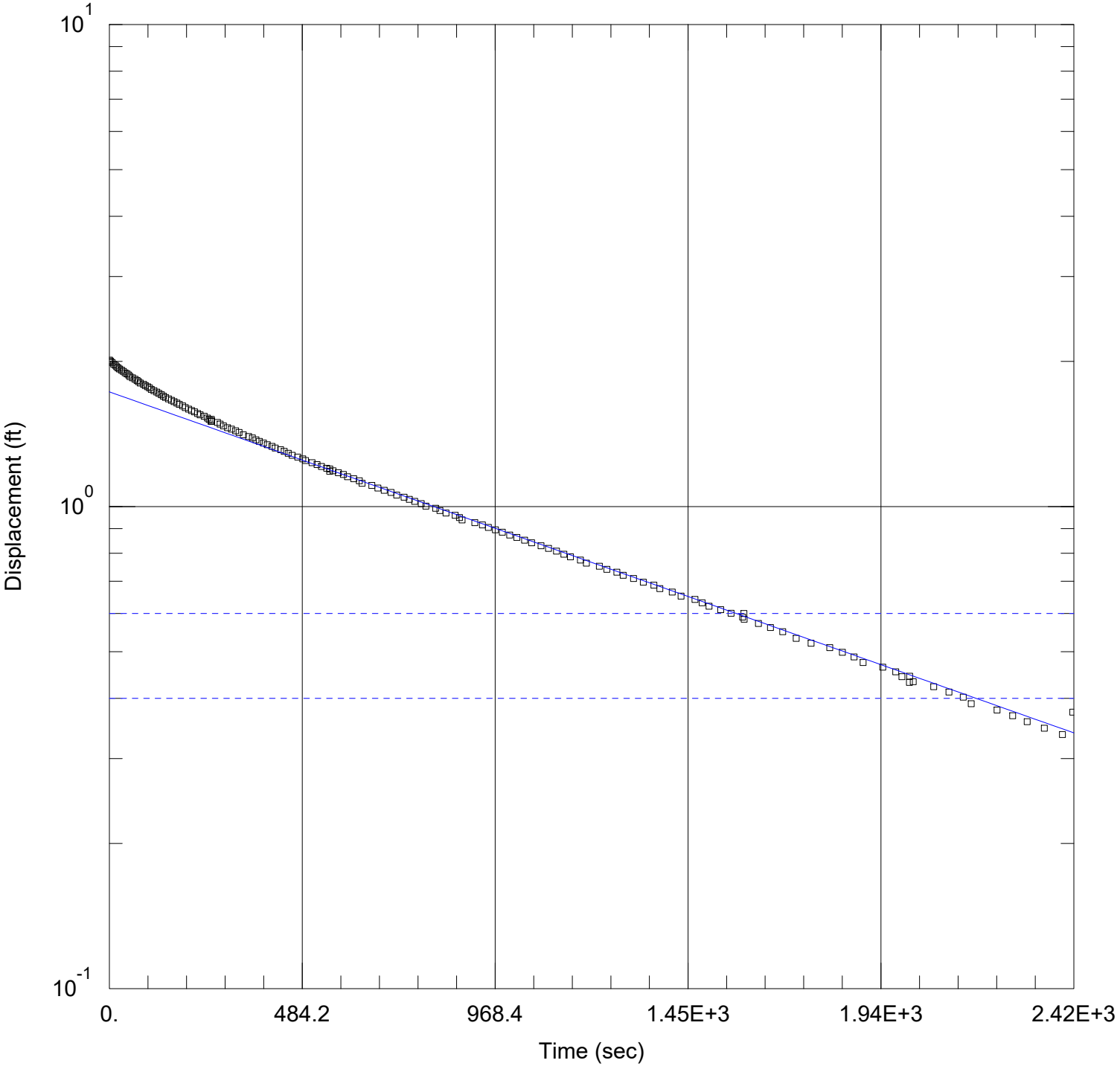
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0003707 cm/sec

y0 = 1.017 ft



MW-16 FALLING HEAD TEST

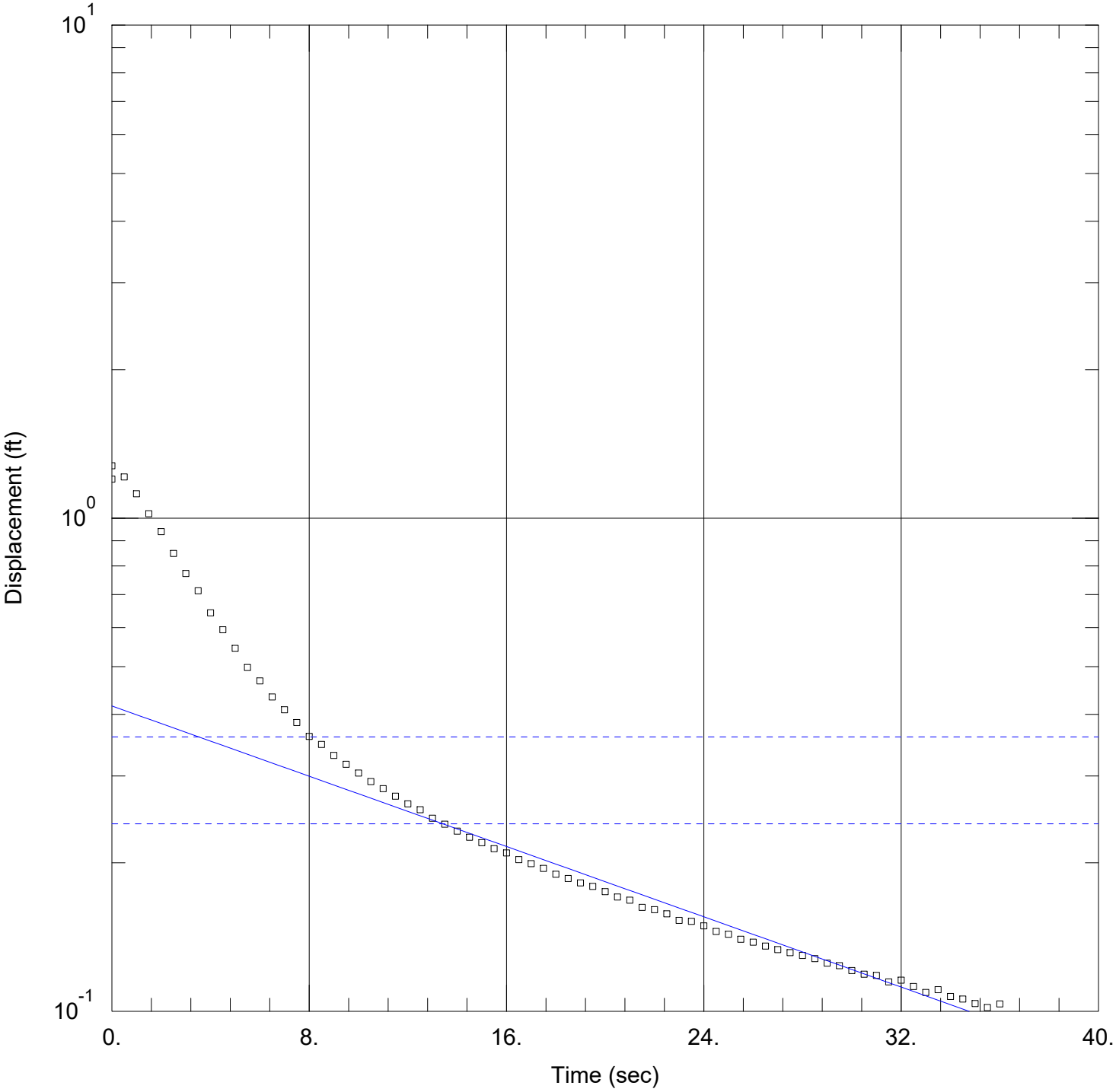
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0003986 cm/sec

y0 = 1.729 ft



MW-14WT RISING HEAD TEST

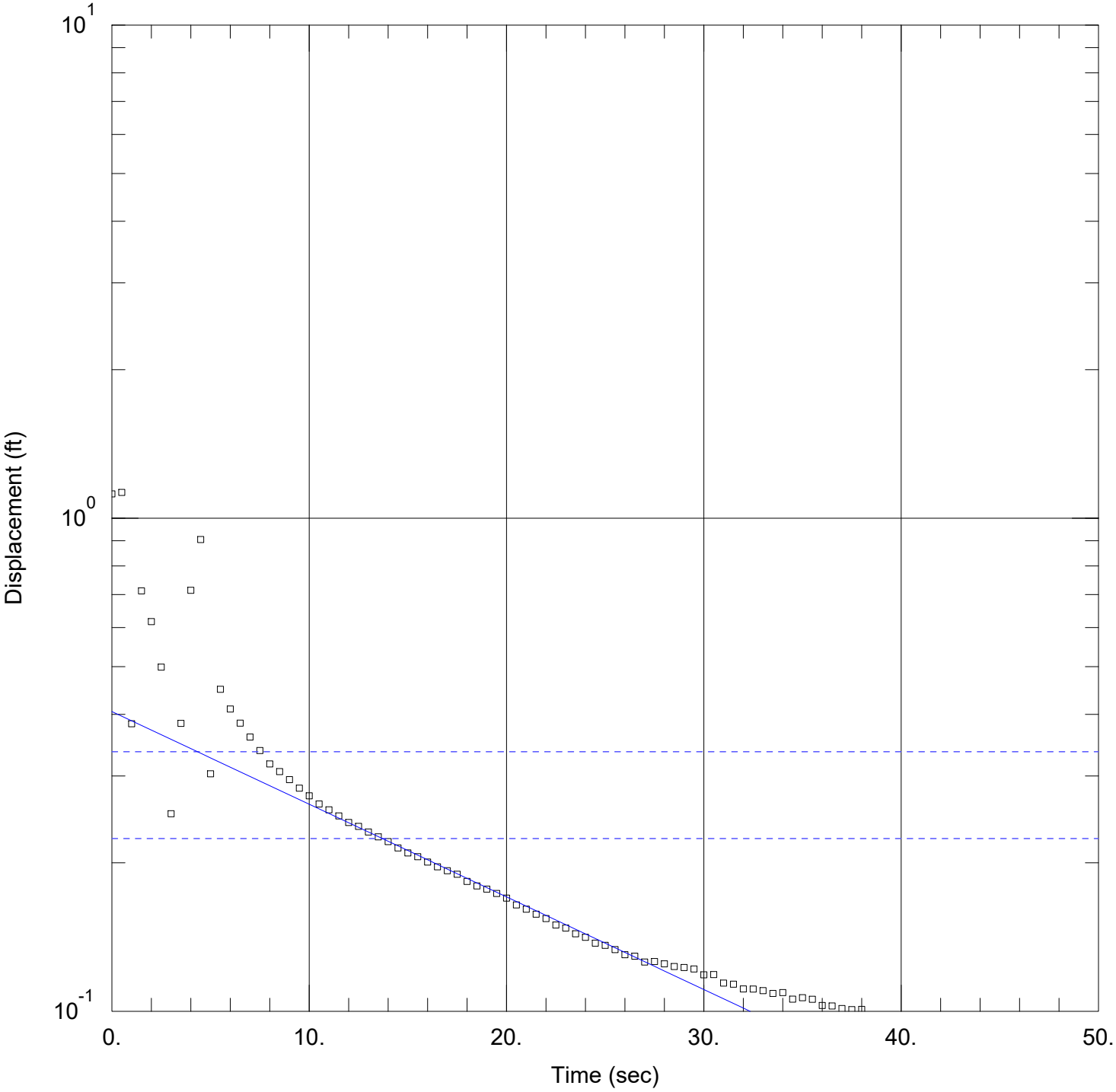
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.00994 cm/sec

y0 = 0.416 ft



MW-14WT FALLING HEAD TEST

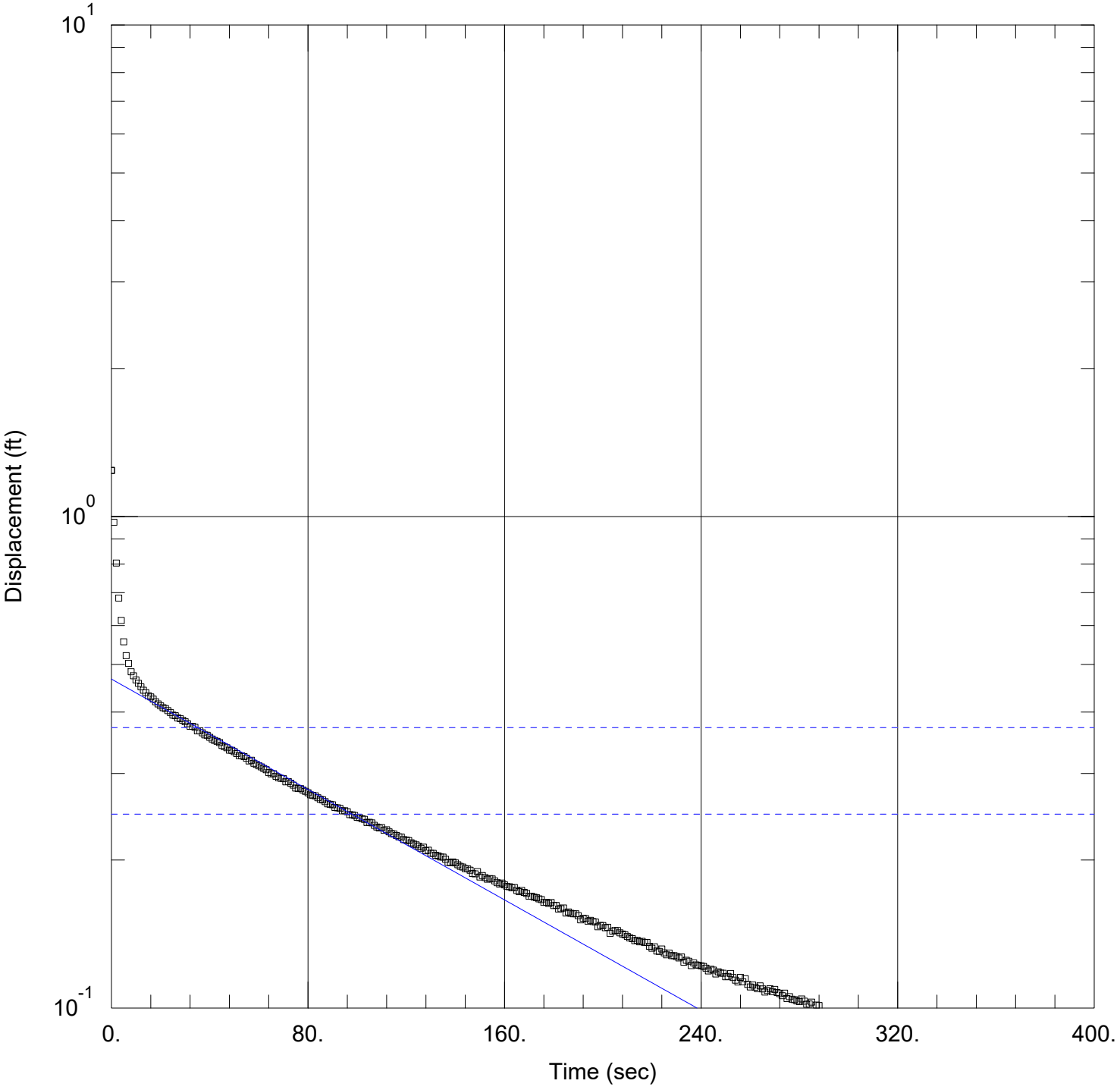
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.007884 cm/sec

y0 = 0.4053 ft



MW12 RISING HEAD TEST

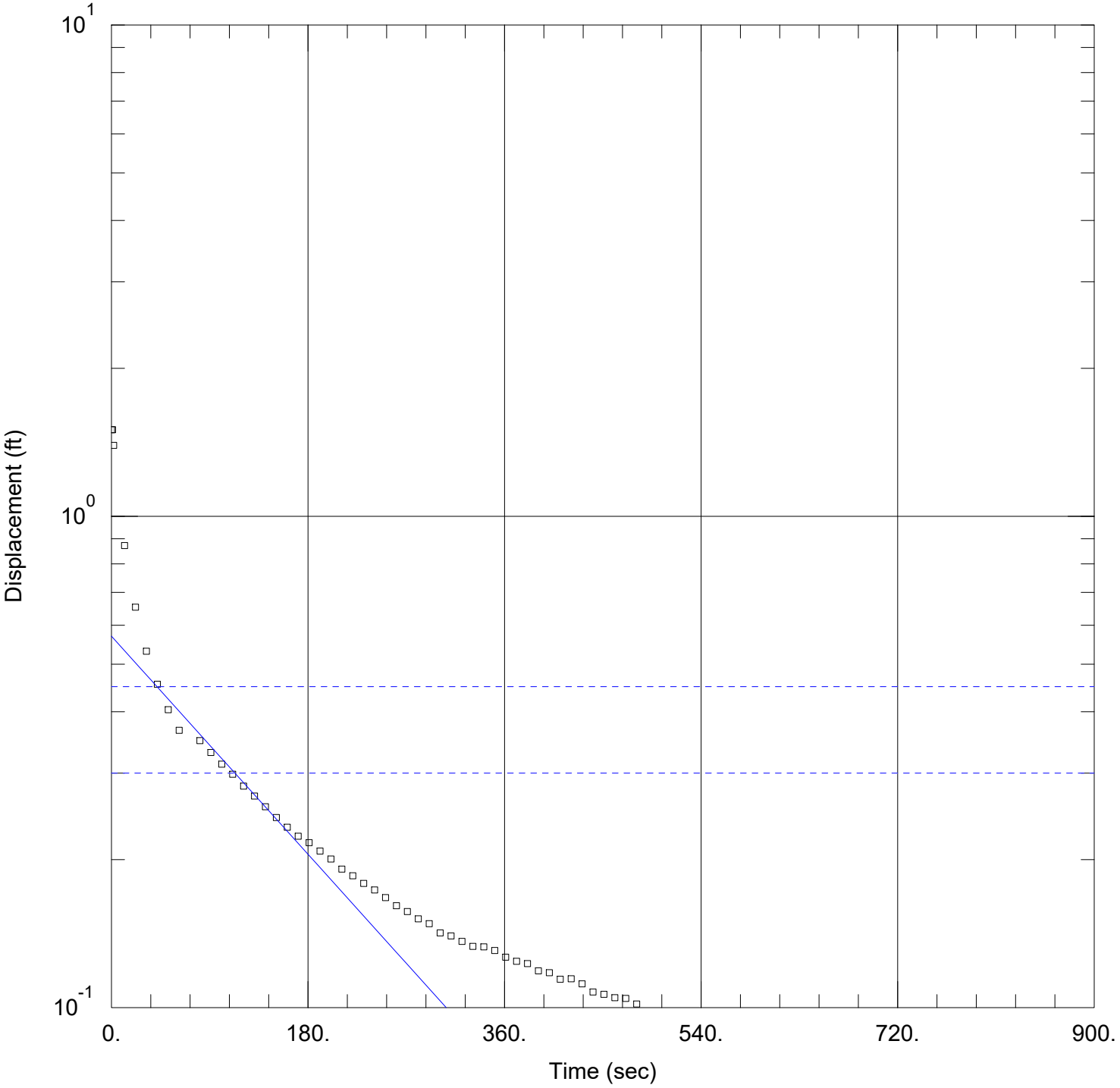
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001178 cm/sec

y0 = 0.4669 ft



MW-12 FALLING HEAD TEST

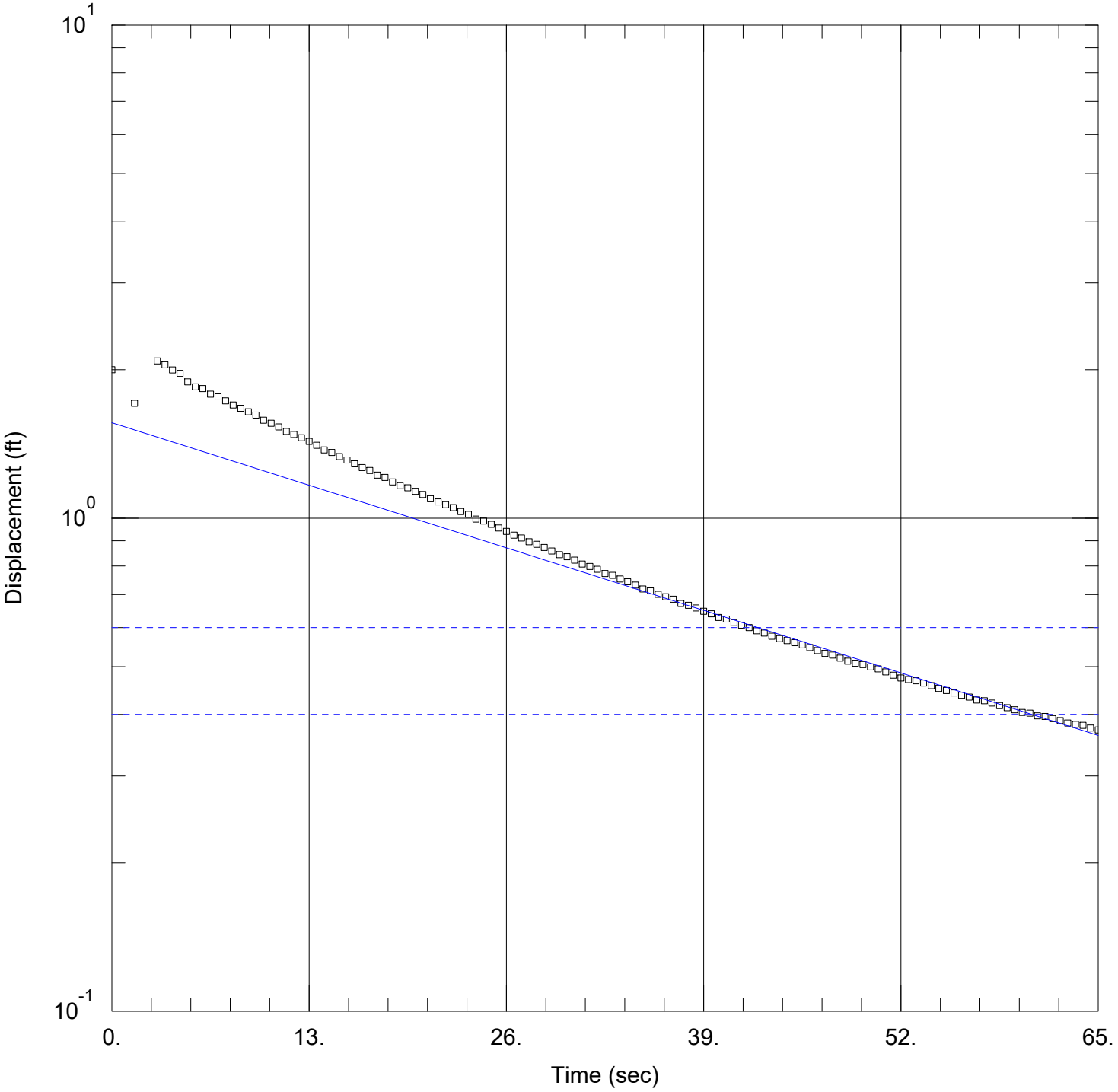
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001035 cm/sec

y0 = 0.5701 ft



MW-2P RISING HEAD TEST

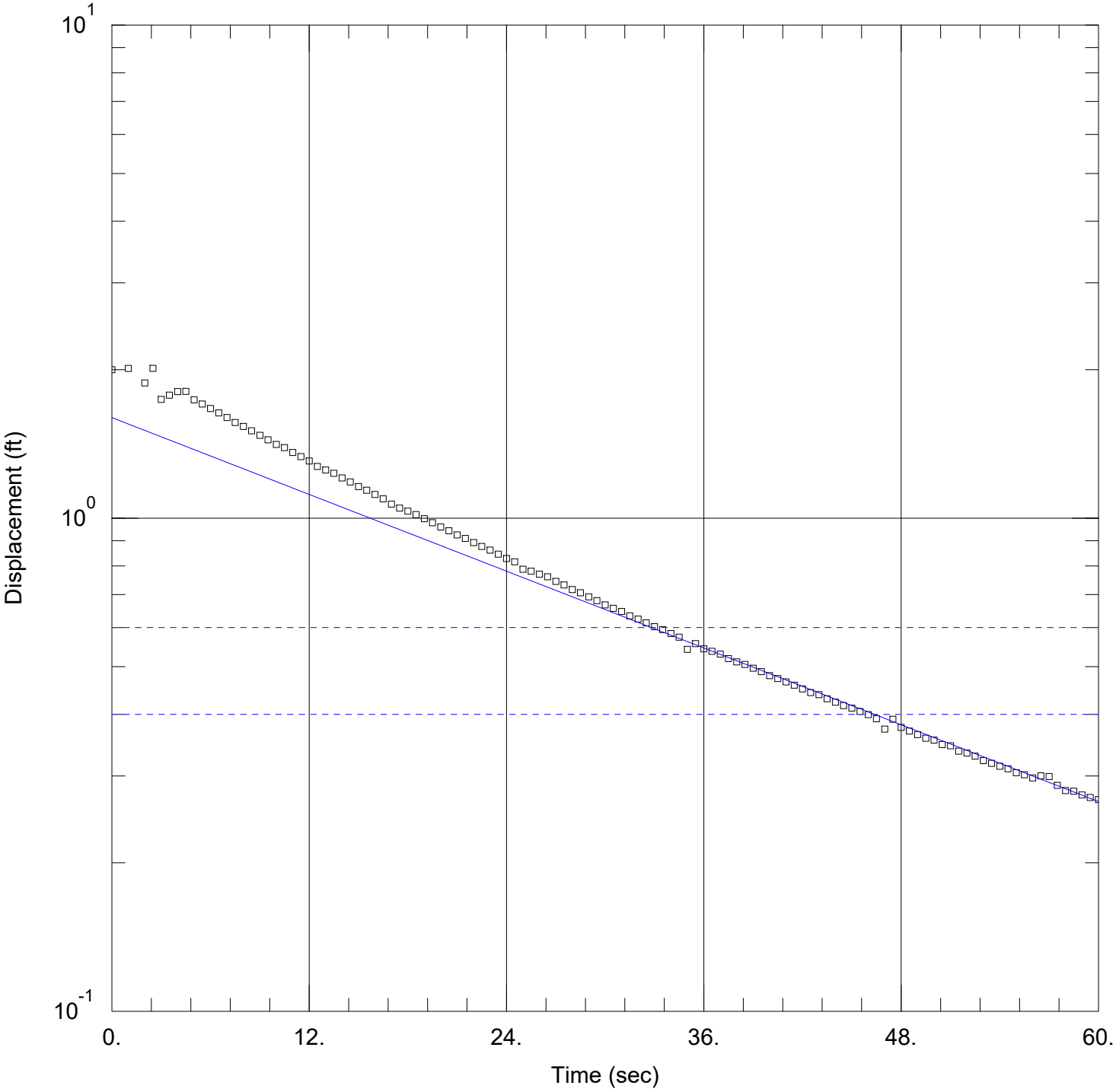
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001638 cm/sec

y0 = 1.562 ft



MW-2P FALLING HEAD TEST

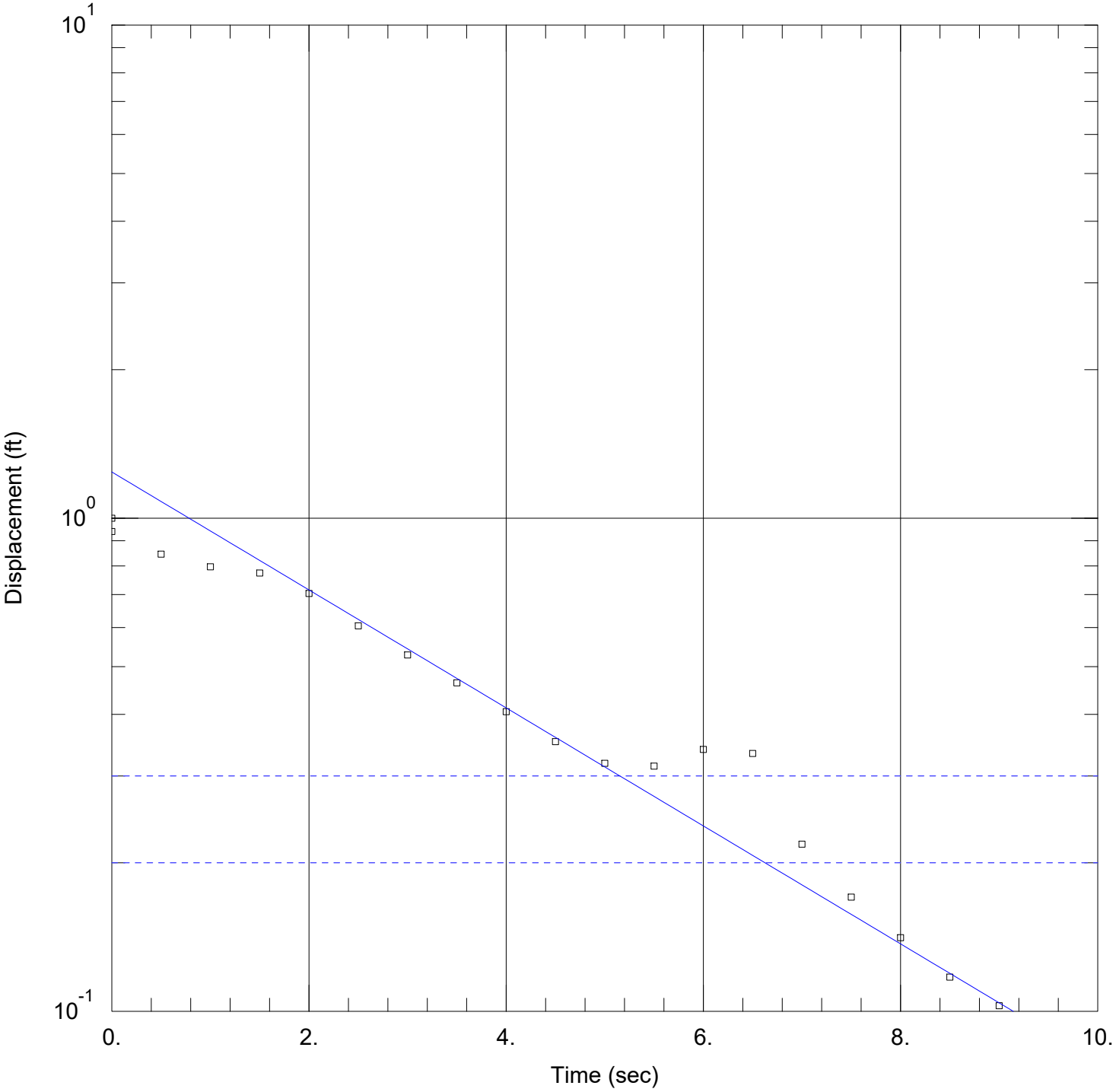
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001491 cm/sec

y0 = 1.599 ft



MW-1R RISING HEAD TEST

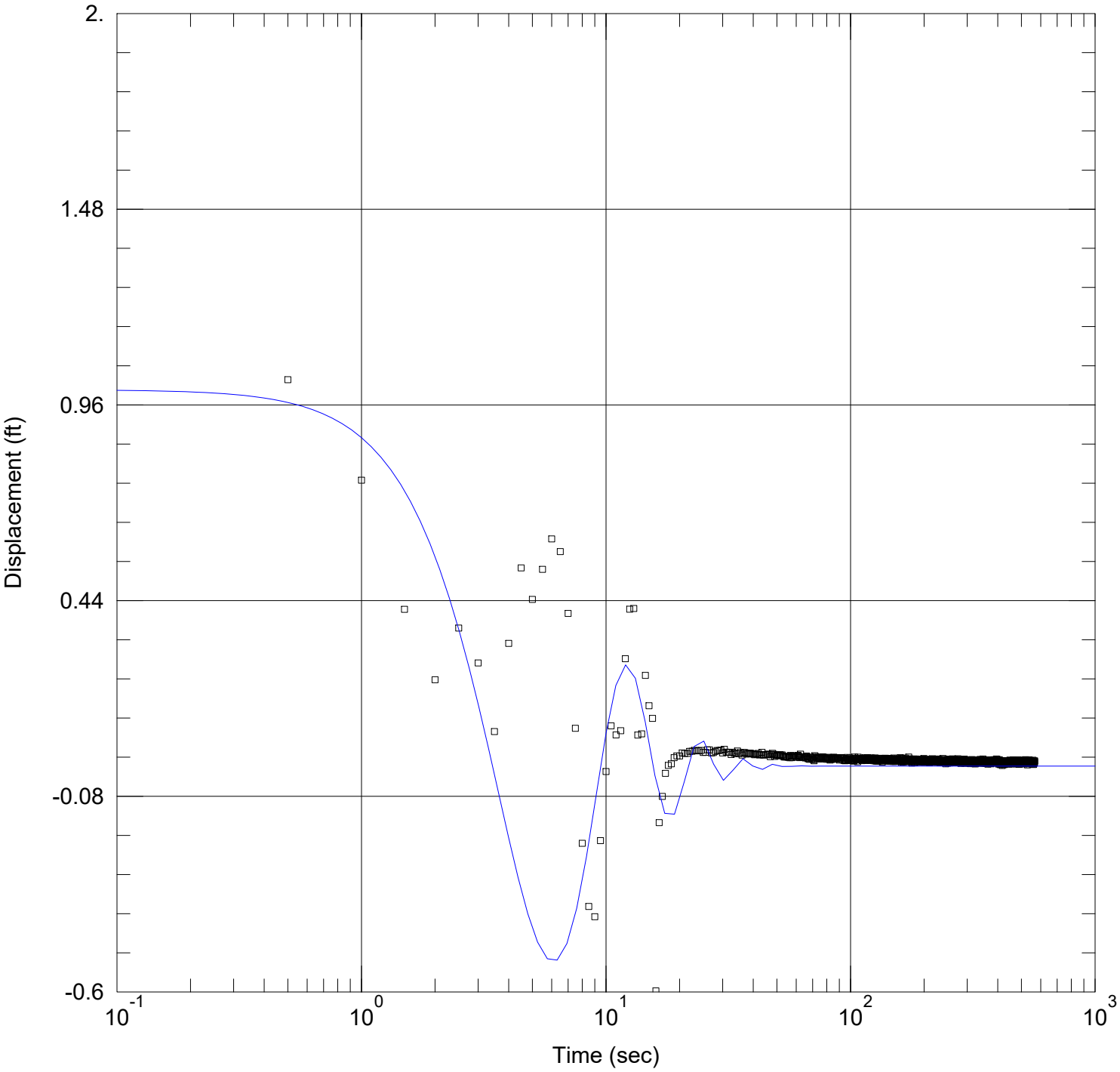
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.06674 cm/sec

y0 = 1.241 ft



MW-1R FALLING HEAD TES

SOLUTION

Aquifer Model: Unconfined

Solution Method: Springer-Gelhar

K = 0.09531 cm/sec

Le = 115.3 ft

Attachment I

Baseline Monitoring Laboratory Reports

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Stacie Sanborn
Vernon County Solid Waste & Recycling
S3705 County Road LF
Viroqua, Wisconsin 54665

Generated 1/12/2023 4:38:09 PM Revision 1

JOB DESCRIPTION

Vernon County Landfill Expansion

JOB NUMBER

500-227292-1

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

Results relate only to the items tested and the sample(s) as received by the laboratory. The results, detection limits (LOD) and Quantitation Limits (LOQ) have been adjusted for sample dilutions and/or solids content.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Authorization



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Authorized for release by
Sandie Fredrick, Project Manager II
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

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Job ID: 500-227292-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-227292-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 1/11/2023. The report (revision 1) is being revised due to: Client updated to reporting/invoicing direct to Vernon Co.

Receipt
The samples were received on 12/22/2022 10:25 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0º C.

GC/MS VOA
Method 8260B: Methylene chloride was detected in the following items: MW-14WT (500-227292-1), MW-16 (500-227292-2), MW-17WT (500-227292-3) and Trip Blank-VOC (500-227292-4). Methylene chloride is a known lab contaminant; therefore all low level detects for this compound could be suspected as lab contamination.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Field Service / Mobile Lab
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Client Sample ID: MW-14WT — Lab Sample ID: 500-227292-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methylene Chloride	2.1	J	5.0	1.6	ug/L	1		8260B	Total/NA
Arsenic	0.70	J	1.0	0.23	ug/L	1		6020A	Dissolved
Barium	54		2.5	0.73	ug/L	1		6020A	Dissolved
Copper	0.70	J	2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	460		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	240		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Sulfate	3.2		0.20	0.095	mg/L	1		300.0	Total/NA
Fluoride	0.20		0.20	0.067	mg/L	1		300.0	Total/NA
Chloride	5.0		0.40	0.34	mg/L	2		300.0	Dissolved
Nitrate Nitrite as N	0.21		0.10	0.041	mg/L	1		N07-0003	Dissolved
Alkalinity	230		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: MW-16 — Lab Sample ID: 500-227292-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methylene Chloride	2.0	J	5.0	1.6	ug/L	1		8260B	Total/NA
Arsenic	0.31	J	1.0	0.23	ug/L	1		6020A	Dissolved
Barium	70		2.5	0.73	ug/L	1		6020A	Dissolved
Copper	0.74	J	2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	6.1		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	380		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Sulfate	16		0.40	0.19	mg/L	2		300.0	Total/NA
Fluoride	0.20		0.20	0.067	mg/L	1		300.0	Total/NA
Chloride	7.2		0.40	0.34	mg/L	2		300.0	Dissolved
Nitrate Nitrite as N	0.90		0.10	0.041	mg/L	1		N07-0003	Dissolved
Alkalinity	390		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: MW-17WT — Lab Sample ID: 500-227292-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methylene Chloride	2.4	J	5.0	1.6	ug/L	1		8260B	Total/NA
Arsenic	0.52	J	1.0	0.23	ug/L	1		6020A	Dissolved
Barium	40		2.5	0.73	ug/L	1		6020A	Dissolved
Manganese	53		2.5	0.79	ug/L	1		6020A	Dissolved
Nickel	1.2	J	2.0	0.63	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	290		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Sulfate	7.2		0.20	0.095	mg/L	1		300.0	Total/NA
Fluoride	0.21		0.20	0.067	mg/L	1		300.0	Total/NA
Chloride	7.7		0.40	0.34	mg/L	2		300.0	Dissolved
Nitrate Nitrite as N	0.18		0.10	0.041	mg/L	1		N07-0003	Dissolved
Alkalinity	280		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: Trip Blank-VOC — Lab Sample ID: 500-227292-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methylene Chloride	2.4	J	5.0	1.6	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	EET CHI
6020A	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	EET CHI
300.0	Anions, Ion Chromatography	MCAWW	EET CHI
N07-0003	Enzymatic Nitrate-Nitrite Nitrogen	EPA	EET CHI
SM 2320B	Alkalinity	SM	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
5030B	Purge and Trap	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-227292-1	MW-14WT	Water	12/20/22 08:00	12/22/22 10:25
500-227292-2	MW-16	Water	12/20/22 10:00	12/22/22 10:25
500-227292-3	MW-17WT	Water	12/20/22 11:00	12/22/22 10:25
500-227292-4	Trip Blank-VOC	Water	12/20/22 00:00	12/22/22 10:25

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Client Sample ID: MW-14WT
Date Collected: 12/20/22 08:00
Date Received: 12/22/22 10:25

Lab Sample ID: 500-227292-1
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			12/30/22 13:40	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			12/30/22 13:40	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			12/30/22 13:40	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			12/30/22 13:40	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			12/30/22 13:40	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			12/30/22 13:40	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			12/30/22 13:40	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			12/30/22 13:40	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			12/30/22 13:40	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			12/30/22 13:40	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			12/30/22 13:40	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			12/30/22 13:40	1
1,2-Dibromoethane (EDB)	<0.39		1.0	0.39	ug/L			12/30/22 13:40	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			12/30/22 13:40	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			12/30/22 13:40	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			12/30/22 13:40	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			12/30/22 13:40	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			12/30/22 13:40	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			12/30/22 13:40	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			12/30/22 13:40	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			12/30/22 13:40	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			12/30/22 13:40	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			12/30/22 13:40	1
Benzene	<0.15		0.50	0.15	ug/L			12/30/22 13:40	1
Bromobenzene	<0.36		1.0	0.36	ug/L			12/30/22 13:40	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			12/30/22 13:40	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			12/30/22 13:40	1
Bromoform	<0.48		1.0	0.48	ug/L			12/30/22 13:40	1
Bromomethane	<0.80		3.0	0.80	ug/L			12/30/22 13:40	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			12/30/22 13:40	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			12/30/22 13:40	1
Chlorodibromomethane	<0.49		1.0	0.49	ug/L			12/30/22 13:40	1
Chloroethane	<0.51		1.0	0.51	ug/L			12/30/22 13:40	1
Chloroform	<0.37		2.0	0.37	ug/L			12/30/22 13:40	1
Chloromethane	<0.32		1.0	0.32	ug/L			12/30/22 13:40	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			12/30/22 13:40	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			12/30/22 13:40	1
Dibromomethane	<0.27		1.0	0.27	ug/L			12/30/22 13:40	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			12/30/22 13:40	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			12/30/22 13:40	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			12/30/22 13:40	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			12/30/22 13:40	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			12/30/22 13:40	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			12/30/22 13:40	1
Methylene Chloride	**2.1**	**J**	5.0	1.6	ug/L			12/30/22 13:40	1
Naphthalene	<0.34		1.0	0.34	ug/L			12/30/22 13:40	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			12/30/22 13:40	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			12/30/22 13:40	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			12/30/22 13:40	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Client Sample ID: MW-14WT

Date Collected: 12/20/22 08:00
Date Received: 12/22/22 10:25

Lab Sample ID: 500-227292-1

Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			12/30/22 13:40	1
Styrene	<0.39		1.0	0.39	ug/L			12/30/22 13:40	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			12/30/22 13:40	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			12/30/22 13:40	1
Toluene	<0.15		0.50	0.15	ug/L			12/30/22 13:40	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			12/30/22 13:40	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			12/30/22 13:40	1
Trichloroethene	<0.16		0.50	0.16	ug/L			12/30/22 13:40	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			12/30/22 13:40	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			12/30/22 13:40	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			12/30/22 13:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 126*		*12/30/22 13:40*	*1*
4-Bromofluorobenzene (Surr)	*105*		*72 - 124*		*12/30/22 13:40*	*1*
Dibromofluoromethane	*95*		*75 - 120*		*12/30/22 13:40*	*1*
Toluene-d8 (Surr)	*98*		*75 - 120*		*12/30/22 13:40*	*1*

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.70**	**J**	1.0	0.23	ug/L		01/03/23 09:28	01/04/23 20:51	1
Barium	**54**		2.5	0.73	ug/L		01/03/23 09:28	01/03/23 20:15	1
Cadmium	<0.17		0.50	0.17	ug/L		01/03/23 09:28	01/03/23 20:15	1
Chromium	<1.1		5.0	1.1	ug/L		01/03/23 09:28	01/03/23 20:15	1
Copper	**0.70**	**J**	2.0	0.50	ug/L		01/03/23 09:28	01/03/23 20:15	1
Lead	<0.19		0.50	0.19	ug/L		01/03/23 09:28	01/03/23 20:15	1
Manganese	**460**		2.5	0.79	ug/L		01/03/23 09:28	01/03/23 20:15	1
Selenium	<0.98		2.5	0.98	ug/L		01/03/23 09:28	01/03/23 20:15	1
Silver	<0.12		0.50	0.12	ug/L		01/03/23 09:28	01/03/23 20:15	1
Zinc	<6.9		20	6.9	ug/L		01/03/23 09:28	01/03/23 20:15	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.098		0.20	0.098	ug/L		01/03/23 15:15	01/04/23 08:40	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**240**		0.91	0.46	mg/L		01/03/23 09:28	01/05/23 15:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate (MCAWW 300.0)	**3.2**		0.20	0.095	mg/L			01/05/23 22:31	1
Fluoride (MCAWW 300.0)	**0.20**		0.20	0.067	mg/L			01/05/23 22:31	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (MCAWW 300.0)	**5.0**		0.40	0.34	mg/L			01/05/23 23:22	2
Nitrate Nitrite as N (EPA N07-0003)	**0.21**		0.10	0.041	mg/L			01/03/23 10:27	1
Alkalinity (SM 2320B)	**230**		5.0	3.7	mg/L			12/28/22 18:47	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Client Sample ID: MW-16
Date Collected: 12/20/22 10:00
Date Received: 12/22/22 10:25

Lab Sample ID: 500-227292-2
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			12/30/22 14:04	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			12/30/22 14:04	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			12/30/22 14:04	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			12/30/22 14:04	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			12/30/22 14:04	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			12/30/22 14:04	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			12/30/22 14:04	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			12/30/22 14:04	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			12/30/22 14:04	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			12/30/22 14:04	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			12/30/22 14:04	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			12/30/22 14:04	1
1,2-Dibromoethane (EDB)	<0.39		1.0	0.39	ug/L			12/30/22 14:04	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			12/30/22 14:04	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			12/30/22 14:04	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			12/30/22 14:04	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			12/30/22 14:04	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			12/30/22 14:04	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			12/30/22 14:04	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			12/30/22 14:04	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			12/30/22 14:04	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			12/30/22 14:04	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			12/30/22 14:04	1
Benzene	<0.15		0.50	0.15	ug/L			12/30/22 14:04	1
Bromobenzene	<0.36		1.0	0.36	ug/L			12/30/22 14:04	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			12/30/22 14:04	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			12/30/22 14:04	1
Bromoform	<0.48		1.0	0.48	ug/L			12/30/22 14:04	1
Bromomethane	<0.80		3.0	0.80	ug/L			12/30/22 14:04	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			12/30/22 14:04	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			12/30/22 14:04	1
Chlorodibromomethane	<0.49		1.0	0.49	ug/L			12/30/22 14:04	1
Chloroethane	<0.51		1.0	0.51	ug/L			12/30/22 14:04	1
Chloroform	<0.37		2.0	0.37	ug/L			12/30/22 14:04	1
Chloromethane	<0.32		1.0	0.32	ug/L			12/30/22 14:04	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			12/30/22 14:04	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			12/30/22 14:04	1
Dibromomethane	<0.27		1.0	0.27	ug/L			12/30/22 14:04	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			12/30/22 14:04	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			12/30/22 14:04	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			12/30/22 14:04	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			12/30/22 14:04	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			12/30/22 14:04	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			12/30/22 14:04	1
Methylene Chloride	**2.0**	**J**	5.0	1.6	ug/L			12/30/22 14:04	1
Naphthalene	<0.34		1.0	0.34	ug/L			12/30/22 14:04	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			12/30/22 14:04	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			12/30/22 14:04	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			12/30/22 14:04	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Client Sample ID: MW-16

Date Collected: 12/20/22 10:00
Date Received: 12/22/22 10:25

Lab Sample ID: 500-227292-2

Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			12/30/22 14:04	1
Styrene	<0.39		1.0	0.39	ug/L			12/30/22 14:04	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			12/30/22 14:04	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			12/30/22 14:04	1
Toluene	<0.15		0.50	0.15	ug/L			12/30/22 14:04	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			12/30/22 14:04	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			12/30/22 14:04	1
Trichloroethene	<0.16		0.50	0.16	ug/L			12/30/22 14:04	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			12/30/22 14:04	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			12/30/22 14:04	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			12/30/22 14:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 126*		*12/30/22 14:04*	*1*
4-Bromofluorobenzene (Surr)	*109*		*72 - 124*		*12/30/22 14:04*	*1*
Dibromofluoromethane	*96*		*75 - 120*		*12/30/22 14:04*	*1*
Toluene-d8 (Surr)	*98*		*75 - 120*		*12/30/22 14:04*	*1*

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.31**	**J**	1.0	0.23	ug/L		01/03/23 09:28	01/04/23 20:55	1
Barium	**70**		2.5	0.73	ug/L		01/03/23 09:28	01/03/23 20:18	1
Cadmium	<0.17		0.50	0.17	ug/L		01/03/23 09:28	01/03/23 20:18	1
Chromium	<1.1		5.0	1.1	ug/L		01/03/23 09:28	01/03/23 20:18	1
Copper	**0.74**	**J**	2.0	0.50	ug/L		01/03/23 09:28	01/03/23 20:18	1
Lead	<0.19		0.50	0.19	ug/L		01/03/23 09:28	01/03/23 20:18	1
Manganese	**6.1**		2.5	0.79	ug/L		01/03/23 09:28	01/03/23 20:18	1
Selenium	<0.98		2.5	0.98	ug/L		01/03/23 09:28	01/03/23 20:18	1
Silver	<0.12		0.50	0.12	ug/L		01/03/23 09:28	01/03/23 20:18	1
Zinc	<6.9		20	6.9	ug/L		01/03/23 09:28	01/03/23 20:18	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.098		0.20	0.098	ug/L		01/03/23 15:15	01/04/23 08:42	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**380**		0.91	0.46	mg/L		01/03/23 09:28	01/05/23 15:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate (MCAWW 300.0)	**16**		0.40	0.19	mg/L			01/05/23 22:57	2
Fluoride (MCAWW 300.0)	**0.20**		0.20	0.067	mg/L			01/05/23 22:44	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (MCAWW 300.0)	**7.2**		0.40	0.34	mg/L			01/06/23 00:00	2
Nitrate Nitrite as N (EPA N07-0003)	**0.90**		0.10	0.041	mg/L			01/03/23 10:28	1
Alkalinity (SM 2320B)	**390**		5.0	3.7	mg/L			12/28/22 18:56	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Client Sample ID: MW-17WT
Date Collected: 12/20/22 11:00
Date Received: 12/22/22 10:25

Lab Sample ID: 500-227292-3
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			12/30/22 14:29	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			12/30/22 14:29	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			12/30/22 14:29	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			12/30/22 14:29	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			12/30/22 14:29	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			12/30/22 14:29	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			12/30/22 14:29	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			12/30/22 14:29	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			12/30/22 14:29	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			12/30/22 14:29	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			12/30/22 14:29	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			12/30/22 14:29	1
1,2-Dibromoethane (EDB)	<0.39		1.0	0.39	ug/L			12/30/22 14:29	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			12/30/22 14:29	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			12/30/22 14:29	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			12/30/22 14:29	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			12/30/22 14:29	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			12/30/22 14:29	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			12/30/22 14:29	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			12/30/22 14:29	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			12/30/22 14:29	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			12/30/22 14:29	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			12/30/22 14:29	1
Benzene	<0.15		0.50	0.15	ug/L			12/30/22 14:29	1
Bromobenzene	<0.36		1.0	0.36	ug/L			12/30/22 14:29	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			12/30/22 14:29	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			12/30/22 14:29	1
Bromoform	<0.48		1.0	0.48	ug/L			12/30/22 14:29	1
Bromomethane	<0.80		3.0	0.80	ug/L			12/30/22 14:29	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			12/30/22 14:29	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			12/30/22 14:29	1
Chlorodibromomethane	<0.49		1.0	0.49	ug/L			12/30/22 14:29	1
Chloroethane	<0.51		1.0	0.51	ug/L			12/30/22 14:29	1
Chloroform	<0.37		2.0	0.37	ug/L			12/30/22 14:29	1
Chloromethane	<0.32		1.0	0.32	ug/L			12/30/22 14:29	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			12/30/22 14:29	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			12/30/22 14:29	1
Dibromomethane	<0.27		1.0	0.27	ug/L			12/30/22 14:29	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			12/30/22 14:29	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			12/30/22 14:29	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			12/30/22 14:29	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			12/30/22 14:29	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			12/30/22 14:29	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			12/30/22 14:29	1
Methylene Chloride	**2.4**	**J**	5.0	1.6	ug/L			12/30/22 14:29	1
Naphthalene	<0.34		1.0	0.34	ug/L			12/30/22 14:29	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			12/30/22 14:29	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			12/30/22 14:29	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			12/30/22 14:29	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Client Sample ID: MW-17WT

Date Collected: 12/20/22 11:00
Date Received: 12/22/22 10:25

Lab Sample ID: 500-227292-3

Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			12/30/22 14:29	1
Styrene	<0.39		1.0	0.39	ug/L			12/30/22 14:29	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			12/30/22 14:29	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			12/30/22 14:29	1
Toluene	<0.15		0.50	0.15	ug/L			12/30/22 14:29	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			12/30/22 14:29	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			12/30/22 14:29	1
Trichloroethene	<0.16		0.50	0.16	ug/L			12/30/22 14:29	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			12/30/22 14:29	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			12/30/22 14:29	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			12/30/22 14:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 126*		*12/30/22 14:29*	*1*
4-Bromofluorobenzene (Surr)	*108*		*72 - 124*		*12/30/22 14:29*	*1*
Dibromofluoromethane	*99*		*75 - 120*		*12/30/22 14:29*	*1*
Toluene-d8 (Surr)	*99*		*75 - 120*		*12/30/22 14:29*	*1*

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		01/03/23 09:28	01/03/23 20:22	1
Arsenic	**0.52**	**J**	1.0	0.23	ug/L		01/03/23 09:28	01/04/23 20:58	1
Barium	**40**		2.5	0.73	ug/L		01/03/23 09:28	01/03/23 20:22	1
Beryllium	<0.53		1.0	0.53	ug/L		01/03/23 09:28	01/03/23 20:22	1
Cadmium	<0.17		0.50	0.17	ug/L		01/03/23 09:28	01/03/23 20:22	1
Chromium	<1.1		5.0	1.1	ug/L		01/03/23 09:28	01/03/23 20:22	1
Cobalt	<0.40		1.0	0.40	ug/L		01/03/23 09:28	01/03/23 20:22	1
Copper	<0.50		2.0	0.50	ug/L		01/03/23 09:28	01/03/23 20:22	1
Lead	<0.19		0.50	0.19	ug/L		01/03/23 09:28	01/03/23 20:22	1
Manganese	**53**		2.5	0.79	ug/L		01/03/23 09:28	01/03/23 20:22	1
Nickel	**1.2**	**J**	2.0	0.63	ug/L		01/03/23 09:28	01/03/23 20:22	1
Selenium	<0.98		2.5	0.98	ug/L		01/03/23 09:28	01/03/23 20:22	1
Silver	<0.12		0.50	0.12	ug/L		01/03/23 09:28	01/03/23 20:22	1
Titanium	<1.8		5.0	1.8	ug/L		01/03/23 09:28	01/03/23 20:22	1
Vanadium	<2.2		5.0	2.2	ug/L		01/03/23 09:28	01/04/23 20:58	1
Zinc	<6.9		20	6.9	ug/L		01/03/23 09:28	01/03/23 20:22	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.098		0.20	0.098	ug/L		01/03/23 15:15	01/04/23 08:44	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**290**		0.91	0.46	mg/L		01/03/23 09:28	01/05/23 15:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate (MCAWW 300.0)	**7.2**		0.20	0.095	mg/L			01/05/23 23:09	1
Fluoride (MCAWW 300.0)	**0.21**		0.20	0.067	mg/L			01/05/23 23:09	1

Client Sample Results

Client: Vernon County Solid Waste & Recycling
Job ID: 500-227292-1
Project/Site: Vernon County Landfill Expansion

Client Sample ID: MW-17WT
Lab Sample ID: 500-227292-3
Date Collected: 12/20/22 11:00
Matrix: Water
Date Received: 12/22/22 10:25

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (MCAWW 300.0)	7.7		0.40	0.34	mg/L			01/06/23 00:13	2
Nitrate Nitrite as N (EPA N07-0003)	0.18		0.10	0.041	mg/L			01/03/23 10:28	1
Alkalinity (SM 2320B)	280		5.0	3.7	mg/L			12/28/22 19:03	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Client Sample ID: Trip Blank-VOC
Date Collected: 12/20/22 00:00
Date Received: 12/22/22 10:25

Lab Sample ID: 500-227292-4
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			12/30/22 14:52	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			12/30/22 14:52	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			12/30/22 14:52	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			12/30/22 14:52	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			12/30/22 14:52	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			12/30/22 14:52	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			12/30/22 14:52	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			12/30/22 14:52	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			12/30/22 14:52	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			12/30/22 14:52	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			12/30/22 14:52	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			12/30/22 14:52	1
1,2-Dibromoethane (EDB)	<0.39		1.0	0.39	ug/L			12/30/22 14:52	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			12/30/22 14:52	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			12/30/22 14:52	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			12/30/22 14:52	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			12/30/22 14:52	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			12/30/22 14:52	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			12/30/22 14:52	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			12/30/22 14:52	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			12/30/22 14:52	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			12/30/22 14:52	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			12/30/22 14:52	1
Benzene	<0.15		0.50	0.15	ug/L			12/30/22 14:52	1
Bromobenzene	<0.36		1.0	0.36	ug/L			12/30/22 14:52	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			12/30/22 14:52	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			12/30/22 14:52	1
Bromoform	<0.48		1.0	0.48	ug/L			12/30/22 14:52	1
Bromomethane	<0.80		3.0	0.80	ug/L			12/30/22 14:52	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			12/30/22 14:52	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			12/30/22 14:52	1
Chlorodibromomethane	<0.49		1.0	0.49	ug/L			12/30/22 14:52	1
Chloroethane	<0.51		1.0	0.51	ug/L			12/30/22 14:52	1
Chloroform	<0.37		2.0	0.37	ug/L			12/30/22 14:52	1
Chloromethane	<0.32		1.0	0.32	ug/L			12/30/22 14:52	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			12/30/22 14:52	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			12/30/22 14:52	1
Dibromomethane	<0.27		1.0	0.27	ug/L			12/30/22 14:52	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			12/30/22 14:52	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			12/30/22 14:52	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			12/30/22 14:52	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			12/30/22 14:52	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			12/30/22 14:52	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			12/30/22 14:52	1
Methylene Chloride	**2.4**	**J**	5.0	1.6	ug/L			12/30/22 14:52	1
Naphthalene	<0.34		1.0	0.34	ug/L			12/30/22 14:52	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			12/30/22 14:52	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			12/30/22 14:52	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			12/30/22 14:52	1

Client: Vernon County Solid Waste & Recycling
Job ID: 500-227292-1
Project/Site: Vernon County Landfill Expansion

Client Sample ID: Trip Blank-VOC
Lab Sample ID: 500-227292-4
Date Collected: 12/20/22 00:00
Matrix: Water
Date Received: 12/22/22 10:25

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			12/30/22 14:52	1
Styrene	<0.39		1.0	0.39	ug/L			12/30/22 14:52	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			12/30/22 14:52	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			12/30/22 14:52	1
Toluene	<0.15		0.50	0.15	ug/L			12/30/22 14:52	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			12/30/22 14:52	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			12/30/22 14:52	1
Trichloroethene	<0.16		0.50	0.16	ug/L			12/30/22 14:52	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			12/30/22 14:52	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			12/30/22 14:52	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			12/30/22 14:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 126*		*12/30/22 14:52*	*1*
4-Bromofluorobenzene (Surr)	*109*		*72 - 124*		*12/30/22 14:52*	*1*
Dibromofluoromethane	*96*		*75 - 120*		*12/30/22 14:52*	*1*
Toluene-d8 (Surr)	*100*		*75 - 120*		*12/30/22 14:52*	*1*

Definitions/Glossary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-227292-1
Project/Site: Vernon County Landfill Expansion

GC/MS VOA

Analysis Batch: 691907

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-227292-1	MW-14WT	Total/NA	Water	8260B	
500-227292-2	MW-16	Total/NA	Water	8260B	
500-227292-3	MW-17WT	Total/NA	Water	8260B	
500-227292-4	Trip Blank-VOC	Total/NA	Water	8260B	
MB 500-691907/7	Method Blank	Total/NA	Water	8260B	
LCS 500-691907/5	Lab Control Sample	Total/NA	Water	8260B	

Metals

Prep Batch: 692211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-227292-1	MW-14WT	Dissolved	Water	3005A	
500-227292-2	MW-16	Dissolved	Water	3005A	
500-227292-3	MW-17WT	Dissolved	Water	3005A	
MB 500-692211/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-692211/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 692296

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-227292-1	MW-14WT	Dissolved	Water	7470A	
500-227292-2	MW-16	Dissolved	Water	7470A	
500-227292-3	MW-17WT	Dissolved	Water	7470A	
MB 500-692296/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-692296/13-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 692431

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-227292-1	MW-14WT	Dissolved	Water	6020A	692211
500-227292-2	MW-16	Dissolved	Water	6020A	692211
500-227292-3	MW-17WT	Dissolved	Water	6020A	692211
MB 500-692211/1-A	Method Blank	Total Recoverable	Water	6020A	692211
LCS 500-692211/2-A	Lab Control Sample	Total Recoverable	Water	6020A	692211

Analysis Batch: 692442

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-227292-1	MW-14WT	Dissolved	Water	7470A	692296
500-227292-2	MW-16	Dissolved	Water	7470A	692296
500-227292-3	MW-17WT	Dissolved	Water	7470A	692296
MB 500-692296/12-A	Method Blank	Total/NA	Water	7470A	692296
LCS 500-692296/13-A	Lab Control Sample	Total/NA	Water	7470A	692296

Analysis Batch: 692599

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-227292-1	MW-14WT	Dissolved	Water	6020A	692211
500-227292-2	MW-16	Dissolved	Water	6020A	692211
500-227292-3	MW-17WT	Dissolved	Water	6020A	692211
MB 500-692211/1-A	Method Blank	Total Recoverable	Water	6020A	692211
LCS 500-692211/2-A	Lab Control Sample	Total Recoverable	Water	6020A	692211

QC Association Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-227292-1
Project/Site: Vernon County Landfill Expansion

Metals

Analysis Batch: 692688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-227292-1	MW-14WT	Dissolved	Water	SM 2340B	692211
500-227292-2	MW-16	Dissolved	Water	SM 2340B	692211
500-227292-3	MW-17WT	Dissolved	Water	SM 2340B	692211

General Chemistry

Analysis Batch: 691704

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-227292-1	MW-14WT	Dissolved	Water	SM 2320B	
500-227292-2	MW-16	Dissolved	Water	SM 2320B	
500-227292-3	MW-17WT	Dissolved	Water	SM 2320B	
MB 500-691704/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-691704/4	Lab Control Sample	Total/NA	Water	SM 2320B	
500-227292-3 DU	MW-17WT	Dissolved	Water	SM 2320B	

Analysis Batch: 692250

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-227292-1	MW-14WT	Dissolved	Water	N07-0003	
500-227292-2	MW-16	Dissolved	Water	N07-0003	
500-227292-3	MW-17WT	Dissolved	Water	N07-0003	
MB 500-692250/45	Method Blank	Total/NA	Water	N07-0003	
LCS 500-692250/46	Lab Control Sample	Total/NA	Water	N07-0003	

Analysis Batch: 692916

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-227292-1	MW-14WT	Dissolved	Water	300.0	
500-227292-1	MW-14WT	Total/NA	Water	300.0	
500-227292-2	MW-16	Dissolved	Water	300.0	
500-227292-2	MW-16	Total/NA	Water	300.0	
500-227292-2	MW-16	Total/NA	Water	300.0	
500-227292-3	MW-17WT	Dissolved	Water	300.0	
500-227292-3	MW-17WT	Total/NA	Water	300.0	
MB 500-692916/30	Method Blank	Total/NA	Water	300.0	
LCS 500-692916/31	Lab Control Sample	Total/NA	Water	300.0	

Surrogate Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(75-126)	(72-124)	(75-120)	(75-120)
500-227292-1	MW-14WT	91	105	95	98
500-227292-2	MW-16	94	109	96	98
500-227292-3	MW-17WT	95	108	99	99
500-227292-4	Trip Blank-VOC	93	109	96	100
LCS 500-691907/5	Lab Control Sample	94	110	97	99
MB 500-691907/7	Method Blank	96	109	99	97

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane
TOL = Toluene-d8 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-691907/7
Matrix: Water
Analysis Batch: 691907

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			12/30/22 11:39	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			12/30/22 11:39	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			12/30/22 11:39	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			12/30/22 11:39	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			12/30/22 11:39	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			12/30/22 11:39	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			12/30/22 11:39	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			12/30/22 11:39	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			12/30/22 11:39	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			12/30/22 11:39	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			12/30/22 11:39	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			12/30/22 11:39	1
1,2-Dibromoethane (EDB)	<0.39		1.0	0.39	ug/L			12/30/22 11:39	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			12/30/22 11:39	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			12/30/22 11:39	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			12/30/22 11:39	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			12/30/22 11:39	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			12/30/22 11:39	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			12/30/22 11:39	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			12/30/22 11:39	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			12/30/22 11:39	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			12/30/22 11:39	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			12/30/22 11:39	1
Benzene	<0.15		0.50	0.15	ug/L			12/30/22 11:39	1
Bromobenzene	<0.36		1.0	0.36	ug/L			12/30/22 11:39	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			12/30/22 11:39	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			12/30/22 11:39	1
Bromoform	<0.48		1.0	0.48	ug/L			12/30/22 11:39	1
Bromomethane	<0.80		3.0	0.80	ug/L			12/30/22 11:39	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			12/30/22 11:39	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			12/30/22 11:39	1
Chlorodibromomethane	<0.49		1.0	0.49	ug/L			12/30/22 11:39	1
Chloroethane	<0.51		1.0	0.51	ug/L			12/30/22 11:39	1
Chloroform	<0.37		2.0	0.37	ug/L			12/30/22 11:39	1
Chloromethane	<0.32		1.0	0.32	ug/L			12/30/22 11:39	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			12/30/22 11:39	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			12/30/22 11:39	1
Dibromomethane	<0.27		1.0	0.27	ug/L			12/30/22 11:39	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			12/30/22 11:39	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			12/30/22 11:39	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			12/30/22 11:39	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			12/30/22 11:39	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			12/30/22 11:39	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			12/30/22 11:39	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			12/30/22 11:39	1
Naphthalene	<0.34		1.0	0.34	ug/L			12/30/22 11:39	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			12/30/22 11:39	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			12/30/22 11:39	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 500-691907/7
Matrix: Water
Analysis Batch: 691907

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			12/30/22 11:39	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			12/30/22 11:39	1
Styrene	<0.39		1.0	0.39	ug/L			12/30/22 11:39	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			12/30/22 11:39	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			12/30/22 11:39	1
Toluene	<0.15		0.50	0.15	ug/L			12/30/22 11:39	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			12/30/22 11:39	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			12/30/22 11:39	1
Trichloroethene	<0.16		0.50	0.16	ug/L			12/30/22 11:39	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			12/30/22 11:39	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			12/30/22 11:39	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			12/30/22 11:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 126*		*12/30/22 11:39*	*1*
4-Bromofluorobenzene (Surr)	*109*		*72 - 124*		*12/30/22 11:39*	*1*
Dibromofluoromethane	*99*		*75 - 120*		*12/30/22 11:39*	*1*
Toluene-d8 (Surr)	*97*		*75 - 120*		*12/30/22 11:39*	*1*

Lab Sample ID: LCS 500-691907/5
Matrix: Water
Analysis Batch: 691907

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1,2-Tetrachloroethane	50.0	50.0		ug/L		100	70 - 125
1,1,1-Trichloroethane	50.0	47.7		ug/L		95	70 - 125
1,1,2,2-Tetrachloroethane	50.0	53.7		ug/L		107	62 - 140
1,1,2-Trichloroethane	50.0	49.9		ug/L		100	71 - 130
1,1-Dichloroethane	50.0	43.3		ug/L		87	70 - 125
1,1-Dichloroethene	50.0	37.8		ug/L		76	67 - 122
1,1-Dichloropropene	50.0	46.8		ug/L		94	70 - 121
1,2,3-Trichlorobenzene	50.0	31.9		ug/L		64	51 - 145
1,2,3-Trichloropropane	50.0	53.7		ug/L		107	50 - 133
1,2,4-Trichlorobenzene	50.0	35.7		ug/L		71	57 - 137
1,2,4-Trimethylbenzene	50.0	54.3		ug/L		109	70 - 123
1,2-Dibromo-3-Chloropropane	50.0	44.9		ug/L		90	56 - 123
1,2-Dibromoethane (EDB)	50.0	49.6		ug/L		99	70 - 125
1,2-Dichlorobenzene	50.0	47.8		ug/L		96	70 - 125
1,2-Dichloroethane	50.0	46.2		ug/L		92	68 - 127
1,2-Dichloropropane	50.0	45.0		ug/L		90	67 - 130
1,3,5-Trimethylbenzene	50.0	54.8		ug/L		110	70 - 123
1,3-Dichlorobenzene	50.0	49.6		ug/L		99	70 - 125
1,3-Dichloropropane	50.0	50.4		ug/L		101	62 - 136
1,4-Dichlorobenzene	50.0	49.4		ug/L		99	70 - 120
2,2-Dichloropropane	50.0	55.4		ug/L		111	58 - 139
2-Chlorotoluene	50.0	54.5		ug/L		109	70 - 125
4-Chlorotoluene	50.0	56.6		ug/L		113	68 - 124
Benzene	50.0	45.9		ug/L		92	70 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-691907/5
Matrix: Water
Analysis Batch: 691907

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromobenzene	50.0	52.8		ug/L		106	70 - 122
Bromochloromethane	50.0	47.0		ug/L		94	65 - 122
Bromodichloromethane	50.0	52.2		ug/L		104	69 - 120
Bromoform	50.0	59.2		ug/L		118	56 - 132
Bromomethane	50.0	74.4		ug/L		149	40 - 152
Carbon tetrachloride	50.0	50.6		ug/L		101	59 - 133
Chlorobenzene	50.0	50.0		ug/L		100	70 - 120
Chlorodibromomethane	50.0	55.8		ug/L		112	68 - 125
Chloroethane	50.0	49.4		ug/L		99	48 - 136
Chloroform	50.0	46.7		ug/L		93	70 - 120
Chloromethane	50.0	34.8		ug/L		70	56 - 152
cis-1,2-Dichloroethene	50.0	46.8		ug/L		94	70 - 125
cis-1,3-Dichloropropene	50.0	50.1		ug/L		100	64 - 127
Dibromomethane	50.0	49.3		ug/L		99	70 - 120
Dichlorodifluoromethane	50.0	38.0		ug/L		76	40 - 159
Ethylbenzene	50.0	51.5		ug/L		103	70 - 123
Hexachlorobutadiene	50.0	31.8		ug/L		64	51 - 150
Isopropylbenzene	50.0	54.3		ug/L		109	70 - 126
Methyl tert-butyl ether	50.0	44.7		ug/L		89	55 - 123
Methylene Chloride	50.0	47.0		ug/L		94	69 - 125
Naphthalene	50.0	35.8		ug/L		72	53 - 144
n-Butylbenzene	50.0	51.5		ug/L		103	68 - 125
N-Propylbenzene	50.0	56.3		ug/L		113	69 - 127
p-Isopropyltoluene	50.0	52.0		ug/L		104	70 - 125
sec-Butylbenzene	50.0	53.0		ug/L		106	70 - 123
Styrene	50.0	53.9		ug/L		108	70 - 120
tert-Butylbenzene	50.0	52.5		ug/L		105	70 - 121
Tetrachloroethene	50.0	46.5		ug/L		93	70 - 128
Toluene	50.0	50.8		ug/L		102	70 - 125
trans-1,2-Dichloroethene	50.0	44.1		ug/L		88	70 - 125
trans-1,3-Dichloropropene	50.0	52.3		ug/L		105	62 - 128
Trichloroethene	50.0	47.0		ug/L		94	70 - 125
Trichlorofluoromethane	50.0	47.6		ug/L		95	55 - 128
Vinyl chloride	50.0	46.1		ug/L		92	64 - 126
Xylenes, Total	100	105		ug/L		105	70 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 126*
4-Bromofluorobenzene (Surr)	*110*		*72 - 124*
Dibromofluoromethane	*97*		*75 - 120*
Toluene-d8 (Surr)	*99*		*75 - 120*

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-692211/1-A
Matrix: Water
Analysis Batch: 692431

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 692211

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		01/03/23 09:28	01/03/23 19:12	1
Barium	<0.73		2.5	0.73	ug/L		01/03/23 09:28	01/03/23 19:12	1
Beryllium	<0.53		1.0	0.53	ug/L		01/03/23 09:28	01/03/23 19:12	1
Cadmium	<0.17		0.50	0.17	ug/L		01/03/23 09:28	01/03/23 19:12	1
Chromium	<1.1		5.0	1.1	ug/L		01/03/23 09:28	01/03/23 19:12	1
Cobalt	<0.40		1.0	0.40	ug/L		01/03/23 09:28	01/03/23 19:12	1
Copper	<0.50		2.0	0.50	ug/L		01/03/23 09:28	01/03/23 19:12	1
Lead	<0.19		0.50	0.19	ug/L		01/03/23 09:28	01/03/23 19:12	1
Manganese	<0.79		2.5	0.79	ug/L		01/03/23 09:28	01/03/23 19:12	1
Nickel	<0.63		2.0	0.63	ug/L		01/03/23 09:28	01/03/23 19:12	1
Selenium	<0.98		2.5	0.98	ug/L		01/03/23 09:28	01/03/23 19:12	1
Silver	<0.12		0.50	0.12	ug/L		01/03/23 09:28	01/03/23 19:12	1
Titanium	<1.8		5.0	1.8	ug/L		01/03/23 09:28	01/03/23 19:12	1
Zinc	<6.9		20	6.9	ug/L		01/03/23 09:28	01/03/23 19:12	1

Lab Sample ID: MB 500-692211/1-A
Matrix: Water
Analysis Batch: 692599

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 692211

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		01/03/23 09:28	01/04/23 19:50	1
Vanadium	<2.2		5.0	2.2	ug/L		01/03/23 09:28	01/04/23 19:50	1

Lab Sample ID: LCS 500-692211/2-A
Matrix: Water
Analysis Batch: 692431

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 692211

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	500	497		ug/L		99	80 - 120
Barium	500	513		ug/L		103	80 - 120
Beryllium	50.0	49.6		ug/L		99	80 - 120
Cadmium	50.0	49.2		ug/L		98	80 - 120
Chromium	200	205		ug/L		102	80 - 120
Cobalt	500	513		ug/L		103	80 - 120
Copper	250	255		ug/L		102	80 - 120
Lead	100	103		ug/L		103	80 - 120
Manganese	500	514		ug/L		103	80 - 120
Nickel	500	522		ug/L		104	80 - 120
Selenium	100	102		ug/L		102	80 - 120
Silver	50.0	48.3		ug/L		97	80 - 120
Titanium	1000	1020		ug/L		102	80 - 120
Zinc	500	511		ug/L		102	80 - 120

Lab Sample ID: LCS 500-692211/2-A
Matrix: Water
Analysis Batch: 692599

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 692211

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	102		ug/L		102	80 - 120

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 500-692211/2-A
Matrix: Water
Analysis Batch: 692599

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 692211

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Vanadium	500	507		ug/L		101	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-692296/12-A
Matrix: Water
Analysis Batch: 692442

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 692296

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.098		0.20	0.098	ug/L		01/03/23 15:15	01/04/23 08:35	1

Lab Sample ID: LCS 500-692296/13-A
Matrix: Water
Analysis Batch: 692442

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 692296

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.98	1.89		ug/L		95	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-692916/30
Matrix: Water
Analysis Batch: 692916

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.17		0.20	0.17	mg/L			01/05/23 22:06	1
Sulfate	<0.095		0.20	0.095	mg/L			01/05/23 22:06	1
Fluoride	<0.067		0.20	0.067	mg/L			01/05/23 22:06	1

Lab Sample ID: LCS 500-692916/31
Matrix: Water
Analysis Batch: 692916

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	3.00	2.92		mg/L		97	90 - 110
Sulfate	5.00	4.97		mg/L		99	90 - 110
Fluoride	1.00	1.06		mg/L		106	90 - 110

Method: N07-0003 - Enzymatic Nitrate-Nitrite Nitrogen

Lab Sample ID: MB 500-692250/45
Matrix: Water
Analysis Batch: 692250

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	<0.041		0.10	0.041	mg/L			01/03/23 10:22	1

Method: N07-0003 - Enzymatic Nitrate-Nitrite Nitrogen (Continued)

Lab Sample ID: LCS 500-692250/46
Matrix: Water
Analysis Batch: 692250

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate Nitrite as N			1.00	1.01		mg/L		101	90 - 110		

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-691704/3
Matrix: Water
Analysis Batch: 691704

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			12/28/22 16:33	1

Lab Sample ID: LCS 500-691704/4
Matrix: Water
Analysis Batch: 691704

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Alkalinity			100	110		mg/L		110	90 - 110		

Lab Sample ID: 500-227292-3 DU
Matrix: Water
Analysis Batch: 691704

Client Sample ID: MW-17WT
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity	280			276		mg/L				0.2	20

Lab Chronicle

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Client Sample ID: MW-14WT
Date Collected: 12/20/22 08:00
Date Received: 12/22/22 10:25

Lab Sample ID: 500-227292-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	691907	JDD	EET CHI	12/30/22 13:40
Dissolved	Prep	3005A			692211	BDE	EET CHI	01/03/23 09:28 - 01/03/23 09:58 [1]
Dissolved	Analysis	6020A		1	692431	FXG	EET CHI	01/03/23 20:15
Dissolved	Prep	3005A			692211	BDE	EET CHI	01/03/23 09:28 - 01/03/23 09:58 [1]
Dissolved	Analysis	6020A		1	692599	FXG	EET CHI	01/04/23 20:51
Dissolved	Prep	7470A			692296	MJG	EET CHI	01/03/23 15:15 - 01/03/23 17:15 [1]
Dissolved	Analysis	7470A		1	692442	MJG	EET CHI	01/04/23 08:40
Dissolved	Prep	3005A			692211	BDE	EET CHI	01/03/23 09:28 - 01/03/23 09:58 [1]
Dissolved	Analysis	SM 2340B		1	692688	FXG	EET CHI	01/05/23 15:26
Dissolved	Analysis	300.0		2	692916	RES	EET CHI	01/05/23 23:22
Total/NA	Analysis	300.0		1	692916	RES	EET CHI	01/05/23 22:31
Dissolved	Analysis	N07-0003		1	692250	LP	EET CHI	01/03/23 10:27
Dissolved	Analysis	SM 2320B		1	691704	EH	EET CHI	12/28/22 18:47

Client Sample ID: MW-16
Date Collected: 12/20/22 10:00
Date Received: 12/22/22 10:25

Lab Sample ID: 500-227292-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	691907	JDD	EET CHI	12/30/22 14:04
Dissolved	Prep	3005A			692211	BDE	EET CHI	01/03/23 09:28 - 01/03/23 09:58 [1]
Dissolved	Analysis	6020A		1	692431	FXG	EET CHI	01/03/23 20:18
Dissolved	Prep	3005A			692211	BDE	EET CHI	01/03/23 09:28 - 01/03/23 09:58 [1]
Dissolved	Analysis	6020A		1	692599	FXG	EET CHI	01/04/23 20:55
Dissolved	Prep	7470A			692296	MJG	EET CHI	01/03/23 15:15 - 01/03/23 17:15 [1]
Dissolved	Analysis	7470A		1	692442	MJG	EET CHI	01/04/23 08:42
Dissolved	Prep	3005A			692211	BDE	EET CHI	01/03/23 09:28 - 01/03/23 09:58 [1]
Dissolved	Analysis	SM 2340B		1	692688	FXG	EET CHI	01/05/23 15:26
Dissolved	Analysis	300.0		2	692916	RES	EET CHI	01/06/23 00:00
Total/NA	Analysis	300.0		1	692916	RES	EET CHI	01/05/23 22:44
Total/NA	Analysis	300.0		2	692916	RES	EET CHI	01/05/23 22:57
Dissolved	Analysis	N07-0003		1	692250	LP	EET CHI	01/03/23 10:28
Dissolved	Analysis	SM 2320B		1	691704	EH	EET CHI	12/28/22 18:56

Client Sample ID: MW-17WT
Date Collected: 12/20/22 11:00
Date Received: 12/22/22 10:25

Lab Sample ID: 500-227292-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	691907	JDD	EET CHI	12/30/22 14:29
Dissolved	Prep	3005A			692211	BDE	EET CHI	01/03/23 09:28 - 01/03/23 09:58 [1]
Dissolved	Analysis	6020A		1	692431	FXG	EET CHI	01/03/23 20:22
Dissolved	Prep	3005A			692211	BDE	EET CHI	01/03/23 09:28 - 01/03/23 09:58 [1]
Dissolved	Analysis	6020A		1	692599	FXG	EET CHI	01/04/23 20:58

Lab Chronicle

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-227292-1

Client Sample ID: MW-17WT

Lab Sample ID: 500-227292-3

Date Collected: 12/20/22 11:00

Matrix: Water

Date Received: 12/22/22 10:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	7470A			692296	MJG	EET CHI	01/03/23 15:15 - 01/03/23 17:15 [1]
Dissolved	Analysis	7470A		1	692442	MJG	EET CHI	01/04/23 08:44
Dissolved	Prep	3005A			692211	BDE	EET CHI	01/03/23 09:28 - 01/03/23 09:58 [1]
Dissolved	Analysis	SM 2340B		1	692688	FXG	EET CHI	01/05/23 15:26
Dissolved	Analysis	300.0		2	692916	RES	EET CHI	01/06/23 00:13
Total/NA	Analysis	300.0		1	692916	RES	EET CHI	01/05/23 23:09
Dissolved	Analysis	N07-0003		1	692250	LP	EET CHI	01/03/23 10:28
Dissolved	Analysis	SM 2320B		1	691704	EH	EET CHI	12/28/22 19:03

Client Sample ID: Trip Blank-VOC

Lab Sample ID: 500-227292-4

Date Collected: 12/20/22 00:00

Matrix: Water

Date Received: 12/22/22 10:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	691907	JDD	EET CHI	12/30/22 14:52

[1] Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-227292-1
Project/Site: Vernon County Landfill Expansion

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999580010	08-31-23

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534-5211

Chain of Custody Record

eurofins

Client Information	Sampler	Lab PM	Carrier Tracking Nos	COC No
	Veronica Aranda	Fredrick Sandie		500 108419-45648 1
Client Contact: Mr Brian Kent	Phone 715.933.2351	E-Mail Sandra Fredrick@et eurofinsus com	State of Origin	Page Page 1 of 4
Company Short Elliott Hendrickson Inc dba SEH	PWSID			Job # 500-227292
Address 10 North Bridge Street	Due Date Requested.			
City Chippewa Falls	TAT Requested (days)			
State Zip WI 54729-3374	Compliance Project: Δ Yes Δ No			
Phone	PO # Purchase Order not required			
Email bkent@sehinc.com	WO #			
Project Name Vernon Co LF	Project # 50006595			
Site	SSOW#			

500-227292 COC

Analysis Requested

Preservation Codes
A HCL M Hexane
B NaOH N None
C Zn Acetate O AsNaO2
D Nitric Acid P Na2O4S
E NaHSO4 Q Na2SO3
F MeOH R Na2S2O3
G Amchlor S H2SO4
H Ascorbic Acid T TSP Dodecahydrate
I Ice U Acetone
J DI Water V MCAA
K EDTA W pH 4 5
L EDA Y Trizma
Z other (specify)
Other

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp G=grab)	Matrix (W=water S=solid O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SM2340B Hardness Diss Field Filtered	2320B Alk Diss Field Filtered	300 Chloride Diss Field Filtered	8260B VOC	6020A Cu/Mn/Zn Diss Field Filtered	300 Sulfate	6020A 7470A Diss Field Filtered	300 Fluoride	353.2 N+N	6020A Sb/Be/Co/Ni/Tl/V Diss. Field Filtered	Total Number of containers	Special Instructions/Note
			Preservation Code				D	N	N	A	D	N	D	N	S	D		
1 MW-14 WT	12/20/22	9:00	G	Water			X	X	X	X	X	X	X	X	X			
[redacted]	[redacted]	[redacted]	[redacted]	~~Water~~			[redacted]										VA	
2 MW-16	12/20/22	10:00	G	Water			X	X	X	X	X	X	X	X	X			
3 MW-17WT	12/20/22	11:00	G	Water			X	X	X	X	X	X	X	X	X	X		
				Water														
4 trip blank-VOC				Water														
				Water														
				Water														
				Water														
				Water														
				Water														

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment: icecooler
Relinquished by Veronica Aranda	Date/Time 12/21/2022	Company SEH, Inc.	Received by [redacted] Date/Time 12/22/22 1025 Company EEHA
Relinquished by	Date/Time	Company	Received by Date/Time Company
Relinquished by	Date/Time	Company	Received by Date/Time Company

Custody Seals Intact: X Yes ☐ No
Custody Seal No 2110905
Cooler Temperature(s) °C and Other Remark 2.0→1.0


TAL-0090(1016)

ORIGIN ID:RRLA (715) 933-2351
VERONICA ARANDA
SHORT ELLIOT HENDRICKSON
10 NORTH BRIGDE ST.

CHIPPEWA FALLS, WI 54729
UNITED STATES US

SHIP DATE: 09DEC22
ACTWGT: 25
CAD: 02[illegible]

500-227292 Waybi

TO SAMPLE RECEIPT
EUROFINS
2417 BOND ST.

UNIVERSITY PARK IL 60484

(262) 202-6955 REF:

INV:
PO DEPT:

RMA

FedEx Express

FedEx
TRK# 0221 6155 6317 5260

THU - 22 DEC 10:30A
PRIORITY OVERNIGH

79 JOTA

60484
IL-US ORD

EXP 11/23

48QT

Login Sample Receipt Checklist

Client: Vernon County Solid Waste & Recycling

Job Number: 500-227292-1

Login Number: 227292
List Number: 1
Creator: Scott, Sherri L

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Stacie Sanborn
Vernon County Solid Waste & Recycling
S3705 County Road LF
Viroqua, Wisconsin 54665

Generated 2/7/2023 9:23:11 AM

JOB DESCRIPTION

Vernon County Landfill Expansion

JOB NUMBER

500-228520-1

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

Job Notes

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Authorization



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Authorized for release by
Sandie Fredrick, Project Manager II
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

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Job ID: 500-228520-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-228520-1

Receipt
The samples were received on 1/24/2023 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was -0.5º C.

Receipt Exceptions
The container label for the following sample(s) did not match the information listed on the Chain-of-Custody (COC): Sample #2 "MW16" is checked off for "6020A-Sb/Be/Co/Ni/Tl/V" however extra nitric with those elements listed is for sample #3 "MW-17WT"

GC/MS VOA
Method 8260B: The following sample is a labeled trip blank. This trip blank ran twice and had matching detects above the reporting limit.Trip Blank-VOC (500-228520-4)

Method 8260B: Acetone was detected in the following samples: MW-14WT (500-228520-1) and Trip Blank-VOC (500-228520-4). Acetone is a known lab contaminant; therefore all low level detects for this compound could be suspected as lab contamination.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
Method 6020B: The interference check standard solution (ICSA) associated with batch 500-696481 had results for Barium above the method detection limit (MDL). The vendor acknowledges that this element is trace impurities in the ICSA standard. These results are not indicative of a matrix interference.

Method 6020B: The method blank for preparation batch 500-695780 contained Boron above the reporting limit (RL). None of the samples associated with this method blank contained the target compound; therefore, re-extraction and/or re-analysis of samples were not performed.

Method 6020B: The low level continuing calibration verification (ICVL) associated with batch 500-697312 recovered above the upper control limit for Copper. The samples associated with this ICVL were non-detects for the affected analyte; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Field Service / Mobile Lab
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-228520-1

Client Sample ID: MW-14WT — Lab Sample ID: 500-228520-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Acetone	4.1	J	10	1.7	ug/L	1		8260B	Total/NA
Xylenes, Total	0.32	J	1.0	0.22	ug/L	1		8260B	Total/NA
Arsenic	0.55	J	1.0	0.23	ug/L	1		6020B	Dissolved
Barium	47.5		2.5	0.73	ug/L	1		6020B	Dissolved
Boron	46.1	J B	50.0	12.7	ug/L	1		6020B	Dissolved
Copper	0.83	J B ^	2.0	0.50	ug/L	1		6020B	Dissolved
Manganese	272		2.5	0.79	ug/L	1		6020B	Dissolved
Hardness as calcium carbonate	238		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	5.6		0.20	0.17	mg/L	1		300.0	Dissolved
Fluoride	0.21		0.20	0.067	mg/L	1		300.0	Dissolved
Sulfate	3.1		0.20	0.095	mg/L	1		300.0	Dissolved
Nitrate Nitrite as N	0.25		0.10	0.041	mg/L	1		N07-0003	Dissolved
Alkalinity	211		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: MW-16 — Lab Sample ID: 500-228520-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Barium	66.6		2.5	0.73	ug/L	1		6020B	Dissolved
Boron	45.0	J B	50.0	12.7	ug/L	1		6020B	Dissolved
Copper	1.5	J B ^	2.0	0.50	ug/L	1		6020B	Dissolved
Manganese	4.4		2.5	0.79	ug/L	1		6020B	Dissolved
Hardness as calcium carbonate	399		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	7.1		0.40	0.34	mg/L	2		300.0	Dissolved
Fluoride	0.18	J	0.20	0.067	mg/L	1		300.0	Dissolved
Sulfate	17.7		0.40	0.19	mg/L	2		300.0	Dissolved
Nitrate Nitrite as N	1.1		0.10	0.041	mg/L	1		N07-0003	Dissolved
Alkalinity	357		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: MW-17WT — Lab Sample ID: 500-228520-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Barium	69.4		2.5	0.73	ug/L	1		6020B	Dissolved
Boron	47.8	J B	50.0	12.7	ug/L	1		6020B	Dissolved
Copper	1.2	J B ^	2.0	0.50	ug/L	1		6020B	Dissolved
Lead	0.39	J	0.50	0.19	ug/L	1		6020B	Dissolved
Manganese	4.5		2.5	0.79	ug/L	1		6020B	Dissolved
Mercury	0.45	B	0.20	0.079	ug/L	1		7470A	Dissolved
Hardness as calcium carbonate	391		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	6.3		0.40	0.34	mg/L	2		300.0	Dissolved
Fluoride	0.18	J	0.20	0.067	mg/L	1		300.0	Dissolved
Sulfate	15.6		0.40	0.19	mg/L	2		300.0	Dissolved
Nitrate Nitrite as N	1.1		0.10	0.041	mg/L	1		N07-0003	Dissolved
Alkalinity	352		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: Trip Blank-VOC — Lab Sample ID: 500-228520-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Acetone	14		10	1.7	ug/L	1		8260B	Total/NA
Tetrahydrofuran	10		10	1.9	ug/L	1		8260B	Total/NA
Toluene	0.72		0.50	0.15	ug/L	1		8260B	Total/NA
1,2,4-Trimethylbenzene	0.78	J B	1.0	0.36	ug/L	1		8260B	Total/NA
Xylenes, Total	0.75	J	1.0	0.22	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-228520-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	EET CHI
6020B	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	EET CHI
300.0	Anions, Ion Chromatography	EPA	EET CHI
N07-0003	Enzymatic Nitrate-Nitrite Nitrogen	EPA	EET CHI
SM 2320B	Alkalinity	SM	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
5030B	Purge and Trap	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-228520-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-228520-1	MW-14WT	Water	01/23/23 08:00	01/24/23 09:30
500-228520-2	MW-16	Water	01/23/23 09:00	01/24/23 09:30
500-228520-3	MW-17WT	Water	01/23/23 11:00	01/24/23 09:30
500-228520-4	Trip Blank-VOC	Water	01/23/23 00:00	01/24/23 09:30

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-228520-1

Client Sample ID: MW-14WT
Date Collected: 01/23/23 08:00
Date Received: 01/24/23 09:30

Lab Sample ID: 500-228520-1
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	4.1	J	10	1.7	ug/L			01/25/23 14:59	1
Benzene	<0.15		0.50	0.15	ug/L			01/25/23 14:59	1
Bromobenzene	<0.36		1.0	0.36	ug/L			01/25/23 14:59	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			01/25/23 14:59	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			01/25/23 14:59	1
Bromoform	<0.48		1.0	0.48	ug/L			01/25/23 14:59	1
Bromomethane	<0.80		3.0	0.80	ug/L			01/25/23 14:59	1
2-Butanone (MEK)	<2.1		5.0	2.1	ug/L			01/25/23 14:59	1
Carbon disulfide	<0.45		2.0	0.45	ug/L			01/25/23 14:59	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			01/25/23 14:59	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			01/25/23 14:59	1
Chloroethane	<0.51		1.0	0.51	ug/L			01/25/23 14:59	1
Chloroform	<0.37		2.0	0.37	ug/L			01/25/23 14:59	1
Chloromethane	<0.32		1.0	0.32	ug/L			01/25/23 14:59	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			01/25/23 14:59	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			01/25/23 14:59	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			01/25/23 14:59	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			01/25/23 14:59	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			01/25/23 14:59	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			01/25/23 14:59	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			01/25/23 14:59	1
Dibromomethane	<0.27		1.0	0.27	ug/L			01/25/23 14:59	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			01/25/23 14:59	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			01/25/23 14:59	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			01/25/23 14:59	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			01/25/23 14:59	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			01/25/23 14:59	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			01/25/23 14:59	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			01/25/23 14:59	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			01/25/23 14:59	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			01/25/23 14:59	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			01/25/23 14:59	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			01/25/23 14:59	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			01/25/23 14:59	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			01/25/23 14:59	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			01/25/23 14:59	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			01/25/23 14:59	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			01/25/23 14:59	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			01/25/23 14:59	1
Naphthalene	<0.34		1.0	0.34	ug/L			01/25/23 14:59	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			01/25/23 14:59	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			01/25/23 14:59	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			01/25/23 14:59	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			01/25/23 14:59	1
Styrene	<0.39		1.0	0.39	ug/L			01/25/23 14:59	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			01/25/23 14:59	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			01/25/23 14:59	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			01/25/23 14:59	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			01/25/23 14:59	1

Client Sample ID: MW-14WT
Lab Sample ID: 500-228520-1

Date Collected: 01/23/23 08:00
Matrix: Water
Date Received: 01/24/23 09:30

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<1.9		10	1.9	ug/L			01/25/23 14:59	1
Toluene	<0.15		0.50	0.15	ug/L			01/25/23 14:59	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			01/25/23 14:59	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			01/25/23 14:59	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			01/25/23 14:59	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			01/25/23 14:59	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			01/25/23 14:59	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			01/25/23 14:59	1
Trichloroethene	<0.16		0.50	0.16	ug/L			01/25/23 14:59	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			01/25/23 14:59	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			01/25/23 14:59	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			01/25/23 14:59	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			01/25/23 14:59	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			01/25/23 14:59	1
Xylenes, Total	**0.32**	**J**	1.0	0.22	ug/L			01/25/23 14:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*72 - 124*		*01/25/23 14:59*	*1*
Dibromofluoromethane (Surr)	*98*		*75 - 120*		*01/25/23 14:59*	*1*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 126*		*01/25/23 14:59*	*1*
Toluene-d8 (Surr)	*95*		*75 - 120*		*01/25/23 14:59*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.55**	**J**	1.0	0.23	ug/L		01/25/23 08:45	01/26/23 17:10	1
Barium	**47.5**		2.5	0.73	ug/L		01/25/23 08:45	01/30/23 20:15	1
Boron	**46.1**	**J B**	50.0	12.7	ug/L		01/25/23 08:45	02/01/23 19:17	1
Cadmium	<0.17		0.50	0.17	ug/L		01/25/23 08:45	01/26/23 17:10	1
Chromium	<1.1		5.0	1.1	ug/L		01/25/23 08:45	01/26/23 17:10	1
Copper	**0.83**	**J B ^**	2.0	0.50	ug/L		01/25/23 08:45	02/01/23 19:17	1
Lead	<0.19		0.50	0.19	ug/L		01/25/23 08:45	01/26/23 17:10	1
Manganese	**272**		2.5	0.79	ug/L		01/25/23 08:45	01/26/23 17:10	1
Selenium	<0.98		2.5	0.98	ug/L		01/25/23 08:45	01/26/23 17:10	1
Silver	<0.12		0.50	0.12	ug/L		01/25/23 08:45	01/26/23 17:10	1
Zinc	<6.9		20.0	6.9	ug/L		01/25/23 08:45	01/26/23 17:10	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.079	F2	0.20	0.079	ug/L		01/26/23 15:55	01/27/23 07:57	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**238**		0.91	0.46	mg/L		01/25/23 08:45	01/31/23 13:13	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	**5.6**		0.20	0.17	mg/L			01/26/23 18:45	1
Fluoride (EPA 300.0)	**0.21**		0.20	0.067	mg/L			01/26/23 18:45	1
Sulfate (EPA 300.0)	**3.1**		0.20	0.095	mg/L			01/26/23 18:45	1
Nitrate Nitrite as N (EPA N07-0003)	**0.25**		0.10	0.041	mg/L			01/30/23 09:00	1
Alkalinity (SM 2320B)	**211**		5.0	3.7	mg/L			01/26/23 12:08	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-228520-1

Client Sample ID: MW-16
Date Collected: 01/23/23 09:00
Date Received: 01/24/23 09:30

Lab Sample ID: 500-228520-2
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<1.7		10	1.7	ug/L			01/25/23 15:25	1
Benzene	<0.15		0.50	0.15	ug/L			01/25/23 15:25	1
Bromobenzene	<0.36		1.0	0.36	ug/L			01/25/23 15:25	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			01/25/23 15:25	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			01/25/23 15:25	1
Bromoform	<0.48		1.0	0.48	ug/L			01/25/23 15:25	1
Bromomethane	<0.80		3.0	0.80	ug/L			01/25/23 15:25	1
2-Butanone (MEK)	<2.1		5.0	2.1	ug/L			01/25/23 15:25	1
Carbon disulfide	<0.45		2.0	0.45	ug/L			01/25/23 15:25	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			01/25/23 15:25	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			01/25/23 15:25	1
Chloroethane	<0.51		1.0	0.51	ug/L			01/25/23 15:25	1
Chloroform	<0.37		2.0	0.37	ug/L			01/25/23 15:25	1
Chloromethane	<0.32		1.0	0.32	ug/L			01/25/23 15:25	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			01/25/23 15:25	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			01/25/23 15:25	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			01/25/23 15:25	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			01/25/23 15:25	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			01/25/23 15:25	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			01/25/23 15:25	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			01/25/23 15:25	1
Dibromomethane	<0.27		1.0	0.27	ug/L			01/25/23 15:25	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			01/25/23 15:25	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			01/25/23 15:25	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			01/25/23 15:25	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			01/25/23 15:25	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			01/25/23 15:25	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			01/25/23 15:25	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			01/25/23 15:25	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			01/25/23 15:25	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			01/25/23 15:25	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			01/25/23 15:25	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			01/25/23 15:25	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			01/25/23 15:25	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			01/25/23 15:25	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			01/25/23 15:25	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			01/25/23 15:25	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			01/25/23 15:25	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			01/25/23 15:25	1
Naphthalene	<0.34		1.0	0.34	ug/L			01/25/23 15:25	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			01/25/23 15:25	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			01/25/23 15:25	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			01/25/23 15:25	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			01/25/23 15:25	1
Styrene	<0.39		1.0	0.39	ug/L			01/25/23 15:25	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			01/25/23 15:25	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			01/25/23 15:25	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			01/25/23 15:25	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			01/25/23 15:25	1

Client Sample ID: MW-16
Lab Sample ID: 500-228520-2
Date Collected: 01/23/23 09:00
Matrix: Water
Date Received: 01/24/23 09:30

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<1.9		10	1.9	ug/L			01/25/23 15:25	1
Toluene	<0.15		0.50	0.15	ug/L			01/25/23 15:25	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			01/25/23 15:25	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			01/25/23 15:25	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			01/25/23 15:25	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			01/25/23 15:25	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			01/25/23 15:25	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			01/25/23 15:25	1
Trichloroethene	<0.16		0.50	0.16	ug/L			01/25/23 15:25	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			01/25/23 15:25	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			01/25/23 15:25	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			01/25/23 15:25	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			01/25/23 15:25	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			01/25/23 15:25	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			01/25/23 15:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*72 - 124*		*01/25/23 15:25*	*1*
Dibromofluoromethane (Surr)	*97*		*75 - 120*		*01/25/23 15:25*	*1*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 126*		*01/25/23 15:25*	*1*
Toluene-d8 (Surr)	*95*		*75 - 120*		*01/25/23 15:25*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		01/26/23 08:58	01/26/23 17:28	1
Barium	**66.6**		2.5	0.73	ug/L		01/26/23 08:58	01/30/23 19:48	1
Boron	**45.0**	**J B**	50.0	12.7	ug/L		01/26/23 08:58	02/01/23 19:27	1
Cadmium	<0.17		0.50	0.17	ug/L		01/26/23 08:58	01/26/23 17:28	1
Chromium	<1.1		5.0	1.1	ug/L		01/26/23 08:58	01/26/23 17:28	1
Copper	**1.5**	**J B ^**	2.0	0.50	ug/L		01/26/23 08:58	02/01/23 19:27	1
Lead	<0.19		0.50	0.19	ug/L		01/26/23 08:58	01/26/23 17:28	1
Manganese	**4.4**		2.5	0.79	ug/L		01/26/23 08:58	01/26/23 17:28	1
Selenium	<0.98		2.5	0.98	ug/L		01/26/23 08:58	01/26/23 17:28	1
Silver	<0.12		0.50	0.12	ug/L		01/26/23 08:58	01/26/23 17:28	1
Zinc	<6.9		20.0	6.9	ug/L		01/26/23 08:58	01/26/23 17:28	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.079		0.20	0.079	ug/L		01/26/23 15:55	01/27/23 08:25	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**399**		0.91	0.46	mg/L		01/25/23 08:45	01/31/23 13:13	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	**7.1**		0.40	0.34	mg/L			01/26/23 18:58	2
Fluoride (EPA 300.0)	**0.18**	**J**	0.20	0.067	mg/L			01/28/23 12:49	1
Sulfate (EPA 300.0)	**17.7**		0.40	0.19	mg/L			01/26/23 18:58	2
Nitrate Nitrite as N (EPA N07-0003)	**1.1**		0.10	0.041	mg/L			01/30/23 08:58	1
Alkalinity (SM 2320B)	**357**		5.0	3.7	mg/L			01/26/23 12:16	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-228520-1

Client Sample ID: MW-17WT
Date Collected: 01/23/23 11:00
Date Received: 01/24/23 09:30

Lab Sample ID: 500-228520-3
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<1.7		10	1.7	ug/L			01/25/23 15:52	1
Benzene	<0.15		0.50	0.15	ug/L			01/25/23 15:52	1
Bromobenzene	<0.36		1.0	0.36	ug/L			01/25/23 15:52	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			01/25/23 15:52	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			01/25/23 15:52	1
Bromoform	<0.48		1.0	0.48	ug/L			01/25/23 15:52	1
Bromomethane	<0.80		3.0	0.80	ug/L			01/25/23 15:52	1
2-Butanone (MEK)	<2.1		5.0	2.1	ug/L			01/25/23 15:52	1
Carbon disulfide	<0.45		2.0	0.45	ug/L			01/25/23 15:52	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			01/25/23 15:52	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			01/25/23 15:52	1
Chloroethane	<0.51		1.0	0.51	ug/L			01/25/23 15:52	1
Chloroform	<0.37		2.0	0.37	ug/L			01/25/23 15:52	1
Chloromethane	<0.32		1.0	0.32	ug/L			01/25/23 15:52	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			01/25/23 15:52	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			01/25/23 15:52	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			01/25/23 15:52	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			01/25/23 15:52	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			01/25/23 15:52	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			01/25/23 15:52	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			01/25/23 15:52	1
Dibromomethane	<0.27		1.0	0.27	ug/L			01/25/23 15:52	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			01/25/23 15:52	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			01/25/23 15:52	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			01/25/23 15:52	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			01/25/23 15:52	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			01/25/23 15:52	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			01/25/23 15:52	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			01/25/23 15:52	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			01/25/23 15:52	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			01/25/23 15:52	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			01/25/23 15:52	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			01/25/23 15:52	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			01/25/23 15:52	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			01/25/23 15:52	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			01/25/23 15:52	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			01/25/23 15:52	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			01/25/23 15:52	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			01/25/23 15:52	1
Naphthalene	<0.34		1.0	0.34	ug/L			01/25/23 15:52	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			01/25/23 15:52	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			01/25/23 15:52	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			01/25/23 15:52	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			01/25/23 15:52	1
Styrene	<0.39		1.0	0.39	ug/L			01/25/23 15:52	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			01/25/23 15:52	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			01/25/23 15:52	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			01/25/23 15:52	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			01/25/23 15:52	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-228520-1

Client Sample ID: MW-17WT
Date Collected: 01/23/23 11:00
Date Received: 01/24/23 09:30

Lab Sample ID: 500-228520-3
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<1.9		10	1.9	ug/L			01/25/23 15:52	1
Toluene	<0.15		0.50	0.15	ug/L			01/25/23 15:52	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			01/25/23 15:52	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			01/25/23 15:52	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			01/25/23 15:52	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			01/25/23 15:52	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			01/25/23 15:52	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			01/25/23 15:52	1
Trichloroethene	<0.16		0.50	0.16	ug/L			01/25/23 15:52	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			01/25/23 15:52	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			01/25/23 15:52	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			01/25/23 15:52	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			01/25/23 15:52	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			01/25/23 15:52	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			01/25/23 15:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*72 - 124*		*01/25/23 15:52*	*1*
Dibromofluoromethane (Surr)	*97*		*75 - 120*		*01/25/23 15:52*	*1*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 126*		*01/25/23 15:52*	*1*
Toluene-d8 (Surr)	*95*		*75 - 120*		*01/25/23 15:52*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		01/26/23 08:58	01/26/23 17:52	1
Arsenic	<0.23		1.0	0.23	ug/L		01/26/23 08:58	01/26/23 17:52	1
Barium	**69.4**		2.5	0.73	ug/L		01/26/23 08:58	01/30/23 20:05	1
Beryllium	<0.53		1.0	0.53	ug/L		01/26/23 08:58	01/26/23 17:52	1
Boron	**47.8**	**J B**	50.0	12.7	ug/L		01/26/23 08:58	02/01/23 19:52	1
Cadmium	<0.17		0.50	0.17	ug/L		01/26/23 08:58	01/26/23 17:52	1
Chromium	<1.1		5.0	1.1	ug/L		01/26/23 08:58	01/26/23 17:52	1
Cobalt	<0.40		1.0	0.40	ug/L		01/26/23 08:58	01/26/23 17:52	1
Copper	**1.2**	**J B ^**	2.0	0.50	ug/L		01/26/23 08:58	02/01/23 19:52	1
Lead	**0.39**	**J**	0.50	0.19	ug/L		01/26/23 08:58	01/26/23 17:52	1
Manganese	**4.5**		2.5	0.79	ug/L		01/26/23 08:58	01/26/23 17:52	1
Nickel	<0.63		2.0	0.63	ug/L		01/26/23 08:58	01/26/23 17:52	1
Selenium	<0.98		2.5	0.98	ug/L		01/26/23 08:58	01/26/23 17:52	1
Silver	<0.12		0.50	0.12	ug/L		01/26/23 08:58	01/26/23 17:52	1
Thallium	<0.57		2.0	0.57	ug/L		01/26/23 08:58	01/26/23 17:52	1
Vanadium	<2.2		5.0	2.2	ug/L		01/26/23 08:58	01/26/23 17:52	1
Zinc	<6.9		20.0	6.9	ug/L		01/26/23 08:58	01/26/23 17:52	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.45**	**B**	0.20	0.079	ug/L		01/26/23 15:55	01/27/23 08:27	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**391**		0.91	0.46	mg/L		01/25/23 08:45	01/31/23 13:13	1

Client: Vernon County Solid Waste & Recycling
Job ID: 500-228520-1
Project/Site: Vernon County Landfill Expansion

Client Sample ID: MW-17WT
Lab Sample ID: 500-228520-3
Date Collected: 01/23/23 11:00
Matrix: Water
Date Received: 01/24/23 09:30

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	6.3		0.40	0.34	mg/L			01/26/23 19:11	2
Fluoride (EPA 300.0)	0.18	J	0.20	0.067	mg/L			01/28/23 12:37	1
Sulfate (EPA 300.0)	15.6		0.40	0.19	mg/L			01/26/23 19:11	2
Nitrate Nitrite as N (EPA N07-0003)	1.1		0.10	0.041	mg/L			01/30/23 09:00	1
Alkalinity (SM 2320B)	352		5.0	3.7	mg/L			01/31/23 12:14	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-228520-1

Client Sample ID: Trip Blank-VOC

Lab Sample ID: 500-228520-4

Date Collected: 01/23/23 00:00

Matrix: Water

Date Received: 01/24/23 09:30

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	14		10	1.7	ug/L			01/25/23 14:07	1
Benzene	<0.15		0.50	0.15	ug/L			01/25/23 14:07	1
Bromobenzene	<0.36		1.0	0.36	ug/L			01/25/23 14:07	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			01/25/23 14:07	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			01/25/23 14:07	1
Bromoform	<0.48		1.0	0.48	ug/L			01/25/23 14:07	1
Bromomethane	<0.80		3.0	0.80	ug/L			01/25/23 14:07	1
2-Butanone (MEK)	<2.1		5.0	2.1	ug/L			01/25/23 14:07	1
Carbon disulfide	<0.45		2.0	0.45	ug/L			01/25/23 14:07	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			01/25/23 14:07	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			01/25/23 14:07	1
Chloroethane	<0.51		1.0	0.51	ug/L			01/25/23 14:07	1
Chloroform	<0.37		2.0	0.37	ug/L			01/25/23 14:07	1
Chloromethane	<0.32		1.0	0.32	ug/L			01/25/23 14:07	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			01/25/23 14:07	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			01/25/23 14:07	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			01/25/23 14:07	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			01/25/23 14:07	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			01/25/23 14:07	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			01/25/23 14:07	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			01/25/23 14:07	1
Dibromomethane	<0.27		1.0	0.27	ug/L			01/25/23 14:07	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			01/25/23 14:07	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			01/25/23 14:07	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			01/25/23 14:07	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			01/25/23 14:07	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			01/25/23 14:07	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			01/25/23 14:07	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			01/25/23 14:07	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			01/25/23 14:07	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			01/25/23 14:07	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			01/25/23 14:07	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			01/25/23 14:07	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			01/25/23 14:07	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			01/25/23 14:07	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			01/25/23 14:07	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			01/25/23 14:07	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			01/25/23 14:07	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			01/25/23 14:07	1
Naphthalene	<0.34		1.0	0.34	ug/L			01/25/23 14:07	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			01/25/23 14:07	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			01/25/23 14:07	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			01/25/23 14:07	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			01/25/23 14:07	1
Styrene	<0.39		1.0	0.39	ug/L			01/25/23 14:07	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			01/25/23 14:07	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			01/25/23 14:07	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			01/25/23 14:07	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			01/25/23 14:07	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-228520-1

Client Sample ID: Trip Blank-VOC
Lab Sample ID: 500-228520-4
Date Collected: 01/23/23 00:00
Matrix: Water
Date Received: 01/24/23 09:30

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	**10**		10	1.9	ug/L			01/25/23 14:07	1
Toluene	**0.72**		0.50	0.15	ug/L			01/25/23 14:07	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			01/25/23 14:07	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			01/25/23 14:07	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			01/25/23 14:07	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			01/25/23 14:07	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			01/25/23 14:07	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			01/25/23 14:07	1
Trichloroethene	<0.16		0.50	0.16	ug/L			01/25/23 14:07	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			01/25/23 14:07	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			01/25/23 14:07	1
1,2,4-Trimethylbenzene	**0.78**	**J B**	1.0	0.36	ug/L			01/25/23 14:07	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			01/25/23 14:07	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			01/25/23 14:07	1
Xylenes, Total	**0.75**	**J**	1.0	0.22	ug/L			01/25/23 14:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*72 - 124*		*01/25/23 14:07*	*1*
Dibromofluoromethane (Surr)	*97*		*75 - 120*		*01/25/23 14:07*	*1*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 126*		*01/25/23 14:07*	*1*
Toluene-d8 (Surr)	*94*		*75 - 120*		*01/25/23 14:07*	*1*

Definitions/Glossary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-228520-1
Project/Site: Vernon County Landfill Expansion

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Reported value was between the limit of detection and the limit of quantitation.

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
B	Compound was found in the blank and sample.
F2	MS/MSD RPD exceeds control limits
J	Reported value was between the limit of detection and the limit of quantitation.

General Chemistry

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

GC/MS VOA

Analysis Batch: 695530

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-1	MW-14WT	Total/NA	Water	8260B	
500-228520-2	MW-16	Total/NA	Water	8260B	
500-228520-3	MW-17WT	Total/NA	Water	8260B	
500-228520-4	Trip Blank-VOC	Total/NA	Water	8260B	
MB 500-695530/7	Method Blank	Total/NA	Water	8260B	
LCS 500-695530/5	Lab Control Sample	Total/NA	Water	8260B	

Metals

Prep Batch: 695558

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-1	MW-14WT	Dissolved	Water	3005A	
500-228520-2	MW-16	Dissolved	Water	3005A	
500-228520-3	MW-17WT	Dissolved	Water	3005A	
MB 500-695558/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-695558/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 695780

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-2	MW-16	Dissolved	Water	3005A	
500-228520-3	MW-17WT	Dissolved	Water	3005A	
MB 500-695780/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-695780/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
500-228520-2 MS	MW-16	Dissolved	Water	3005A	
500-228520-2 MSD	MW-16	Dissolved	Water	3005A	
500-228520-2 DU	MW-16	Dissolved	Water	3005A	

Prep Batch: 695914

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-1	MW-14WT	Dissolved	Water	7470A	
500-228520-2	MW-16	Dissolved	Water	7470A	
500-228520-3	MW-17WT	Dissolved	Water	7470A	
MB 500-695914/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-695914/13-A	Lab Control Sample	Total/NA	Water	7470A	
500-228520-1 MS	MW-14WT	Dissolved	Water	7470A	
500-228520-1 MSD	MW-14WT	Dissolved	Water	7470A	
500-228520-1 DU	MW-14WT	Dissolved	Water	7470A	

Analysis Batch: 696005

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-1	MW-14WT	Dissolved	Water	6020B	695558
500-228520-2	MW-16	Dissolved	Water	6020B	695780
500-228520-3	MW-17WT	Dissolved	Water	6020B	695780
MB 500-695558/1-A	Method Blank	Total Recoverable	Water	6020B	695558
MB 500-695780/1-A	Method Blank	Total Recoverable	Water	6020B	695780
LCS 500-695558/2-A	Lab Control Sample	Total Recoverable	Water	6020B	695558
LCS 500-695780/2-A	Lab Control Sample	Total Recoverable	Water	6020B	695780
500-228520-2 MS	MW-16	Dissolved	Water	6020B	695780
500-228520-2 MSD	MW-16	Dissolved	Water	6020B	695780
500-228520-2 DU	MW-16	Dissolved	Water	6020B	695780

Metals

Analysis Batch: 696041

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-1	MW-14WT	Dissolved	Water	7470A	695914
500-228520-2	MW-16	Dissolved	Water	7470A	695914
500-228520-3	MW-17WT	Dissolved	Water	7470A	695914
MB 500-695914/12-A	Method Blank	Total/NA	Water	7470A	695914
LCS 500-695914/13-A	Lab Control Sample	Total/NA	Water	7470A	695914
500-228520-1 MS	MW-14WT	Dissolved	Water	7470A	695914
500-228520-1 MSD	MW-14WT	Dissolved	Water	7470A	695914
500-228520-1 DU	MW-14WT	Dissolved	Water	7470A	695914

Analysis Batch: 696481

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-1	MW-14WT	Dissolved	Water	6020B	695558
500-228520-2	MW-16	Dissolved	Water	6020B	695780
500-228520-3	MW-17WT	Dissolved	Water	6020B	695780
MB 500-695558/1-A	Method Blank	Total Recoverable	Water	6020B	695558
MB 500-695780/1-A	Method Blank	Total Recoverable	Water	6020B	695780
LCS 500-695558/2-A	Lab Control Sample	Total Recoverable	Water	6020B	695558
LCS 500-695780/2-A	Lab Control Sample	Total Recoverable	Water	6020B	695780
500-228520-2 MS	MW-16	Dissolved	Water	6020B	695780
500-228520-2 MSD	MW-16	Dissolved	Water	6020B	695780
500-228520-2 DU	MW-16	Dissolved	Water	6020B	695780

Analysis Batch: 696526

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-1	MW-14WT	Dissolved	Water	SM 2340B	695558
500-228520-2	MW-16	Dissolved	Water	SM 2340B	695558
500-228520-3	MW-17WT	Dissolved	Water	SM 2340B	695558

Analysis Batch: 697312

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-1	MW-14WT	Dissolved	Water	6020B	695558
500-228520-2	MW-16	Dissolved	Water	6020B	695780
500-228520-3	MW-17WT	Dissolved	Water	6020B	695780
MB 500-695558/1-A	Method Blank	Total Recoverable	Water	6020B	695558
MB 500-695780/1-A	Method Blank	Total Recoverable	Water	6020B	695780
LCS 500-695558/2-A	Lab Control Sample	Total Recoverable	Water	6020B	695558
LCS 500-695780/2-A	Lab Control Sample	Total Recoverable	Water	6020B	695780
500-228520-2 MS	MW-16	Dissolved	Water	6020B	695780
500-228520-2 MSD	MW-16	Dissolved	Water	6020B	695780
500-228520-2 DU	MW-16	Dissolved	Water	6020B	695780

General Chemistry

Analysis Batch: 695886

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-1	MW-14WT	Dissolved	Water	SM 2320B	
500-228520-2	MW-16	Dissolved	Water	SM 2320B	
MB 500-695886/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-695886/4	Lab Control Sample	Total/NA	Water	SM 2320B	
500-228520-2 DU	MW-16	Dissolved	Water	SM 2320B	

General Chemistry

Analysis Batch: 695991

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-1	MW-14WT	Dissolved	Water	300.0	
500-228520-2	MW-16	Dissolved	Water	300.0	
500-228520-3	MW-17WT	Dissolved	Water	300.0	
MB 500-695991/3	Method Blank	Total/NA	Water	300.0	
LCS 500-695991/4	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 696145

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-2	MW-16	Dissolved	Water	300.0	
500-228520-3	MW-17WT	Dissolved	Water	300.0	
MB 500-696145/11	Method Blank	Total/NA	Water	300.0	
LCS 500-696145/12	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 696282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-1	MW-14WT	Dissolved	Water	N07-0003	
500-228520-2	MW-16	Dissolved	Water	N07-0003	
500-228520-3	MW-17WT	Dissolved	Water	N07-0003	
MB 500-696282/13	Method Blank	Total/NA	Water	N07-0003	
LCS 500-696282/14	Lab Control Sample	Total/NA	Water	N07-0003	
500-228520-2 MS	MW-16	Dissolved	Water	N07-0003	
500-228520-2 MSD	MW-16	Dissolved	Water	N07-0003	

Analysis Batch: 696554

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-228520-3	MW-17WT	Dissolved	Water	SM 2320B	
MB 500-696554/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-696554/4	Lab Control Sample	Total/NA	Water	SM 2320B	

Surrogate Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-228520-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	DBFM	DCA	TOL
Lab Sample ID	Client Sample ID	(72-124)	(75-120)	(75-126)	(75-120)
500-228520-1	MW-14WT	101	98	106	95
500-228520-2	MW-16	99	97	106	95
500-228520-3	MW-17WT	99	97	107	95
500-228520-4	Trip Blank-VOC	100	97	106	94
LCS 500-695530/5	Lab Control Sample	101	87	96	98
MB 500-695530/7	Method Blank	104	97	104	95

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-695530/7
Matrix: Water
Analysis Batch: 695530

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<1.7		10	1.7	ug/L			01/25/23 12:21	1
Benzene	<0.15		0.50	0.15	ug/L			01/25/23 12:21	1
Bromobenzene	<0.36		1.0	0.36	ug/L			01/25/23 12:21	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			01/25/23 12:21	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			01/25/23 12:21	1
Bromoform	<0.48		1.0	0.48	ug/L			01/25/23 12:21	1
Bromomethane	<0.80		3.0	0.80	ug/L			01/25/23 12:21	1
2-Butanone (MEK)	<2.1		5.0	2.1	ug/L			01/25/23 12:21	1
Carbon disulfide	<0.45		2.0	0.45	ug/L			01/25/23 12:21	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			01/25/23 12:21	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			01/25/23 12:21	1
Chloroethane	<0.51		1.0	0.51	ug/L			01/25/23 12:21	1
Chloroform	<0.37		2.0	0.37	ug/L			01/25/23 12:21	1
Chloromethane	<0.32		1.0	0.32	ug/L			01/25/23 12:21	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			01/25/23 12:21	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			01/25/23 12:21	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			01/25/23 12:21	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			01/25/23 12:21	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			01/25/23 12:21	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			01/25/23 12:21	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			01/25/23 12:21	1
Dibromomethane	<0.27		1.0	0.27	ug/L			01/25/23 12:21	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			01/25/23 12:21	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			01/25/23 12:21	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			01/25/23 12:21	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			01/25/23 12:21	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			01/25/23 12:21	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			01/25/23 12:21	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			01/25/23 12:21	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			01/25/23 12:21	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			01/25/23 12:21	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			01/25/23 12:21	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			01/25/23 12:21	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			01/25/23 12:21	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			01/25/23 12:21	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			01/25/23 12:21	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			01/25/23 12:21	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			01/25/23 12:21	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			01/25/23 12:21	1
Naphthalene	0.786	J	1.0	0.34	ug/L			01/25/23 12:21	1
n-Butylbenzene	0.658	J	1.0	0.39	ug/L			01/25/23 12:21	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			01/25/23 12:21	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			01/25/23 12:21	1
sec-Butylbenzene	0.660	J	1.0	0.40	ug/L			01/25/23 12:21	1
Styrene	<0.39		1.0	0.39	ug/L			01/25/23 12:21	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			01/25/23 12:21	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			01/25/23 12:21	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			01/25/23 12:21	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 500-695530/7
Matrix: Water
Analysis Batch: 695530

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	<0.37		1.0	0.37	ug/L			01/25/23 12:21	1
Tetrahydrofuran	<1.9		10	1.9	ug/L			01/25/23 12:21	1
Toluene	<0.15		0.50	0.15	ug/L			01/25/23 12:21	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			01/25/23 12:21	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			01/25/23 12:21	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			01/25/23 12:21	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			01/25/23 12:21	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			01/25/23 12:21	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			01/25/23 12:21	1
Trichloroethene	<0.16		0.50	0.16	ug/L			01/25/23 12:21	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			01/25/23 12:21	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			01/25/23 12:21	1
1,2,4-Trimethylbenzene	0.738	J	1.0	0.36	ug/L			01/25/23 12:21	1
1,3,5-Trimethylbenzene	0.781	J	1.0	0.25	ug/L			01/25/23 12:21	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			01/25/23 12:21	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			01/25/23 12:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*72 - 124*		*01/25/23 12:21*	*1*
Dibromofluoromethane (Surr)	*97*		*75 - 120*		*01/25/23 12:21*	*1*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 126*		*01/25/23 12:21*	*1*
Toluene-d8 (Surr)	*95*		*75 - 120*		*01/25/23 12:21*	*1*

Lab Sample ID: LCS 500-695530/5
Matrix: Water
Analysis Batch: 695530

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	40.0	34.6		ug/L		86	40 - 143
Benzene	40.0	42.2		ug/L		105	70 - 120
Bromobenzene	40.0	48.4		ug/L		121	70 - 122
Bromochloromethane	40.0	40.9		ug/L		102	65 - 122
Bromodichloromethane	40.0	41.5		ug/L		104	69 - 120
Bromoform	40.0	40.9		ug/L		102	56 - 132
Bromomethane	40.0	33.7		ug/L		84	40 - 152
2-Butanone (MEK)	40.0	35.1		ug/L		88	46 - 144
Carbon disulfide	40.0	35.6		ug/L		89	66 - 120
Carbon tetrachloride	40.0	35.5		ug/L		89	59 - 133
Chlorobenzene	40.0	43.5		ug/L		109	70 - 120
Chloroethane	40.0	38.8		ug/L		97	48 - 136
Chloroform	40.0	38.1		ug/L		95	70 - 120
Chloromethane	40.0	41.4		ug/L		103	56 - 152
2-Chlorotoluene	40.0	46.3		ug/L		116	70 - 125
4-Chlorotoluene	40.0	46.4		ug/L		116	68 - 124
cis-1,2-Dichloroethene	40.0	42.8		ug/L		107	70 - 125
cis-1,3-Dichloropropene	40.0	38.6		ug/L		96	64 - 127
Dibromochloromethane	40.0	41.8		ug/L		104	68 - 125
1,2-Dibromo-3-Chloropropane	40.0	36.3		ug/L		91	56 - 123

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-695530/5
Matrix: Water
Analysis Batch: 695530

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2-Dibromoethane	40.0	41.9		ug/L		105	70 - 125
Dibromomethane	40.0	39.1		ug/L		98	70 - 120
1,2-Dichlorobenzene	40.0	42.9		ug/L		107	70 - 125
1,3-Dichlorobenzene	40.0	44.3		ug/L		111	70 - 125
1,4-Dichlorobenzene	40.0	42.9		ug/L		107	70 - 120
Dichlorodifluoromethane	40.0	34.4		ug/L		86	40 - 159
1,1-Dichloroethane	40.0	43.3		ug/L		108	70 - 125
1,2-Dichloroethane	40.0	45.8		ug/L		114	68 - 127
1,1-Dichloroethene	40.0	39.1		ug/L		98	67 - 122
1,2-Dichloropropane	40.0	45.8		ug/L		114	67 - 130
1,3-Dichloropropane	40.0	43.1		ug/L		108	62 - 136
2,2-Dichloropropane	40.0	39.0		ug/L		98	58 - 139
1,1-Dichloropropene	40.0	40.8		ug/L		102	70 - 121
Ethylbenzene	40.0	43.7		ug/L		109	70 - 123
Hexachlorobutadiene	40.0	38.8		ug/L		97	51 - 150
Isopropylbenzene	40.0	39.9		ug/L		100	70 - 126
Methylene Chloride	40.0	39.1		ug/L		98	69 - 125
Methyl tert-butyl ether	40.0	38.2		ug/L		96	55 - 123
Naphthalene	40.0	32.3		ug/L		81	53 - 144
n-Butylbenzene	40.0	36.7		ug/L		92	68 - 125
N-Propylbenzene	40.0	40.6		ug/L		101	69 - 127
p-Isopropyltoluene	40.0	37.1		ug/L		93	70 - 125
sec-Butylbenzene	40.0	38.0		ug/L		95	70 - 123
Styrene	40.0	37.4		ug/L		94	70 - 120
tert-Butylbenzene	40.0	38.2		ug/L		95	70 - 121
1,1,1,2-Tetrachloroethane	40.0	41.1		ug/L		103	70 - 125
1,1,2,2-Tetrachloroethane	40.0	43.6		ug/L		109	62 - 140
Tetrachloroethene	40.0	44.0		ug/L		110	70 - 128
Tetrahydrofuran	80.0	72.0		ug/L		90	59 - 139
Toluene	40.0	43.9		ug/L		110	70 - 125
trans-1,2-Dichloroethene	40.0	41.6		ug/L		104	70 - 125
trans-1,3-Dichloropropene	40.0	38.3		ug/L		96	62 - 128
1,2,3-Trichlorobenzene	40.0	38.5		ug/L		96	51 - 145
1,2,4-Trichlorobenzene	40.0	39.2		ug/L		98	57 - 137
1,1,1-Trichloroethane	40.0	39.3		ug/L		98	70 - 125
1,1,2-Trichloroethane	40.0	45.1		ug/L		113	71 - 130
Trichloroethene	40.0	41.8		ug/L		105	70 - 125
Trichlorofluoromethane	40.0	33.0		ug/L		83	55 - 128
1,2,3-Trichloropropane	40.0	41.0		ug/L		103	50 - 133
1,2,4-Trimethylbenzene	40.0	39.5		ug/L		99	70 - 123
1,3,5-Trimethylbenzene	40.0	38.7		ug/L		97	70 - 123
Vinyl chloride	40.0	43.4		ug/L		108	64 - 126
Xylenes, Total	80.0	81.5		ug/L		102	70 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*101*		*72 - 124*
Dibromofluoromethane (Surr)	*87*		*75 - 120*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 126*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-695530/5
Matrix: Water
Analysis Batch: 695530

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	98		75 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 500-695558/1-A
Matrix: Water
Analysis Batch: 696005

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 695558

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		01/25/23 08:45	01/26/23 17:04	1
Cadmium	<0.17		0.50	0.17	ug/L		01/25/23 08:45	01/26/23 17:04	1
Chromium	<1.1		5.0	1.1	ug/L		01/25/23 08:45	01/26/23 17:04	1
Lead	<0.19		0.50	0.19	ug/L		01/25/23 08:45	01/26/23 17:04	1
Manganese	<0.79		2.5	0.79	ug/L		01/25/23 08:45	01/26/23 17:04	1
Selenium	<0.98		2.5	0.98	ug/L		01/25/23 08:45	01/26/23 17:04	1
Silver	<0.12		0.50	0.12	ug/L		01/25/23 08:45	01/26/23 17:04	1
Zinc	<6.9		20.0	6.9	ug/L		01/25/23 08:45	01/26/23 17:04	1

Lab Sample ID: MB 500-695558/1-A
Matrix: Water
Analysis Batch: 696481

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 695558

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<0.73		2.5	0.73	ug/L		01/25/23 08:45	01/30/23 20:08	1

Lab Sample ID: MB 500-695558/1-A
Matrix: Water
Analysis Batch: 697312

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 695558

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Boron	39.18	J	50.0	12.7	ug/L		01/25/23 08:45	02/01/23 19:10	1
Copper	0.902	J ^	2.0	0.50	ug/L		01/25/23 08:45	02/01/23 19:10	1

Lab Sample ID: LCS 500-695558/2-A
Matrix: Water
Analysis Batch: 696005

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 695558

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	97.52		ug/L		98	80 - 120
Cadmium	50.0	51.89		ug/L		104	80 - 120
Chromium	200	208.7		ug/L		104	80 - 120
Lead	100	100.7		ug/L		101	80 - 120
Manganese	500	522.8		ug/L		105	80 - 120
Selenium	100	99.67		ug/L		100	80 - 120
Silver	50.0	50.42		ug/L		101	80 - 120
Zinc	500	505.8		ug/L		101	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 500-695558/2-A
Matrix: Water
Analysis Batch: 696481

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 695558

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	500	524.1		ug/L		105	80 - 120

Lab Sample ID: LCS 500-695558/2-A
Matrix: Water
Analysis Batch: 697312

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 695558

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	1000	973.2		ug/L		97	80 - 120
Copper	250	263.5	^	ug/L		105	80 - 120

Lab Sample ID: MB 500-695780/1-A
Matrix: Water
Analysis Batch: 696005

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 695780

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		01/26/23 08:58	01/26/23 17:21	1
Arsenic	<0.23		1.0	0.23	ug/L		01/26/23 08:58	01/26/23 17:21	1
Beryllium	<0.53		1.0	0.53	ug/L		01/26/23 08:58	01/26/23 17:21	1
Cadmium	<0.17		0.50	0.17	ug/L		01/26/23 08:58	01/26/23 17:21	1
Chromium	<1.1		5.0	1.1	ug/L		01/26/23 08:58	01/26/23 17:21	1
Cobalt	<0.40		1.0	0.40	ug/L		01/26/23 08:58	01/26/23 17:21	1
Lead	<0.19		0.50	0.19	ug/L		01/26/23 08:58	01/26/23 17:21	1
Manganese	<0.79		2.5	0.79	ug/L		01/26/23 08:58	01/26/23 17:21	1
Nickel	<0.63		2.0	0.63	ug/L		01/26/23 08:58	01/26/23 17:21	1
Selenium	<0.98		2.5	0.98	ug/L		01/26/23 08:58	01/26/23 17:21	1
Silver	<0.12		0.50	0.12	ug/L		01/26/23 08:58	01/26/23 17:21	1
Thallium	<0.57		2.0	0.57	ug/L		01/26/23 08:58	01/26/23 17:21	1
Vanadium	<2.2		5.0	2.2	ug/L		01/26/23 08:58	01/26/23 17:21	1
Zinc	<6.9		20.0	6.9	ug/L		01/26/23 08:58	01/26/23 17:21	1

Lab Sample ID: MB 500-695780/1-A
Matrix: Water
Analysis Batch: 696481

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 695780

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		01/26/23 08:58	01/30/23 19:34	1
Barium	<0.73		2.5	0.73	ug/L		01/26/23 08:58	01/30/23 19:34	1
Cobalt	<0.40		1.0	0.40	ug/L		01/26/23 08:58	01/30/23 19:34	1
Nickel	<0.63		2.0	0.63	ug/L		01/26/23 08:58	01/30/23 19:34	1
Thallium	<0.57		2.0	0.57	ug/L		01/26/23 08:58	01/30/23 19:34	1
Vanadium	<2.2		5.0	2.2	ug/L		01/26/23 08:58	01/30/23 19:34	1

Lab Sample ID: MB 500-695780/1-A
Matrix: Water
Analysis Batch: 697312

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 695780

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Boron	67.41		50.0	12.7	ug/L		01/26/23 08:58	02/01/23 19:20	1
Copper	0.505	J ^	2.0	0.50	ug/L		01/26/23 08:58	02/01/23 19:20	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 500-695780/2-A
Matrix: Water
Analysis Batch: 696005

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 695780

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	500	474.2		ug/L		95	80 - 120
Arsenic	100	94.11		ug/L		94	80 - 120
Beryllium	50.0	53.13		ug/L		106	80 - 120
Cadmium	50.0	50.15		ug/L		100	80 - 120
Chromium	200	196.3		ug/L		98	80 - 120
Cobalt	500	493.2		ug/L		99	80 - 120
Lead	100	99.22		ug/L		99	80 - 120
Manganese	500	491.0		ug/L		98	80 - 120
Nickel	500	504.6		ug/L		101	80 - 120
Selenium	100	94.66		ug/L		95	80 - 120
Silver	50.0	48.39		ug/L		97	80 - 120
Thallium	100	102.0		ug/L		102	80 - 120
Vanadium	500	485.4		ug/L		97	80 - 120
Zinc	500	487.8		ug/L		98	80 - 120

Lab Sample ID: LCS 500-695780/2-A
Matrix: Water
Analysis Batch: 696481

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 695780

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	500	506.9		ug/L		101	80 - 120
Barium	500	511.6		ug/L		102	80 - 120
Cobalt	500	497.4		ug/L		99	80 - 120
Nickel	500	505.6		ug/L		101	80 - 120
Thallium	100	106.2		ug/L		106	80 - 120
Vanadium	500	494.3		ug/L		99	80 - 120

Lab Sample ID: LCS 500-695780/2-A
Matrix: Water
Analysis Batch: 697312

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 695780

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	1000	1032		ug/L		103	80 - 120
Copper	250	256.9	^	ug/L		103	80 - 120

Lab Sample ID: 500-228520-2 MS
Matrix: Water
Analysis Batch: 696005

Client Sample ID: MW-16
Prep Type: Dissolved
Prep Batch: 695780

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<1.3		500	493.8		ug/L		99	75 - 125
Arsenic	<0.23		100	98.28		ug/L		98	75 - 125
Beryllium	<0.53		50.0	52.55		ug/L		105	75 - 125
Cadmium	<0.17		50.0	51.27		ug/L		103	75 - 125
Chromium	<1.1		200	207.9		ug/L		104	75 - 125
Cobalt	<0.40		500	516.4		ug/L		103	75 - 125
Lead	<0.19		100	102.4		ug/L		102	75 - 125
Manganese	4.4		500	515.5		ug/L		102	75 - 125
Nickel	<0.63		500	524.6		ug/L		105	75 - 125

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 500-228520-2 MS
Matrix: Water
Analysis Batch: 696005

Client Sample ID: MW-16
Prep Type: Dissolved
Prep Batch: 695780

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Selenium	<0.98		100	98.66		ug/L		99	75 - 125
Silver	<0.12		50.0	50.67		ug/L		101	75 - 125
Thallium	<0.57		100	105.1		ug/L		105	75 - 125
Vanadium	<2.2		500	519.9		ug/L		104	75 - 125
Zinc	<6.9		500	502.8		ug/L		101	75 - 125

Lab Sample ID: 500-228520-2 MS
Matrix: Water
Analysis Batch: 696481

Client Sample ID: MW-16
Prep Type: Dissolved
Prep Batch: 695780

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<1.3		500	512.2		ug/L		102	75 - 125
Barium	66.6		500	574.8		ug/L		102	75 - 125
Cobalt	<0.40		500	491.2		ug/L		98	75 - 125
Nickel	0.67	J	500	493.2		ug/L		99	75 - 125
Thallium	<0.57		100	108.3		ug/L		108	75 - 125
Vanadium	<2.2		500	500.2		ug/L		100	75 - 125

Lab Sample ID: 500-228520-2 MS
Matrix: Water
Analysis Batch: 697312

Client Sample ID: MW-16
Prep Type: Dissolved
Prep Batch: 695780

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<1.3		500	514.8		ug/L		103	75 - 125
Beryllium	<0.53		50.0	50.73		ug/L		101	75 - 125
Boron	45.0	J B	1000	967.5		ug/L		92	75 - 125
Cobalt	<0.40		500	481.8		ug/L		96	75 - 125
Nickel	0.78	J	500	488.6		ug/L		98	75 - 125
Thallium	<0.57		100	103.9		ug/L		104	75 - 125
Vanadium	<2.2		500	493.6		ug/L		99	75 - 125

Lab Sample ID: 500-228520-2 MSD
Matrix: Water
Analysis Batch: 696005

Client Sample ID: MW-16
Prep Type: Dissolved
Prep Batch: 695780

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	<1.3		500	491.2		ug/L		98	75 - 125	1	20
Arsenic	<0.23		100	97.98		ug/L		98	75 - 125	0	20
Beryllium	<0.53		50.0	58.54		ug/L		117	75 - 125	11	20
Cadmium	<0.17		50.0	50.31		ug/L		101	75 - 125	2	20
Chromium	<1.1		200	208.6		ug/L		104	75 - 125	0	20
Cobalt	<0.40		500	519.8		ug/L		104	75 - 125	1	20
Lead	<0.19		100	100.5		ug/L		101	75 - 125	2	20
Manganese	4.4		500	523.2		ug/L		104	75 - 125	1	20
Nickel	<0.63		500	524.9		ug/L		105	75 - 125	0	20
Selenium	<0.98		100	97.39		ug/L		97	75 - 125	1	20
Silver	<0.12		50.0	50.02		ug/L		100	75 - 125	1	20
Thallium	<0.57		100	103.2		ug/L		103	75 - 125	2	20
Vanadium	<2.2		500	524.8		ug/L		105	75 - 125	1	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 500-228520-2 MSD
Matrix: Water
Analysis Batch: 696005

Client Sample ID: MW-16
Prep Type: Dissolved
Prep Batch: 695780

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Zinc	<6.9		500	503.9		ug/L		101	75 - 125	0	20

Lab Sample ID: 500-228520-2 MSD
Matrix: Water
Analysis Batch: 696481

Client Sample ID: MW-16
Prep Type: Dissolved
Prep Batch: 695780

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	<1.3		500	513.7		ug/L		103	75 - 125	0	20
Barium	66.6		500	576.6		ug/L		102	75 - 125	0	20
Cobalt	<0.40		500	497.1		ug/L		99	75 - 125	1	20
Nickel	0.67	J	500	500.1		ug/L		100	75 - 125	1	20
Thallium	<0.57		100	110.0		ug/L		110	75 - 125	2	20
Vanadium	<2.2		500	506.8		ug/L		101	75 - 125	1	20

Lab Sample ID: 500-228520-2 MSD
Matrix: Water
Analysis Batch: 697312

Client Sample ID: MW-16
Prep Type: Dissolved
Prep Batch: 695780

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	<1.3		500	514.8		ug/L		103	75 - 125	0	20
Beryllium	<0.53		50.0	52.22		ug/L		104	75 - 125	3	20
Boron	45.0	J B	1000	984.2		ug/L		94	75 - 125	2	20
Cobalt	<0.40		500	484.7		ug/L		97	75 - 125	1	20
Nickel	0.78	J	500	492.1		ug/L		98	75 - 125	1	20
Thallium	<0.57		100	102.2		ug/L		102	75 - 125	2	20
Vanadium	<2.2		500	498.4		ug/L		100	75 - 125	1	20

Lab Sample ID: 500-228520-2 DU
Matrix: Water
Analysis Batch: 696005

Client Sample ID: MW-16
Prep Type: Dissolved
Prep Batch: 695780

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Antimony	<1.3			<1.3		ug/L				NC	20
Arsenic	<0.23			<0.23		ug/L				NC	20
Beryllium	<0.53			<0.53		ug/L				NC	20
Cadmium	<0.17			<0.17		ug/L				NC	20
Chromium	<1.1			<1.1		ug/L				NC	20
Cobalt	<0.40			<0.40		ug/L				NC	20
Lead	<0.19			<0.19		ug/L				NC	20
Manganese	4.4			4.09		ug/L				6	20
Nickel	<0.63			<0.63		ug/L				NC	20
Selenium	<0.98			<0.98		ug/L				NC	20
Silver	<0.12			<0.12		ug/L				NC	20
Thallium	<0.57			<0.57		ug/L				NC	20
Vanadium	<2.2			<2.2		ug/L				NC	20
Zinc	<6.9			<6.9		ug/L				NC	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 500-228520-2 DU
Matrix: Water
Analysis Batch: 696481

Client Sample ID: MW-16
Prep Type: Dissolved
Prep Batch: 695780

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Antimony	<1.3			<1.3		ug/L				NC	20
Barium	66.6			65.32		ug/L				2	20
Cobalt	<0.40			<0.40		ug/L				NC	20
Nickel	0.67	J		<0.63		ug/L				NC	20
Thallium	<0.57			<0.57		ug/L				NC	20
Vanadium	<2.2			<2.2		ug/L				NC	20

Lab Sample ID: 500-228520-2 DU
Matrix: Water
Analysis Batch: 697312

Client Sample ID: MW-16
Prep Type: Dissolved
Prep Batch: 695780

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Antimony	<1.3			<1.3		ug/L				NC	20
Beryllium	<0.53			<0.53		ug/L				NC	20
Boron	45.0	J B		46.05	J	ug/L				2	20
Cobalt	<0.40			<0.40		ug/L				NC	20
Nickel	0.78	J		0.680	J	ug/L				13	20
Thallium	<0.57			<0.57		ug/L				NC	20
Vanadium	<2.2			<2.2		ug/L				NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-695914/12-A
Matrix: Water
Analysis Batch: 696041

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 695914

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0860	J	0.20	0.079	ug/L		01/26/23 15:55	01/27/23 07:44	1

Lab Sample ID: LCS 500-695914/13-A
Matrix: Water
Analysis Batch: 696041

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 695914

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury			1.98	1.94		ug/L		98	80 - 120		

Lab Sample ID: 500-228520-1 MS
Matrix: Water
Analysis Batch: 696041

Client Sample ID: MW-14WT
Prep Type: Dissolved
Prep Batch: 695914

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury	<0.079	F2	1.00	0.945		ug/L		95	75 - 125		

Lab Sample ID: 500-228520-1 MSD
Matrix: Water
Analysis Batch: 696041

Client Sample ID: MW-14WT
Prep Type: Dissolved
Prep Batch: 695914

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	<0.079	F2	1.00	1.19	F2	ug/L		119	75 - 125	23	20

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 500-228520-1 DU
Matrix: Water
Analysis Batch: 696041

Client Sample ID: MW-14WT
Prep Type: Dissolved
Prep Batch: 695914

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	<0.079	F2	<0.079		ug/L		NC	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-695991/3
Matrix: Water
Analysis Batch: 695991

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.17		0.20	0.17	mg/L			01/26/23 17:16	1
Fluoride	<0.067		0.20	0.067	mg/L			01/26/23 17:16	1
Sulfate	<0.095		0.20	0.095	mg/L			01/26/23 17:16	1

Lab Sample ID: LCS 500-695991/4
Matrix: Water
Analysis Batch: 695991

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	3.00	2.95		mg/L		98	90 - 110
Fluoride	1.00	1.09		mg/L		109	90 - 110
Sulfate	5.00	5.14		mg/L		103	90 - 110

Lab Sample ID: MB 500-696145/11
Matrix: Water
Analysis Batch: 696145

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.067		0.20	0.067	mg/L			01/28/23 14:05	1

Lab Sample ID: LCS 500-696145/12
Matrix: Water
Analysis Batch: 696145

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	1.00	1.01		mg/L		101	90 - 110

Method: N07-0003 - Enzymatic Nitrate-Nitrite Nitrogen

Lab Sample ID: MB 500-696282/13
Matrix: Water
Analysis Batch: 696282

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	<0.041		0.10	0.041	mg/L			01/30/23 08:57	1

Method: N07-0003 - Enzymatic Nitrate-Nitrite Nitrogen (Continued)

Lab Sample ID: LCS 500-696282/14
Matrix: Water
Analysis Batch: 696282

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate Nitrite as N			1.00	0.987		mg/L		99	90 - 110		

Lab Sample ID: 500-228520-2 MS
Matrix: Water
Analysis Batch: 696282

Client Sample ID: MW-16
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate Nitrite as N	1.1		1.00	2.07		mg/L		94	90 - 110		

Lab Sample ID: 500-228520-2 MSD
Matrix: Water
Analysis Batch: 696282

Client Sample ID: MW-16
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate Nitrite as N	1.1		1.00	2.08		mg/L		95	90 - 110	1	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-695886/3
Matrix: Water
Analysis Batch: 695886

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			01/26/23 08:56	1

Lab Sample ID: LCS 500-695886/4
Matrix: Water
Analysis Batch: 695886

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Alkalinity			100	98.70		mg/L		99	90 - 110		

Lab Sample ID: MB 500-696554/3
Matrix: Water
Analysis Batch: 696554

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			01/31/23 12:00	1

Lab Sample ID: LCS 500-696554/4
Matrix: Water
Analysis Batch: 696554

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Alkalinity			100	99.23		mg/L		99	90 - 110		

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: 500-228520-2 DU
Matrix: Water
Analysis Batch: 695886

Client Sample ID: MW-16
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity	357			370.0		mg/L				4	20

Lab Chronicle

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-228520-1

Client Sample ID: MW-14WT
Date Collected: 01/23/23 08:00
Date Received: 01/24/23 09:30

Lab Sample ID: 500-228520-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	695530	W1T	EET CHI	01/25/23 14:59
Dissolved	Prep	3005A			695558	BDE	EET CHI	01/25/23 08:45 - 01/25/23 09:15 [1]
Dissolved	Analysis	6020B		1	697312	FXG	EET CHI	02/01/23 19:17
Dissolved	Prep	3005A			695558	BDE	EET CHI	01/25/23 08:45 - 01/25/23 09:15 [1]
Dissolved	Analysis	6020B		1	696005	FXG	EET CHI	01/26/23 17:10
Dissolved	Prep	3005A			695558	BDE	EET CHI	01/25/23 08:45 - 01/25/23 09:15 [1]
Dissolved	Analysis	6020B		1	696481	FXG	EET CHI	01/30/23 20:15
Dissolved	Prep	7470A			695914	MJG	EET CHI	01/26/23 15:55 - 01/26/23 17:55 [1]
Dissolved	Analysis	7470A		1	696041	MJG	EET CHI	01/27/23 07:57
Dissolved	Prep	3005A			695558	BDE	EET CHI	01/25/23 08:45 - 01/25/23 09:15 [1]
Dissolved	Analysis	SM 2340B		1	696526	FXG	EET CHI	01/31/23 13:13
Dissolved	Analysis	300.0		1	695991	MM	EET CHI	01/26/23 18:45
Dissolved	Analysis	N07-0003		1	696282	LP	EET CHI	01/30/23 09:00
Dissolved	Analysis	SM 2320B		1	695886	EH	EET CHI	01/26/23 12:08

Client Sample ID: MW-16
Date Collected: 01/23/23 09:00
Date Received: 01/24/23 09:30

Lab Sample ID: 500-228520-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	695530	W1T	EET CHI	01/25/23 15:25
Dissolved	Prep	3005A			695780	BDE	EET CHI	01/26/23 08:58 - 01/26/23 09:28 [1]
Dissolved	Analysis	6020B		1	697312	FXG	EET CHI	02/01/23 19:27
Dissolved	Prep	3005A			695780	BDE	EET CHI	01/26/23 08:58 - 01/26/23 09:28 [1]
Dissolved	Analysis	6020B		1	696005	FXG	EET CHI	01/26/23 17:28
Dissolved	Prep	3005A			695780	BDE	EET CHI	01/26/23 08:58 - 01/26/23 09:28 [1]
Dissolved	Analysis	6020B		1	696481	FXG	EET CHI	01/30/23 19:48
Dissolved	Prep	7470A			695914	MJG	EET CHI	01/26/23 15:55 - 01/26/23 17:55 [1]
Dissolved	Analysis	7470A		1	696041	MJG	EET CHI	01/27/23 08:25
Dissolved	Prep	3005A			695558	BDE	EET CHI	01/25/23 08:45 - 01/25/23 09:15 [1]
Dissolved	Analysis	SM 2340B		1	696526	FXG	EET CHI	01/31/23 13:13
Dissolved	Analysis	300.0		2	695991	MM	EET CHI	01/26/23 18:58
Dissolved	Analysis	300.0		1	696145	RES	EET CHI	01/28/23 12:49
Dissolved	Analysis	N07-0003		1	696282	LP	EET CHI	01/30/23 08:58
Dissolved	Analysis	SM 2320B		1	695886	EH	EET CHI	01/26/23 12:16

Client Sample ID: MW-17WT
Date Collected: 01/23/23 11:00
Date Received: 01/24/23 09:30

Lab Sample ID: 500-228520-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	695530	W1T	EET CHI	01/25/23 15:52
Dissolved	Prep	3005A			695780	BDE	EET CHI	01/26/23 08:58 - 01/26/23 09:28 [1]
Dissolved	Analysis	6020B		1	697312	FXG	EET CHI	02/01/23 19:52

Lab Chronicle

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-228520-1

Client Sample ID: MW-17WT

Lab Sample ID: 500-228520-3

Date Collected: 01/23/23 11:00

Matrix: Water

Date Received: 01/24/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			695780	BDE	EET CHI	01/26/23 08:58 - 01/26/23 09:28 [1]
Dissolved	Analysis	6020B		1	696005	FXG	EET CHI	01/26/23 17:52
Dissolved	Prep	3005A			695780	BDE	EET CHI	01/26/23 08:58 - 01/26/23 09:28 [1]
Dissolved	Analysis	6020B		1	696481	FXG	EET CHI	01/30/23 20:05
Dissolved	Prep	7470A			695914	MJG	EET CHI	01/26/23 15:55 - 01/26/23 17:55 [1]
Dissolved	Analysis	7470A		1	696041	MJG	EET CHI	01/27/23 08:27
Dissolved	Prep	3005A			695558	BDE	EET CHI	01/25/23 08:45 - 01/25/23 09:15 [1]
Dissolved	Analysis	SM 2340B		1	696526	FXG	EET CHI	01/31/23 13:13
Dissolved	Analysis	300.0		2	695991	MM	EET CHI	01/26/23 19:11
Dissolved	Analysis	300.0		1	696145	RES	EET CHI	01/28/23 12:37
Dissolved	Analysis	N07-0003		1	696282	LP	EET CHI	01/30/23 09:00
Dissolved	Analysis	SM 2320B		1	696554	EH	EET CHI	01/31/23 12:14

Client Sample ID: Trip Blank-VOC

Lab Sample ID: 500-228520-4

Date Collected: 01/23/23 00:00

Matrix: Water

Date Received: 01/24/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	695530	W1T	EET CHI	01/25/23 14:07

[1] Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-228520-1
Project/Site: Vernon County Landfill Expansion

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999580010	08-31-23

Eurofins Chicago Please Foward
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211 Copy of Report to Veronica Aranda: varanda@sehinc.com

Chain of Custody Record

eurofins | Environment Testing America

500-228520 COC

Client Information	Sampler: Veronica Aranda, SEH Inc	Lab PM: Fredrick Sandie	Carrier:	COC No: [redacted]
Client Contact: Stacie Sanborn	Phone: 715-933-2351	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State:	Page: Page 1 of 1
Company: Vernon County Solid Waste & Recycling	PWSID:	Analysis Requested		Job #: 500-228520

Address	Due Date Requested	
City	TAT Requested (days)	
State Zip	Compliance Project: Δ Yes Δ No	
Phone	PO #:	
Email	WO #:	
Project Name	Project #: 50020572	
Site	SSOW#:	

Preservation Codes

A	HCL	M	Hexane
B	NaOH	N	None
C	Zn Acetate	O	AsNaO2
D	Nitric Acid	P	Na2O4S
E	NaHSO4	Q	Na2SO3
F	MeOH	R	Na2S2O3
G	Amchlor	S	H2SO4
H	Ascorbic Acid	T	TSP Dodecahydrate
I	Ice	U	Acetone
J	DI Water	V	MCAA
K	EDTA	W	pH 4-5
L	EDA	Y	Trizma
		Z	other (specify)

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SM2340B Hardness Diss. (Field Filtered)	2320B - Alk Diss (Field Filtered)	300 Chloride Diss (Field Filtered)	8260B VOC	6020A Cu/Mn/Zn Diss (Field Filtered)	300 Sulfate	6020A, 7470A (Field Filtered) [As, Ba, Cd Cr Pb, Hg Se B, Ag]	300 Flouride	353.2 - N+N	6020A Sb/Be/Co/Ni/Ti/V Diss (Field Filtered)					Total Number of containers	Special Instructions/Note
				Preservation Code:																			
1	MW-14WT	1/23/23	8:00	G	Water			X	X	X	X	X	X	X	X	X							
2	MW-11D	1/23/23	9 00	G	Water			X	X	X	X	X	X	X	X	X	X						
3	MW-17WT	1/23/23	11 00	G	Water			X	X	X	X	X	X	X	X	X							
					Water																		
					Water																		
4	trip blank-VOC				Water																		
					Water																		
					Water																		
					Water																		
					Water																		
					Water																		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment: cooler ice

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	[signature]	1/23/2023	SEH Inc.	Stephanie Hernandez	1/24/23 0930	EETA
	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact.	Custody Seal No	Cooler Temperature(s) °C and Other Remarks
Yes Δ No	2110904	-0.3+-0.5

Ver 01/16/2019

	MW-14WT	MW-16	MW-17WT
Baseline/Detection			
Alkalinity	x	x	x
Chloride	x	x	x
Hardness	x	x	x
Field Cond (FIELD)	x	x	x
pH (FIELD)	x	x	x
Temp (FIELD)	x	x	x
Public Welfare			
Copper	x	x	x
Manganese	x	x	x
Sulfate	x	x	x
Zinc	x	x	x
Public Health			
Arsenic	x	x	x
Barium	x	x	x
Cadmium	x	x	x
Chromium	x	x	x
Flouride	x	x	x
Lead	x	x	x
Mercury	x	x	x
N+N	x	x	x
Selenium	x	x	x
Silver	x	x	x
Boron	x	x	x
Subtitle D Well Background			
Antimony			x
Beryllium			x
Cobalt			x
Nickel			x
Thalium			x
Vanadium			x
VOCs (8260)	x	x	x

Sandra Fredrick

From: Brian Kent <bkent@sehinc.com>
Sent: Tuesday, January 24, 2023 3:27 PM
To: Sandra Fredrick; Stacie Sanborn; Veronica Aranda
Subject: RE: Eurofins Chicago Sample Login Confirmation files from 500-228520 Vernon County Landfill Expansion
Attachments: Baseline Sampling Requirements_Jan 23.xlsx

EXTERNAL EMAIL*

Sandie- please see attached spreadsheet with a summary of required parameters for each well. It appears that Veronica had requested that MW-16 have the extended subtitle D baseline parameters. NOTE it should be MW-17WT with the extended metals list per the attached spreadsheet. Please correct. Also, please note the VOC8260 list will likely need to be expanded to include the parameters listed below. Also, please confirm the metals (6020B) is the method with lower detection limit. We need to make sure the LOD/LOQ are above the applicable water standards. Thanks.

APPENDIX III

VOLATILE ORGANIC COMPOUNDS FOR DETECTION MONITORING[1] AT MUNICIPAL SOLID WASTE LANDFILLS

Common name[2]	CAS RN[3]	Synonyms
Acetone[1]	67–64–1	2–Propanone
Benzene	71–43–2	
Bromodichloromethane	75–27–4	Dichlorobromomethane
Bromoform	75–25–2	Tribromomethane
Carbon disulfide[1]	75–15–0	
Carbon tetrachloride	56–23–5	Tetrachloromethane
Chlorobenzene	108–90–7	Monochlorobenzene
Chloroethane	75–00–3	Ethyl chloride
Chloroform	67–66–3	Trichloromethane
Dibromochloromethane	124–48–1	Chlorodibromomethane
1,2–Dibromo–3–chloropropane	96–12–8	DBCP
1,2–Dibromoethane	106–93–4	EDB; Ethylene dibromide
o–Dichlorobenzene	95–50–1	1,2–Dichlorobenzene
m–Dichlorobenzene	541–73–1	1,3–Dichlorobenzene
p–Dichlorobenzene	106–46–7	1,4–Dichlorobenzene
Dichlorodifluoromethane	75–71–8	Freon 12, Difluorodichloromethane
1,1–Dichloroethane	75–34–3	
1,2–Dichloroethane	107–06–2	Ethylene dichloride
1,1–Dichloroethylene	75–35–4	Vinylidene chloride
cis–1,2–Dichloroethylene	156–59–2	cis–1,2–Dichloroethene
trans–1,2–Dichloroethylene	156–60–5	trans–1,2–Dichloroethene
1,2–Dichloropropane	78–87–5	
cis–1,3–Dichloropropylene	10061–01–5	cis–1,3–Dichloropropene, Z–Dichloropropylene
trans–1,3–Dichloropropylene	10061–02–6	trans–1,3–Dichloropropene, E–Dichloropropylene
Ethylbenzene	100–41–4	
Methyl bromide	74–83–9	Bromomethane
Methyl chloride	74–87–3	Chloromethane
Methylene bromide	74–95–3	Dibromomethane
Methylene chloride	75–09–2	Dichloromethane
Methyl ethyl ketone[1]	78–93–3	2–Butanone; MEK
Methyl tert–butyl ether	1634–04–4	MTBE
Naphthalene	91–20–3	
Styrene	100–42–5	Ethenylbenzene
Tetrachloroethylene	127–18–4	Perchloroethylene; Tetrachloroethene; PCE

Common name[2]	CAS RN[3]	Synonyms
Tetrahydrofuran[1]	109–99–9	THF
Toluene	108–88–3	Methylbenzene
1,1,1–Trichloroethane	71–55–6	Methylchloroform
1,1,2–Trichloroethane	79–00–5	
Trichloroethylene	79–01–6	Trichloroethene; TCE
Trichlorofluoromethane	75–69–4	Fluorotrichloromethane, Freon 11
Vinyl chloride	75–01–4	Chloroethene
Xylene (total) [see note 4]	1330–20–7	Dimethylbenzene

1 Includes the individual Volatile Organic Compounds (VOCs) necessary when a VOC scan is required under ch. NR 507. Acetone, Carbon disulfide, Methylethyl ketone, and Tetrahydrofuran are exempted if EPA Method 8021 is used for the analysis.

2 Common names are those widely used in government regulations, scientific publications and commerce; synonyms exist for many chemicals.

3 Chemical Abstracts Service registry number.

4 Xylene (total): This entry includes o–xylene (CAS RN 96–47–6), m–xylene (CAS RN 108–38–3), p–xylene (CAS RN 106–42–3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330–20–7).

Note: Wisconsin DNR GEMS parameter numbers for the substances listed in ch. NR 507 Appendix III can be found at http://www.dnr.wi.gov/org/aw/wm/monitor/.

Brian L. Kent, CHMM
Principal, Project Manager
Short Elliott Hendrickson Inc.
715.456.4621 mobile | 608.498.4844 direct

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From: Sandie Fredrick <Sandra.Fredrick@et.eurofinsus.com>
Sent: Tuesday, January 24, 2023 2:46 PM
To: Brian Kent <bkent@sehinc.com>; Stacie Sanborn <stacie.sanborn@vernoncounty.org>; Veronica Aranda <varanda@sehinc.com>
Subject: Eurofins Chicago Sample Login Confirmation files from 500-228520 Vernon County Landfill Expansion

Hello V - please definitely review this one - want to make sure we have what you need logged...

Some filtered - some not etc.

Thanks
Sandie

Attached, please find the Sample Confirmation files for job 500-228520; Vernon County Landfill Expansion

Please feel free to contact me if you have any questions.

Thank you.

Sandie Fredrick
Project Manager

Eurofins Chicago
Phone: 920-261-1660

E-mail: Sandra.Fredrick@et.eurofinsus.com
www.eurofinsus.com/env



Reference: [500-700451]
Attachments: 3

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ORIGIN ID:RRLA (715) 933-2351
VERONICA ARANDA
SHORT ELLIOT HENDRICKSON
10 NORTH BRIGDE ST.

CHIPPEWA FALLS, WI 54729
UNITED STATES US

SHIP DATE: 09DEC22
ACTWGT: 25.00 LB MAN
CAD: 0269688/CAFE3616

500-228520 Waybi

TO **SAMPLE RECEIPT**
EUROFINS
2417 BOND ST.

UNIVERSITY PARK IL 60484

(262) 202-5955 REF:
INV:
PO: DEPT:

RMA:

FedEx Express

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TRK# 0221 6155 6317 5270

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316109 23Jan2023 EAUA 581G2/D297/C0B8

48Q

Login Sample Receipt Checklist

Client: Vernon County Solid Waste & Recycling

Job Number: 500-228520-1

Login Number: 228520
List Number: 1
Creator: Hernandez, Stephanie

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	-0.5 Samples not frozen
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

ANALYTICAL REPORT

PREPARED FOR

Attn: Stacie Sanborn
Vernon County Solid Waste & Recycling
S3705 County Road LF
Viroqua, Wisconsin 54665

Generated 3/16/2023 5:05:34 PM

JOB DESCRIPTION

Vernon County Landfill Expansion

JOB NUMBER

500-230147-1

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

my EOL

Eurofins Chicago

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Authorization



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Authorized for release by
Jodie Bracken, Project Management Assistant II
Jodie.Bracken@et.eurofinsus.com
Designee for
Sandie Fredrick, Project Manager II
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

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Job ID: 500-230147-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-230147-1

Comments
No additional comments.

Receipt
The samples were received on 3/2/2023 10:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 5.4º C.

GC/MS VOA
Methods 624.1, 8260B: Methylene chloride was detected in the following items: Trip Blank (500-230147-3). Methylene chloride is a known lab contaminant; therefore all low level detects for this compound could be suspected as lab contamination.

Method 8260B: The laboratory control sample (LCS) for analytical batch 500-701394 recovered outside control limits for the following analytes: 1,1,1-Trichloroethane and Bromomethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.MW-14WT (500-230147-1), MW-16 (500-230147-2) and Trip Blank (500-230147-3)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Field Service / Mobile Lab
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method N07-0003: The prior continuing calibration verification (CCV) associated with batch 500-701264 recovered below the lower control limit at 89% recovery. The following continuing calibration verification (CCV) recovered within the acceptable control limit at 92% recovery. The associated Method Blank and Laboratory Control Sample were within control limits; therefore, the MB and LCS were qualified and reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-230147-1

Client Sample ID: MW-14WT — Lab Sample ID: 500-230147-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	2.6		1.0	0.23	ug/L	1		6020B	Dissolved
Barium	92.4		2.5	0.73	ug/L	1		6020B	Dissolved
Beryllium	0.86	J	1.0	0.53	ug/L	1		6020B	Dissolved
Cadmium	0.23	J B	0.50	0.17	ug/L	1		6020B	Dissolved
Chromium	16.5		5.0	1.1	ug/L	1		6020B	Dissolved
Cobalt	4.1		1.0	0.40	ug/L	1		6020B	Dissolved
Copper	14.9	B	2.0	0.50	ug/L	1		6020B	Dissolved
Lead	5.1	B	0.50	0.19	ug/L	1		6020B	Dissolved
Manganese	759		2.5	0.79	ug/L	1		6020B	Dissolved
Nickel	12.1		2.0	0.63	ug/L	1		6020B	Dissolved
Vanadium	27.8		5.0	2.2	ug/L	1		6020B	Dissolved
Zinc	25.6		20.0	6.9	ug/L	1		6020B	Dissolved
Hardness as calcium carbonate	227		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	4.4		1.0	0.12	mg/L	1		300.0	Dissolved
Fluoride	0.24	J	1.0	0.19	mg/L	1		300.0	Dissolved
Sulfate	3.2		1.0	0.21	mg/L	1		300.0	Dissolved
Nitrate Nitrite as N	0.28		0.10	0.041	mg/L	1		N07-0003	Dissolved
Alkalinity	222		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: MW-16 — Lab Sample ID: 500-230147-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Barium	63.3		2.5	0.73	ug/L	1		6020B	Dissolved
Boron	13.1	J	50.0	12.7	ug/L	1		6020B	Dissolved
Copper	1.1	J B	2.0	0.50	ug/L	1		6020B	Dissolved
Manganese	3.8		2.5	0.79	ug/L	1		6020B	Dissolved
Hardness as calcium carbonate	386		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	5.1		1.0	0.12	mg/L	1		300.0	Dissolved
Fluoride	0.22	J	1.0	0.19	mg/L	1		300.0	Dissolved
Sulfate	15.6		1.0	0.21	mg/L	1		300.0	Dissolved
Nitrate Nitrite as N	1.0		0.10	0.041	mg/L	1		N07-0003	Dissolved
Alkalinity	381		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: Trip Blank — Lab Sample ID: 500-230147-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Methylene Chloride	1.6	J	5.0	1.6	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-230147-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	EET CHI
6020B	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	EET CHI
300.0	Anions, Ion Chromatography	EPA	EET CHI
N07-0003	Enzymatic Nitrate-Nitrite Nitrogen	EPA	EET CHI
SM 2320B	Alkalinity	SM	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
5030B	Purge and Trap	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-230147-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-230147-1	MW-14WT	Water	03/01/23 08:00	03/02/23 10:30
500-230147-2	MW-16	Water	03/01/23 09:00	03/02/23 10:30
500-230147-3	Trip Blank	Water	03/01/23 00:00	03/02/23 10:30

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-230147-1

Client Sample ID: MW-14WT
Date Collected: 03/01/23 08:00
Date Received: 03/02/23 10:30

Lab Sample ID: 500-230147-1
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			03/07/23 16:19	1
Bromobenzene	<0.36		1.0	0.36	ug/L			03/07/23 16:19	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			03/07/23 16:19	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			03/07/23 16:19	1
Bromoform	<0.48		1.0	0.48	ug/L			03/07/23 16:19	1
Bromomethane	<0.80	*	3.0	0.80	ug/L			03/07/23 16:19	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			03/07/23 16:19	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			03/07/23 16:19	1
Chloroethane	<0.51		1.0	0.51	ug/L			03/07/23 16:19	1
Chloroform	<0.37		2.0	0.37	ug/L			03/07/23 16:19	1
Chloromethane	<0.32		1.0	0.32	ug/L			03/07/23 16:19	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			03/07/23 16:19	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			03/07/23 16:19	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			03/07/23 16:19	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			03/07/23 16:19	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			03/07/23 16:19	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			03/07/23 16:19	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			03/07/23 16:19	1
Dibromomethane	<0.27		1.0	0.27	ug/L			03/07/23 16:19	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			03/07/23 16:19	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			03/07/23 16:19	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			03/07/23 16:19	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			03/07/23 16:19	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			03/07/23 16:19	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			03/07/23 16:19	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			03/07/23 16:19	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			03/07/23 16:19	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			03/07/23 16:19	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			03/07/23 16:19	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			03/07/23 16:19	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			03/07/23 16:19	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			03/07/23 16:19	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			03/07/23 16:19	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			03/07/23 16:19	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			03/07/23 16:19	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			03/07/23 16:19	1
Naphthalene	<0.34		1.0	0.34	ug/L			03/07/23 16:19	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			03/07/23 16:19	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			03/07/23 16:19	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			03/07/23 16:19	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			03/07/23 16:19	1
Styrene	<0.39		1.0	0.39	ug/L			03/07/23 16:19	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			03/07/23 16:19	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			03/07/23 16:19	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			03/07/23 16:19	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			03/07/23 16:19	1
Toluene	<0.15		0.50	0.15	ug/L			03/07/23 16:19	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			03/07/23 16:19	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			03/07/23 16:19	1

Client Sample ID: MW-14WT
Lab Sample ID: 500-230147-1

Date Collected: 03/01/23 08:00
Matrix: Water

Date Received: 03/02/23 10:30

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			03/07/23 16:19	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			03/07/23 16:19	1
1,1,1-Trichloroethane	<0.38	*	1.0	0.38	ug/L			03/07/23 16:19	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			03/07/23 16:19	1
Trichloroethene	<0.16		0.50	0.16	ug/L			03/07/23 16:19	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			03/07/23 16:19	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			03/07/23 16:19	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			03/07/23 16:19	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			03/07/23 16:19	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			03/07/23 16:19	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			03/07/23 16:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*72 - 124*		*03/07/23 16:19*	*1*
Dibromofluoromethane (Surr)	*106*		*75 - 120*		*03/07/23 16:19*	*1*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 126*		*03/07/23 16:19*	*1*
Toluene-d8 (Surr)	*86*		*75 - 120*		*03/07/23 16:19*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		03/06/23 15:41	03/07/23 19:20	1
Arsenic	**2.6**		1.0	0.23	ug/L		03/06/23 15:41	03/07/23 19:20	1
Barium	**92.4**		2.5	0.73	ug/L		03/06/23 15:41	03/07/23 19:20	1
Beryllium	**0.86**	**J**	1.0	0.53	ug/L		03/06/23 15:41	03/08/23 18:37	1
Boron	<12.7		50.0	12.7	ug/L		03/06/23 15:41	03/08/23 18:37	1
Cadmium	**0.23**	**J B**	0.50	0.17	ug/L		03/06/23 15:41	03/08/23 18:37	1
Chromium	**16.5**		5.0	1.1	ug/L		03/06/23 15:41	03/07/23 19:20	1
Cobalt	**4.1**		1.0	0.40	ug/L		03/06/23 15:41	03/07/23 19:20	1
Copper	**14.9**	**B**	2.0	0.50	ug/L		03/06/23 15:41	03/07/23 19:20	1
Lead	**5.1**	**B**	0.50	0.19	ug/L		03/06/23 15:41	03/08/23 18:37	1
Manganese	**759**		2.5	0.79	ug/L		03/06/23 15:41	03/07/23 19:20	1
Nickel	**12.1**		2.0	0.63	ug/L		03/06/23 15:41	03/07/23 19:20	1
Selenium	<0.98		2.5	0.98	ug/L		03/06/23 15:41	03/08/23 18:37	1
Silver	<0.12		0.50	0.12	ug/L		03/06/23 15:41	03/07/23 19:20	1
Thallium	<0.57		2.0	0.57	ug/L		03/06/23 15:41	03/07/23 19:20	1
Vanadium	**27.8**		5.0	2.2	ug/L		03/06/23 15:41	03/07/23 19:20	1
Zinc	**25.6**		20.0	6.9	ug/L		03/06/23 15:41	03/07/23 19:20	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.079		0.20	0.079	ug/L		03/07/23 11:05	03/08/23 10:44	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**227**		0.91	0.46	mg/L		03/06/23 15:41	03/09/23 10:06	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	**4.4**		1.0	0.12	mg/L			03/03/23 15:13	1
Fluoride (EPA 300.0)	**0.24**	**J**	1.0	0.19	mg/L			03/03/23 15:13	1
Sulfate (EPA 300.0)	**3.2**		1.0	0.21	mg/L			03/03/23 15:13	1

Client: Vernon County Solid Waste & Recycling
Job ID: 500-230147-1
Project/Site: Vernon County Landfill Expansion

Client Sample ID: MW-14WT
Lab Sample ID: 500-230147-1
Date Collected: 03/01/23 08:00
Matrix: Water
Date Received: 03/02/23 10:30

General Chemistry - Dissolved (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N (EPA N07-0003)	0.28		0.10	0.041	mg/L			03/06/23 10:20	1
Alkalinity (SM 2320B)	222		5.0	3.7	mg/L			03/07/23 15:23	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-230147-1

Client Sample ID: MW-16
Date Collected: 03/01/23 09:00
Date Received: 03/02/23 10:30

Lab Sample ID: 500-230147-2
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			03/07/23 16:43	1
Bromobenzene	<0.36		1.0	0.36	ug/L			03/07/23 16:43	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			03/07/23 16:43	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			03/07/23 16:43	1
Bromoform	<0.48		1.0	0.48	ug/L			03/07/23 16:43	1
Bromomethane	<0.80	*	3.0	0.80	ug/L			03/07/23 16:43	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			03/07/23 16:43	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			03/07/23 16:43	1
Chloroethane	<0.51		1.0	0.51	ug/L			03/07/23 16:43	1
Chloroform	<0.37		2.0	0.37	ug/L			03/07/23 16:43	1
Chloromethane	<0.32		1.0	0.32	ug/L			03/07/23 16:43	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			03/07/23 16:43	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			03/07/23 16:43	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			03/07/23 16:43	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			03/07/23 16:43	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			03/07/23 16:43	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			03/07/23 16:43	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			03/07/23 16:43	1
Dibromomethane	<0.27		1.0	0.27	ug/L			03/07/23 16:43	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			03/07/23 16:43	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			03/07/23 16:43	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			03/07/23 16:43	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			03/07/23 16:43	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			03/07/23 16:43	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			03/07/23 16:43	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			03/07/23 16:43	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			03/07/23 16:43	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			03/07/23 16:43	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			03/07/23 16:43	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			03/07/23 16:43	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			03/07/23 16:43	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			03/07/23 16:43	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			03/07/23 16:43	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			03/07/23 16:43	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			03/07/23 16:43	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			03/07/23 16:43	1
Naphthalene	<0.34		1.0	0.34	ug/L			03/07/23 16:43	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			03/07/23 16:43	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			03/07/23 16:43	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			03/07/23 16:43	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			03/07/23 16:43	1
Styrene	<0.39		1.0	0.39	ug/L			03/07/23 16:43	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			03/07/23 16:43	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			03/07/23 16:43	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			03/07/23 16:43	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			03/07/23 16:43	1
Toluene	<0.15		0.50	0.15	ug/L			03/07/23 16:43	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			03/07/23 16:43	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			03/07/23 16:43	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-230147-1

Client Sample ID: MW-16
Date Collected: 03/01/23 09:00
Date Received: 03/02/23 10:30

Lab Sample ID: 500-230147-2
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			03/07/23 16:43	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			03/07/23 16:43	1
1,1,1-Trichloroethane	<0.38	*	1.0	0.38	ug/L			03/07/23 16:43	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			03/07/23 16:43	1
Trichloroethene	<0.16		0.50	0.16	ug/L			03/07/23 16:43	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			03/07/23 16:43	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			03/07/23 16:43	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			03/07/23 16:43	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			03/07/23 16:43	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			03/07/23 16:43	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			03/07/23 16:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*72 - 124*		*03/07/23 16:43*	*1*
Dibromofluoromethane (Surr)	*104*		*75 - 120*		*03/07/23 16:43*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 126*		*03/07/23 16:43*	*1*
Toluene-d8 (Surr)	*86*		*75 - 120*		*03/07/23 16:43*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		03/06/23 15:41	03/07/23 19:23	1
Arsenic	<0.23		1.0	0.23	ug/L		03/06/23 15:41	03/07/23 19:23	1
Barium	**63.3**		2.5	0.73	ug/L		03/06/23 15:41	03/07/23 19:23	1
Beryllium	<0.53		1.0	0.53	ug/L		03/06/23 15:41	03/08/23 18:41	1
Boron	**13.1**	**J**	50.0	12.7	ug/L		03/06/23 15:41	03/08/23 18:41	1
Cadmium	<0.17		0.50	0.17	ug/L		03/06/23 15:41	03/08/23 18:41	1
Chromium	<1.1		5.0	1.1	ug/L		03/06/23 15:41	03/07/23 19:23	1
Cobalt	<0.40		1.0	0.40	ug/L		03/06/23 15:41	03/07/23 19:23	1
Copper	**1.1**	**J B**	2.0	0.50	ug/L		03/06/23 15:41	03/07/23 19:23	1
Lead	<0.19		0.50	0.19	ug/L		03/06/23 15:41	03/08/23 18:41	1
Manganese	**3.8**		2.5	0.79	ug/L		03/06/23 15:41	03/07/23 19:23	1
Nickel	<0.63		2.0	0.63	ug/L		03/06/23 15:41	03/07/23 19:23	1
Selenium	<0.98		2.5	0.98	ug/L		03/06/23 15:41	03/08/23 18:41	1
Silver	<0.12		0.50	0.12	ug/L		03/06/23 15:41	03/07/23 19:23	1
Thallium	<0.57		2.0	0.57	ug/L		03/06/23 15:41	03/07/23 19:23	1
Vanadium	<2.2		5.0	2.2	ug/L		03/06/23 15:41	03/07/23 19:23	1
Zinc	<6.9		20.0	6.9	ug/L		03/06/23 15:41	03/07/23 19:23	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.079		0.20	0.079	ug/L		03/07/23 11:05	03/08/23 10:46	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**386**		0.91	0.46	mg/L		03/06/23 15:41	03/09/23 10:06	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	**5.1**		1.0	0.12	mg/L			03/03/23 15:28	1
Fluoride (EPA 300.0)	**0.22**	**J**	1.0	0.19	mg/L			03/03/23 15:28	1
Sulfate (EPA 300.0)	**15.6**		1.0	0.21	mg/L			03/03/23 15:28	1

Client: Vernon County Solid Waste & Recycling
Job ID: 500-230147-1
Project/Site: Vernon County Landfill Expansion

Client Sample ID: MW-16
Lab Sample ID: 500-230147-2
Date Collected: 03/01/23 09:00
Matrix: Water
Date Received: 03/02/23 10:30

General Chemistry - Dissolved (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N (EPA N07-0003)	1.0		0.10	0.041	mg/L			03/06/23 10:20	1
Alkalinity (SM 2320B)	381		5.0	3.7	mg/L			03/07/23 15:23	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-230147-1

Client Sample ID: Trip Blank

Date Collected: 03/01/23 00:00
Date Received: 03/02/23 10:30

Lab Sample ID: 500-230147-3

Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			03/07/23 15:55	1
Bromobenzene	<0.36		1.0	0.36	ug/L			03/07/23 15:55	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			03/07/23 15:55	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			03/07/23 15:55	1
Bromoform	<0.48		1.0	0.48	ug/L			03/07/23 15:55	1
Bromomethane	<0.80	*	3.0	0.80	ug/L			03/07/23 15:55	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			03/07/23 15:55	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			03/07/23 15:55	1
Chloroethane	<0.51		1.0	0.51	ug/L			03/07/23 15:55	1
Chloroform	<0.37		2.0	0.37	ug/L			03/07/23 15:55	1
Chloromethane	<0.32		1.0	0.32	ug/L			03/07/23 15:55	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			03/07/23 15:55	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			03/07/23 15:55	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			03/07/23 15:55	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			03/07/23 15:55	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			03/07/23 15:55	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			03/07/23 15:55	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			03/07/23 15:55	1
Dibromomethane	<0.27		1.0	0.27	ug/L			03/07/23 15:55	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			03/07/23 15:55	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			03/07/23 15:55	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			03/07/23 15:55	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			03/07/23 15:55	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			03/07/23 15:55	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			03/07/23 15:55	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			03/07/23 15:55	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			03/07/23 15:55	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			03/07/23 15:55	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			03/07/23 15:55	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			03/07/23 15:55	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			03/07/23 15:55	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			03/07/23 15:55	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			03/07/23 15:55	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			03/07/23 15:55	1
Methylene Chloride	**1.6**	**J**	5.0	1.6	ug/L			03/07/23 15:55	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			03/07/23 15:55	1
Naphthalene	<0.34		1.0	0.34	ug/L			03/07/23 15:55	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			03/07/23 15:55	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			03/07/23 15:55	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			03/07/23 15:55	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			03/07/23 15:55	1
Styrene	<0.39		1.0	0.39	ug/L			03/07/23 15:55	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			03/07/23 15:55	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			03/07/23 15:55	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			03/07/23 15:55	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			03/07/23 15:55	1
Toluene	<0.15		0.50	0.15	ug/L			03/07/23 15:55	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			03/07/23 15:55	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			03/07/23 15:55	1

Client: Vernon County Solid Waste & Recycling
Job ID: 500-230147-1
Project/Site: Vernon County Landfill Expansion

Client Sample ID: Trip Blank
Lab Sample ID: 500-230147-3

Date Collected: 03/01/23 00:00
Matrix: Water

Date Received: 03/02/23 10:30

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			03/07/23 15:55	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			03/07/23 15:55	1
1,1,1-Trichloroethane	<0.38	*	1.0	0.38	ug/L			03/07/23 15:55	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			03/07/23 15:55	1
Trichloroethene	<0.16		0.50	0.16	ug/L			03/07/23 15:55	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			03/07/23 15:55	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			03/07/23 15:55	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			03/07/23 15:55	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			03/07/23 15:55	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			03/07/23 15:55	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			03/07/23 15:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*72 - 124*		*03/07/23 15:55*	*1*
Dibromofluoromethane (Surr)	*90*		*75 - 120*		*03/07/23 15:55*	*1*
1,2-Dichloroethane-d4 (Surr)	*83*		*75 - 126*		*03/07/23 15:55*	*1*
Toluene-d8 (Surr)	*89*		*75 - 120*		*03/07/23 15:55*	*1*

Definitions/Glossary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-230147-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
J	Reported value was between the limit of detection and the limit of quantitation.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Reported value was between the limit of detection and the limit of quantitation.

General Chemistry

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
J	Reported value was between the limit of detection and the limit of quantitation.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-230147-1
Project/Site: Vernon County Landfill Expansion

GC/MS VOA

Analysis Batch: 701394

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-230147-1	MW-14WT	Total/NA	Water	8260B	
500-230147-2	MW-16	Total/NA	Water	8260B	
500-230147-3	Trip Blank	Total/NA	Water	8260B	
MB 500-701394/8	Method Blank	Total/NA	Water	8260B	
LCS 500-701394/9	Lab Control Sample	Total/NA	Water	8260B	

Metals

Prep Batch: 701302

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-230147-1	MW-14WT	Dissolved	Water	3005A	
500-230147-2	MW-16	Dissolved	Water	3005A	
MB 500-701302/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-701302/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 701436

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-230147-1	MW-14WT	Dissolved	Water	7470A	
500-230147-2	MW-16	Dissolved	Water	7470A	
MB 500-701436/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-701436/13-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 701606

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-230147-1	MW-14WT	Dissolved	Water	6020B	701302
500-230147-2	MW-16	Dissolved	Water	6020B	701302
MB 500-701302/1-A	Method Blank	Total Recoverable	Water	6020B	701302
LCS 500-701302/2-A	Lab Control Sample	Total Recoverable	Water	6020B	701302

Analysis Batch: 701622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-230147-1	MW-14WT	Dissolved	Water	7470A	701436
500-230147-2	MW-16	Dissolved	Water	7470A	701436
MB 500-701436/12-A	Method Blank	Total/NA	Water	7470A	701436
LCS 500-701436/13-A	Lab Control Sample	Total/NA	Water	7470A	701436

Analysis Batch: 701771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-230147-1	MW-14WT	Dissolved	Water	6020B	701302
500-230147-2	MW-16	Dissolved	Water	6020B	701302
MB 500-701302/1-A	Method Blank	Total Recoverable	Water	6020B	701302
LCS 500-701302/2-A	Lab Control Sample	Total Recoverable	Water	6020B	701302

Analysis Batch: 701773

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-230147-1	MW-14WT	Dissolved	Water	SM 2340B	701302
500-230147-2	MW-16	Dissolved	Water	SM 2340B	701302

QC Association Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-230147-1
Project/Site: Vernon County Landfill Expansion

General Chemistry

Analysis Batch: 701132

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-230147-1	MW-14WT	Dissolved	Water	300.0	
500-230147-2	MW-16	Dissolved	Water	300.0	
MB 500-701132/3	Method Blank	Total/NA	Water	300.0	
LCS 500-701132/4	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 701264

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-230147-1	MW-14WT	Dissolved	Water	N07-0003	
500-230147-2	MW-16	Dissolved	Water	N07-0003	
MB 500-701264/77	Method Blank	Total/NA	Water	N07-0003	
LCS 500-701264/78	Lab Control Sample	Total/NA	Water	N07-0003	

Analysis Batch: 701519

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-230147-1	MW-14WT	Dissolved	Water	SM 2320B	
500-230147-2	MW-16	Dissolved	Water	SM 2320B	
MB 500-701519/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-701519/4	Lab Control Sample	Total/NA	Water	SM 2320B	

Surrogate Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-230147-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	DBFM	DCA	TOL
Lab Sample ID	Client Sample ID	(72-124)	(75-120)	(75-126)	(75-120)
500-230147-1	MW-14WT	94	106	100	86
500-230147-2	MW-16	93	104	99	86
500-230147-3	Trip Blank	96	90	83	89
LCS 500-701394/9	Lab Control Sample	91	108	89	88
MB 500-701394/8	Method Blank	95	104	95	99

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-701394/8
Matrix: Water
Analysis Batch: 701394

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			03/07/23 14:37	1
Bromobenzene	<0.36		1.0	0.36	ug/L			03/07/23 14:37	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			03/07/23 14:37	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			03/07/23 14:37	1
Bromoform	<0.48		1.0	0.48	ug/L			03/07/23 14:37	1
Bromomethane	<0.80		3.0	0.80	ug/L			03/07/23 14:37	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			03/07/23 14:37	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			03/07/23 14:37	1
Chloroethane	<0.51		1.0	0.51	ug/L			03/07/23 14:37	1
Chloroform	<0.37		2.0	0.37	ug/L			03/07/23 14:37	1
Chloromethane	<0.32		1.0	0.32	ug/L			03/07/23 14:37	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			03/07/23 14:37	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			03/07/23 14:37	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			03/07/23 14:37	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			03/07/23 14:37	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			03/07/23 14:37	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			03/07/23 14:37	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			03/07/23 14:37	1
Dibromomethane	<0.27		1.0	0.27	ug/L			03/07/23 14:37	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			03/07/23 14:37	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			03/07/23 14:37	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			03/07/23 14:37	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			03/07/23 14:37	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			03/07/23 14:37	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			03/07/23 14:37	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			03/07/23 14:37	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			03/07/23 14:37	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			03/07/23 14:37	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			03/07/23 14:37	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			03/07/23 14:37	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			03/07/23 14:37	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			03/07/23 14:37	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			03/07/23 14:37	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			03/07/23 14:37	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			03/07/23 14:37	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			03/07/23 14:37	1
Naphthalene	<0.34		1.0	0.34	ug/L			03/07/23 14:37	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			03/07/23 14:37	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			03/07/23 14:37	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			03/07/23 14:37	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			03/07/23 14:37	1
Styrene	<0.39		1.0	0.39	ug/L			03/07/23 14:37	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			03/07/23 14:37	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			03/07/23 14:37	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			03/07/23 14:37	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			03/07/23 14:37	1
Toluene	<0.15		0.50	0.15	ug/L			03/07/23 14:37	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			03/07/23 14:37	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 500-701394/8
Matrix: Water
Analysis Batch: 701394

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			03/07/23 14:37	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			03/07/23 14:37	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			03/07/23 14:37	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			03/07/23 14:37	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			03/07/23 14:37	1
Trichloroethene	<0.16		0.50	0.16	ug/L			03/07/23 14:37	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			03/07/23 14:37	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			03/07/23 14:37	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			03/07/23 14:37	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			03/07/23 14:37	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			03/07/23 14:37	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			03/07/23 14:37	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*72 - 124*		*03/07/23 14:37*	*1*
Dibromofluoromethane (Surr)	*104*		*75 - 120*		*03/07/23 14:37*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 126*		*03/07/23 14:37*	*1*
Toluene-d8 (Surr)	*99*		*75 - 120*		*03/07/23 14:37*	*1*

Lab Sample ID: LCS 500-701394/9
Matrix: Water
Analysis Batch: 701394

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	50.0	49.3		ug/L		99	70 - 120
Bromobenzene	50.0	49.6		ug/L		99	70 - 122
Bromochloromethane	50.0	60.8		ug/L		122	65 - 122
Bromodichloromethane	50.0	51.9		ug/L		104	69 - 120
Bromoform	50.0	41.5		ug/L		83	56 - 132
Bromomethane	50.0	85.1	*	ug/L		170	40 - 152
Carbon tetrachloride	50.0	66.1		ug/L		132	59 - 133
Chlorobenzene	50.0	49.8		ug/L		100	70 - 120
Chloroethane	50.0	51.3		ug/L		103	48 - 136
Chloroform	50.0	52.2		ug/L		104	70 - 120
Chloromethane	50.0	50.0		ug/L		100	56 - 152
2-Chlorotoluene	50.0	47.6		ug/L		95	70 - 125
4-Chlorotoluene	50.0	49.1		ug/L		98	68 - 124
cis-1,2-Dichloroethene	50.0	56.8		ug/L		114	70 - 125
cis-1,3-Dichloropropene	50.0	39.3		ug/L		79	64 - 127
Dibromochloromethane	50.0	49.4		ug/L		99	68 - 125
1,2-Dibromo-3-Chloropropane	50.0	37.1		ug/L		74	56 - 123
1,2-Dibromoethane	50.0	47.2		ug/L		94	70 - 125
Dibromomethane	50.0	50.5		ug/L		101	70 - 120
1,2-Dichlorobenzene	50.0	47.0		ug/L		94	70 - 125
1,3-Dichlorobenzene	50.0	48.4		ug/L		97	70 - 125
1,4-Dichlorobenzene	50.0	48.3		ug/L		97	70 - 120
Dichlorodifluoromethane	50.0	47.0		ug/L		94	40 - 159
1,1-Dichloroethane	50.0	46.9		ug/L		94	70 - 125

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-701394/9
Matrix: Water
Analysis Batch: 701394

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2-Dichloroethane	50.0	43.5		ug/L		87	68 - 127
1,1-Dichloroethene	50.0	58.9		ug/L		118	67 - 122
1,2-Dichloropropane	50.0	47.9		ug/L		96	67 - 130
1,3-Dichloropropane	50.0	44.7		ug/L		89	62 - 136
2,2-Dichloropropane	50.0	60.7		ug/L		121	58 - 139
1,1-Dichloropropene	50.0	50.8		ug/L		102	70 - 121
Ethylbenzene	50.0	44.5		ug/L		89	70 - 123
Hexachlorobutadiene	50.0	45.2		ug/L		90	51 - 150
Isopropylbenzene	50.0	47.1		ug/L		94	70 - 126
Methylene Chloride	50.0	55.7		ug/L		111	69 - 125
Methyl tert-butyl ether	50.0	48.8		ug/L		98	55 - 123
Naphthalene	50.0	35.2		ug/L		70	53 - 144
n-Butylbenzene	50.0	44.8		ug/L		90	68 - 125
N-Propylbenzene	50.0	48.7		ug/L		97	69 - 127
p-Isopropyltoluene	50.0	46.9		ug/L		94	70 - 125
sec-Butylbenzene	50.0	47.4		ug/L		95	70 - 123
Styrene	50.0	46.0		ug/L		92	70 - 120
tert-Butylbenzene	50.0	46.2		ug/L		92	70 - 121
1,1,1,2-Tetrachloroethane	50.0	47.0		ug/L		94	70 - 125
1,1,2,2-Tetrachloroethane	50.0	46.7		ug/L		93	62 - 140
Tetrachloroethene	50.0	49.3		ug/L		99	70 - 128
Toluene	50.0	43.0		ug/L		86	70 - 125
trans-1,2-Dichloroethene	50.0	56.2		ug/L		112	70 - 125
trans-1,3-Dichloropropene	50.0	41.8		ug/L		84	62 - 128
1,2,3-Trichlorobenzene	50.0	35.8		ug/L		72	51 - 145
1,2,4-Trichlorobenzene	50.0	39.5		ug/L		79	57 - 137
1,1,1-Trichloroethane	50.0	62.8	*	ug/L		126	70 - 125
1,1,2-Trichloroethane	50.0	47.4		ug/L		95	71 - 130
Trichloroethene	50.0	49.4		ug/L		99	70 - 125
Trichlorofluoromethane	50.0	55.0		ug/L		110	55 - 128
1,2,3-Trichloropropane	50.0	48.9		ug/L		98	50 - 133
1,2,4-Trimethylbenzene	50.0	46.4		ug/L		93	70 - 123
1,3,5-Trimethylbenzene	50.0	47.1		ug/L		94	70 - 123
Vinyl chloride	50.0	58.5		ug/L		117	64 - 126
Xylenes, Total	100	89.0		ug/L		89	70 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*91*		*72 - 124*
Dibromofluoromethane (Surr)	*108*		*75 - 120*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 126*
Toluene-d8 (Surr)	*88*		*75 - 120*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 500-701302/1-A
Matrix: Water
Analysis Batch: 701606

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 701302

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		03/06/23 15:41	03/07/23 19:13	1
Arsenic	<0.23		1.0	0.23	ug/L		03/06/23 15:41	03/07/23 19:13	1
Barium	<0.73		2.5	0.73	ug/L		03/06/23 15:41	03/07/23 19:13	1
Chromium	<1.1		5.0	1.1	ug/L		03/06/23 15:41	03/07/23 19:13	1
Cobalt	<0.40		1.0	0.40	ug/L		03/06/23 15:41	03/07/23 19:13	1
Copper	1.21	J	2.0	0.50	ug/L		03/06/23 15:41	03/07/23 19:13	1
Manganese	<0.79		2.5	0.79	ug/L		03/06/23 15:41	03/07/23 19:13	1
Nickel	<0.63		2.0	0.63	ug/L		03/06/23 15:41	03/07/23 19:13	1
Silver	<0.12		0.50	0.12	ug/L		03/06/23 15:41	03/07/23 19:13	1
Thallium	<0.57		2.0	0.57	ug/L		03/06/23 15:41	03/07/23 19:13	1
Vanadium	<2.2		5.0	2.2	ug/L		03/06/23 15:41	03/07/23 19:13	1
Zinc	<6.9		20.0	6.9	ug/L		03/06/23 15:41	03/07/23 19:13	1

Lab Sample ID: MB 500-701302/1-A
Matrix: Water
Analysis Batch: 701771

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 701302

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	<0.53		1.0	0.53	ug/L		03/06/23 15:41	03/08/23 18:30	1
Boron	<12.7		50.0	12.7	ug/L		03/06/23 15:41	03/08/23 18:30	1
Cadmium	0.212	J	0.50	0.17	ug/L		03/06/23 15:41	03/08/23 18:30	1
Lead	0.241	J	0.50	0.19	ug/L		03/06/23 15:41	03/08/23 18:30	1
Selenium	<0.98		2.5	0.98	ug/L		03/06/23 15:41	03/08/23 18:30	1

Lab Sample ID: LCS 500-701302/2-A
Matrix: Water
Analysis Batch: 701606

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 701302

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	500	508.0		ug/L		102	80 - 120
Arsenic	100	98.22		ug/L		98	80 - 120
Barium	500	510.6		ug/L		102	80 - 120
Chromium	200	210.3		ug/L		105	80 - 120
Cobalt	500	488.6		ug/L		98	80 - 120
Copper	250	254.1		ug/L		102	80 - 120
Manganese	500	532.2		ug/L		106	80 - 120
Nickel	500	503.1		ug/L		101	80 - 120
Silver	50.0	51.63		ug/L		103	80 - 120
Thallium	100	105.2		ug/L		105	80 - 120
Vanadium	500	519.0		ug/L		104	80 - 120
Zinc	500	516.2		ug/L		103	80 - 120

Lab Sample ID: LCS 500-701302/2-A
Matrix: Water
Analysis Batch: 701771

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 701302

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Beryllium	50.0	52.16		ug/L		104	80 - 120
Boron	1000	1019		ug/L		102	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 500-701302/2-A
Matrix: Water
Analysis Batch: 701771

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 701302

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cadmium	50.0	52.79		ug/L		106	80 - 120
Lead	100	110.0		ug/L		110	80 - 120
Selenium	100	101.3		ug/L		101	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-701436/12-A
Matrix: Water
Analysis Batch: 701622

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 701436

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.079		0.20	0.079	ug/L		03/07/23 11:05	03/08/23 10:09	1

Lab Sample ID: LCS 500-701436/13-A
Matrix: Water
Analysis Batch: 701622

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 701436

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.98	1.98		ug/L		100	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-701132/3
Matrix: Water
Analysis Batch: 701132

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.12		1.0	0.12	mg/L			03/03/23 11:40	1
Fluoride	<0.19		1.0	0.19	mg/L			03/03/23 11:40	1
Sulfate	<0.21		1.0	0.21	mg/L			03/03/23 11:40	1

Lab Sample ID: LCS 500-701132/4
Matrix: Water
Analysis Batch: 701132

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	20.33		mg/L		102	90 - 110
Fluoride	20.0	19.91		mg/L		100	90 - 110
Sulfate	20.0	18.85		mg/L		94	90 - 110

Method: N07-0003 - Enzymatic Nitrate-Nitrite Nitrogen

Lab Sample ID: MB 500-701264/77
Matrix: Water
Analysis Batch: 701264

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	<0.041	^	0.10	0.041	mg/L			03/06/23 10:17	1

Method: N07-0003 - Enzymatic Nitrate-Nitrite Nitrogen (Continued)

Lab Sample ID: LCS 500-701264/78
Matrix: Water
Analysis Batch: 701264

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	1.00	0.946	^	mg/L		95	90 - 110

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-701519/3
Matrix: Water
Analysis Batch: 701519

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			03/07/23 15:23	1

Lab Sample ID: LCS 500-701519/4
Matrix: Water
Analysis Batch: 701519

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	100	102.7		mg/L		103	90 - 110

Lab Chronicle

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-230147-1

Client Sample ID: MW-14WT

Date Collected: 03/01/23 08:00
Date Received: 03/02/23 10:30

Lab Sample ID: 500-230147-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	701394	W1T	EET CHI	03/07/23 16:19
Dissolved	Prep	3005A			701302	RN	EET CHI	03/06/23 15:41 - 03/06/23 16:11 [1]
Dissolved	Analysis	6020B		1	701771	FXG	EET CHI	03/08/23 18:37
Dissolved	Prep	3005A			701302	RN	EET CHI	03/06/23 15:41 - 03/06/23 16:11 [1]
Dissolved	Analysis	6020B		1	701606	FXG	EET CHI	03/07/23 19:20
Dissolved	Prep	7470A			701436	MJG	EET CHI	03/07/23 11:05 - 03/07/23 13:05 [1]
Dissolved	Analysis	7470A		1	701622	MJG	EET CHI	03/08/23 10:44
Dissolved	Prep	3005A			701302	RN	EET CHI	03/06/23 15:41 - 03/06/23 16:11 [1]
Dissolved	Analysis	SM 2340B		1	701773	FXG	EET CHI	03/09/23 10:06
Dissolved	Analysis	300.0		1	701132	MM	EET CHI	03/03/23 15:13
Dissolved	Analysis	N07-0003		1	701264	LP	EET CHI	03/06/23 10:20
Dissolved	Analysis	SM 2320B		1	701519	EH	EET CHI	03/07/23 15:23

Client Sample ID: MW-16

Date Collected: 03/01/23 09:00
Date Received: 03/02/23 10:30

Lab Sample ID: 500-230147-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	701394	W1T	EET CHI	03/07/23 16:43
Dissolved	Prep	3005A			701302	RN	EET CHI	03/06/23 15:41 - 03/06/23 16:11 [1]
Dissolved	Analysis	6020B		1	701771	FXG	EET CHI	03/08/23 18:41
Dissolved	Prep	3005A			701302	RN	EET CHI	03/06/23 15:41 - 03/06/23 16:11 [1]
Dissolved	Analysis	6020B		1	701606	FXG	EET CHI	03/07/23 19:23
Dissolved	Prep	7470A			701436	MJG	EET CHI	03/07/23 11:05 - 03/07/23 13:05 [1]
Dissolved	Analysis	7470A		1	701622	MJG	EET CHI	03/08/23 10:46
Dissolved	Prep	3005A			701302	RN	EET CHI	03/06/23 15:41 - 03/06/23 16:11 [1]
Dissolved	Analysis	SM 2340B		1	701773	FXG	EET CHI	03/09/23 10:06
Dissolved	Analysis	300.0		1	701132	MM	EET CHI	03/03/23 15:28
Dissolved	Analysis	N07-0003		1	701264	LP	EET CHI	03/06/23 10:20
Dissolved	Analysis	SM 2320B		1	701519	EH	EET CHI	03/07/23 15:23

Client Sample ID: Trip Blank

Date Collected: 03/01/23 00:00
Date Received: 03/02/23 10:30

Lab Sample ID: 500-230147-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	701394	W1T	EET CHI	03/07/23 15:55

[1] Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-230147-1
Project/Site: Vernon County Landfill Expansion

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999580010	08-31-23

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

eurofins | Environment Testing America

*send copy of report to SEH, Inc.

Client Information	Sampler	Lab PM	Carrier Tracking No(s)	COC No.
	Veronica Aranda	Fredrick Sandie		500-104724-44750 1
Client Contact.	Phone	E-Mail	State of Origin	Page
Stacie Sanborn	715-933-2351	Sandra Fredrick@et.eurofinsus com		Page 1 of 1
Company	PWSID			Job #
Vernon County Solid Waste & Recycling				500-230147

Address | Due Date Requested
City | TAT Requested (days)
State Zip. | Compliance Project: Δ Yes Δ No
Phone | PO #:
Email | WO #:
500-230147 COC
Project Name. | Project #: 50020572
Site | SSOW#:

Analysis Requested

Preservation Codes

A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Y Trizma, Z other (specify)

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SM2340B - Hardness - Diss. (Field Filtered)	2320B Alk Diss (Field Filtered)	300 - Chloride Diss (Field Filtered)	8260B - VOC	6020A - Cu/Mn/Zn Diss (Field Filtered)	300 Sulfate - Diss (Field Filtered)	6020A, 7470A - Diss. (Field Filtered) [As, Ba, Cd Cr Pb, Se, B Ag] + Hg	300 Flouride Diss. (Field Filtered)	353.2 - N+N Diss (Field Filtered)	6020A - Sb/Be/Co/Ni/Tl/V - Diss (Field Filtered)	Total Number of containers	Special Instructions/Note
				Preservation Code:															
1	MW-14WT	3/1/23	800	G	Water			X	X	X	X	X	X	X	X	X			
2	MW-16	3/1/23	900	G	Water			X	X	X	X	X	X	X	X	X			
	[redacted] VA	[redacted]		[redacted] VA	Water			[redacted] VA											
3	TRIP BLANK				Water														
					Water														
					Water														
					Water														
					Water														
					Water														
					Water														

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment: courier ice

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Veronica Aranda	3/1/23	SEH, Inc.	[signature]	3/2/23 1030	EST
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact Δ Yes Δ No | Custody Seal No | Cooler Temperature(s) °C and Other Remarks. 4.7-7.5.4

500-230147 Waybi

ORIGIN ID:RRLA (715) 933-2351
VERONICA ARANDA
SHORT ELLIOT HENDRICKSON
10 NORTH BRIGDE ST.

CHIPPEWA FALLS, WI 54729
UNITED STATES US

SHIP DATE: 09DEC22
ACTWGT: 25.00 LB MAN
CAD: 0269688/CAFE3616

TO **SAMPLE RECEIPT**
EUROFINS
2417 BOND ST.

UNIVERSITY PARK IL 60484
(262) 202-5955 REF:
INV:
PO: DEPT:

RMA.

FedEx Express

RETURNS MON-SAT
PRIORITY OVERNIGHT

FedEx
6155 6317 5281

THU - 02 MAR AA
PRIORITY OVERNIGHT

C JOTA

60484
IL-US
ORD

Mar2023 EAUA 581G7/9982/C088

Login Sample Receipt Checklist

Client: Vernon County Solid Waste & Recycling

Job Number: 500-230147-1

Login Number: 230147
List Number: 1
Creator: Scott, Sherri L

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.4
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Stacie Sanborn
Vernon County Solid Waste & Recycling
S3705 County Road LF
Viroqua, Wisconsin 54665

Generated 4/11/2023 5:27:38 PM

JOB DESCRIPTION

Vernon County Landfill Expansion

JOB NUMBER

500-231307-1

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Authorization



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Authorized for release by
Sandie Fredrick, Project Manager II
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

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Job ID: 500-231307-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-231307-1

Comments
No additional comments.

Receipt
The samples were received on 3/28/2023 10:10 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.1° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Field Service / Mobile Lab
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-231307-1

Client Sample ID: MW-17WT — Lab Sample ID: 500-231307-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.50	J	1.0	0.23	ug/L	1		6020B	Dissolved
Barium	32.8		2.5	0.73	ug/L	1		6020B	Dissolved
Boron	19.0	J	50.0	12.7	ug/L	1		6020B	Dissolved
Copper	0.62	J	2.0	0.50	ug/L	1		6020B	Dissolved
Manganese	12.2		2.5	0.79	ug/L	1		6020B	Dissolved
Nickel	0.73	J	2.0	0.63	ug/L	1		6020B	Dissolved
Hardness as calcium carbonate	270		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	4.5		1.0	0.12	mg/L	1		300.0	Dissolved
Fluoride	0.27	J	1.0	0.19	mg/L	1		300.0	Dissolved
Sulfate	5.4		1.0	0.21	mg/L	1		300.0	Dissolved
Nitrate Nitrite as N	0.20		0.10	0.041	mg/L	1		N07-0003	Dissolved
Alkalinity	265		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: MW-14WT — Lab Sample ID: 500-231307-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	1.0		1.0	0.23	ug/L	1		6020B	Dissolved
Barium	47.4		2.5	0.73	ug/L	1		6020B	Dissolved
Boron	13.4	J	50.0	12.7	ug/L	1		6020B	Dissolved
Chromium	1.4	J	5.0	1.1	ug/L	1		6020B	Dissolved
Copper	1.3	J	2.0	0.50	ug/L	1		6020B	Dissolved
Lead	0.39	J	0.50	0.19	ug/L	1		6020B	Dissolved
Manganese	303		2.5	0.79	ug/L	1		6020B	Dissolved
Hardness as calcium carbonate	234		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	4.3		1.0	0.12	mg/L	1		300.0	Dissolved
Fluoride	0.28	J	1.0	0.19	mg/L	1		300.0	Dissolved
Sulfate	3.0		1.0	0.21	mg/L	1		300.0	Dissolved
Nitrate Nitrite as N	0.28		0.10	0.041	mg/L	1		N07-0003	Dissolved
Alkalinity	224		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: MW-16 — Lab Sample ID: 500-231307-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.61	J	1.0	0.23	ug/L	1		6020B	Dissolved
Barium	61.0		2.5	0.73	ug/L	1		6020B	Dissolved
Boron	19.2	J	50.0	12.7	ug/L	1		6020B	Dissolved
Copper	2.6		2.0	0.50	ug/L	1		6020B	Dissolved
Manganese	5.3		2.5	0.79	ug/L	1		6020B	Dissolved
Hardness as calcium carbonate	355		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	5.9		1.0	0.12	mg/L	1		300.0	Dissolved
Fluoride	0.27	J	1.0	0.19	mg/L	1		300.0	Dissolved
Sulfate	14.0		1.0	0.21	mg/L	1		300.0	Dissolved
Nitrate Nitrite as N	0.67		0.10	0.041	mg/L	1		N07-0003	Dissolved
Alkalinity	376		5.0	3.7	mg/L	1		SM 2320B	Dissolved

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-231307-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	EET CHI
6020B	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	EET CHI
300.0	Anions, Ion Chromatography	EPA	EET CHI
N07-0003	Enzymatic Nitrate-Nitrite Nitrogen	EPA	EET CHI
SM 2320B	Alkalinity	SM	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
5030B	Purge and Trap	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-231307-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-231307-1	MW-17WT	Water	03/27/23 08:00	03/28/23 10:10
500-231307-2	MW-14WT	Water	03/27/23 10:00	03/28/23 10:10
500-231307-3	MW-16	Water	03/27/23 12:00	03/28/23 10:10

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-231307-1

Client Sample ID: MW-17WT
Date Collected: 03/27/23 08:00
Date Received: 03/28/23 10:10

Lab Sample ID: 500-231307-1
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<1.7		10	1.7	ug/L			04/07/23 19:00	1
Benzene	<0.15		0.50	0.15	ug/L			04/07/23 19:00	1
Bromobenzene	<0.36		1.0	0.36	ug/L			04/07/23 19:00	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			04/07/23 19:00	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			04/07/23 19:00	1
Bromoform	<0.48		1.0	0.48	ug/L			04/07/23 19:00	1
Bromomethane	<0.80		3.0	0.80	ug/L			04/07/23 19:00	1
2-Butanone (MEK)	<2.1		5.0	2.1	ug/L			04/07/23 19:00	1
Carbon disulfide	<0.45		2.0	0.45	ug/L			04/07/23 19:00	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			04/07/23 19:00	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			04/07/23 19:00	1
Chloroethane	<0.51		1.0	0.51	ug/L			04/07/23 19:00	1
Chloroform	<0.37		2.0	0.37	ug/L			04/07/23 19:00	1
Chloromethane	<0.32		1.0	0.32	ug/L			04/07/23 19:00	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			04/07/23 19:00	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			04/07/23 19:00	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			04/07/23 19:00	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			04/07/23 19:00	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			04/07/23 19:00	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			04/07/23 19:00	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			04/07/23 19:00	1
Dibromomethane	<0.27		1.0	0.27	ug/L			04/07/23 19:00	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			04/07/23 19:00	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			04/07/23 19:00	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			04/07/23 19:00	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			04/07/23 19:00	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			04/07/23 19:00	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			04/07/23 19:00	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			04/07/23 19:00	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			04/07/23 19:00	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			04/07/23 19:00	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			04/07/23 19:00	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			04/07/23 19:00	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/07/23 19:00	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			04/07/23 19:00	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			04/07/23 19:00	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			04/07/23 19:00	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			04/07/23 19:00	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			04/07/23 19:00	1
Naphthalene	<0.34		1.0	0.34	ug/L			04/07/23 19:00	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			04/07/23 19:00	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			04/07/23 19:00	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			04/07/23 19:00	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			04/07/23 19:00	1
Styrene	<0.39		1.0	0.39	ug/L			04/07/23 19:00	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			04/07/23 19:00	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			04/07/23 19:00	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			04/07/23 19:00	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			04/07/23 19:00	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-231307-1

Client Sample ID: MW-17WT

Date Collected: 03/27/23 08:00
Date Received: 03/28/23 10:10

Lab Sample ID: 500-231307-1

Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<1.9		10	1.9	ug/L			04/07/23 19:00	1
Toluene	<0.15		0.50	0.15	ug/L			04/07/23 19:00	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			04/07/23 19:00	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			04/07/23 19:00	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			04/07/23 19:00	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			04/07/23 19:00	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			04/07/23 19:00	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			04/07/23 19:00	1
Trichloroethene	<0.16		0.50	0.16	ug/L			04/07/23 19:00	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			04/07/23 19:00	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			04/07/23 19:00	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			04/07/23 19:00	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			04/07/23 19:00	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			04/07/23 19:00	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/07/23 19:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*72 - 124*		*04/07/23 19:00*	*1*
Dibromofluoromethane (Surr)	*95*		*75 - 120*		*04/07/23 19:00*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 126*		*04/07/23 19:00*	*1*
Toluene-d8 (Surr)	*102*		*75 - 120*		*04/07/23 19:00*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		04/04/23 09:31	04/04/23 18:34	1
Arsenic	**0.50**	**J**	1.0	0.23	ug/L		04/04/23 09:31	04/04/23 18:34	1
Barium	**32.8**		2.5	0.73	ug/L		04/04/23 09:31	04/04/23 18:34	1
Beryllium	<0.53		1.0	0.53	ug/L		04/04/23 09:31	04/04/23 18:34	1
Boron	**19.0**	**J**	50.0	12.7	ug/L		04/04/23 09:31	04/04/23 18:34	1
Cadmium	<0.17		0.50	0.17	ug/L		04/04/23 09:31	04/04/23 18:34	1
Chromium	<1.1		5.0	1.1	ug/L		04/04/23 09:31	04/04/23 18:34	1
Cobalt	<0.40		1.0	0.40	ug/L		04/04/23 09:31	04/04/23 18:34	1
Copper	**0.62**	**J**	2.0	0.50	ug/L		04/04/23 09:31	04/04/23 18:34	1
Lead	<0.19		0.50	0.19	ug/L		04/04/23 09:31	04/04/23 18:34	1
Manganese	**12.2**		2.5	0.79	ug/L		04/04/23 09:31	04/04/23 18:34	1
Nickel	**0.73**	**J**	2.0	0.63	ug/L		04/04/23 09:31	04/04/23 18:34	1
Selenium	<0.98		2.5	0.98	ug/L		04/04/23 09:31	04/04/23 18:34	1
Silver	<0.12		0.50	0.12	ug/L		04/04/23 09:31	04/04/23 18:34	1
Thallium	<0.57		2.0	0.57	ug/L		04/04/23 09:31	04/04/23 18:34	1
Vanadium	<2.2		5.0	2.2	ug/L		04/04/23 09:31	04/05/23 15:35	1
Zinc	<6.9		20.0	6.9	ug/L		04/04/23 09:31	04/04/23 18:34	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.079		0.20	0.079	ug/L		04/03/23 14:55	04/04/23 07:45	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**270**		0.91	0.46	mg/L		04/04/23 09:31	04/05/23 16:24	1

Client Sample Results

Client: Vernon County Solid Waste & Recycling
Job ID: 500-231307-1
Project/Site: Vernon County Landfill Expansion

Client Sample ID: MW-17WT
Lab Sample ID: 500-231307-1
Date Collected: 03/27/23 08:00
Matrix: Water
Date Received: 03/28/23 10:10

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	4.5		1.0	0.12	mg/L			03/29/23 17:08	1
Fluoride (EPA 300.0)	0.27	J	1.0	0.19	mg/L			03/29/23 17:08	1
Sulfate (EPA 300.0)	5.4		1.0	0.21	mg/L			03/29/23 17:08	1
Nitrate Nitrite as N (EPA N07-0003)	0.20		0.10	0.041	mg/L			04/03/23 10:06	1
Alkalinity (SM 2320B)	265		5.0	3.7	mg/L			03/30/23 15:13	1

Client: Vernon County Solid Waste & Recycling
Job ID: 500-231307-1
Project/Site: Vernon County Landfill Expansion

Client Sample ID: MW-14WT
Lab Sample ID: 500-231307-2
Date Collected: 03/27/23 10:00
Matrix: Water
Date Received: 03/28/23 10:10

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<1.7		10	1.7	ug/L			04/07/23 19:23	1
Benzene	<0.15		0.50	0.15	ug/L			04/07/23 19:23	1
Bromobenzene	<0.36		1.0	0.36	ug/L			04/07/23 19:23	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			04/07/23 19:23	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			04/07/23 19:23	1
Bromoform	<0.48		1.0	0.48	ug/L			04/07/23 19:23	1
Bromomethane	<0.80		3.0	0.80	ug/L			04/07/23 19:23	1
2-Butanone (MEK)	<2.1		5.0	2.1	ug/L			04/07/23 19:23	1
Carbon disulfide	<0.45		2.0	0.45	ug/L			04/07/23 19:23	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			04/07/23 19:23	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			04/07/23 19:23	1
Chloroethane	<0.51		1.0	0.51	ug/L			04/07/23 19:23	1
Chloroform	<0.37		2.0	0.37	ug/L			04/07/23 19:23	1
Chloromethane	<0.32		1.0	0.32	ug/L			04/07/23 19:23	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			04/07/23 19:23	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			04/07/23 19:23	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			04/07/23 19:23	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			04/07/23 19:23	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			04/07/23 19:23	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			04/07/23 19:23	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			04/07/23 19:23	1
Dibromomethane	<0.27		1.0	0.27	ug/L			04/07/23 19:23	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			04/07/23 19:23	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			04/07/23 19:23	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			04/07/23 19:23	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			04/07/23 19:23	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			04/07/23 19:23	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			04/07/23 19:23	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			04/07/23 19:23	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			04/07/23 19:23	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			04/07/23 19:23	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			04/07/23 19:23	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			04/07/23 19:23	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/07/23 19:23	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			04/07/23 19:23	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			04/07/23 19:23	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			04/07/23 19:23	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			04/07/23 19:23	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			04/07/23 19:23	1
Naphthalene	<0.34		1.0	0.34	ug/L			04/07/23 19:23	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			04/07/23 19:23	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			04/07/23 19:23	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			04/07/23 19:23	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			04/07/23 19:23	1
Styrene	<0.39		1.0	0.39	ug/L			04/07/23 19:23	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			04/07/23 19:23	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			04/07/23 19:23	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			04/07/23 19:23	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			04/07/23 19:23	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-231307-1

Client Sample ID: MW-14WT

Date Collected: 03/27/23 10:00
Date Received: 03/28/23 10:10

Lab Sample ID: 500-231307-2

Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<1.9		10	1.9	ug/L			04/07/23 19:23	1
Toluene	<0.15		0.50	0.15	ug/L			04/07/23 19:23	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			04/07/23 19:23	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			04/07/23 19:23	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			04/07/23 19:23	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			04/07/23 19:23	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			04/07/23 19:23	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			04/07/23 19:23	1
Trichloroethene	<0.16		0.50	0.16	ug/L			04/07/23 19:23	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			04/07/23 19:23	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			04/07/23 19:23	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			04/07/23 19:23	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			04/07/23 19:23	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			04/07/23 19:23	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/07/23 19:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*109*		*72 - 124*		*04/07/23 19:23*	*1*
Dibromofluoromethane (Surr)	*96*		*75 - 120*		*04/07/23 19:23*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 126*		*04/07/23 19:23*	*1*
Toluene-d8 (Surr)	*102*		*75 - 120*		*04/07/23 19:23*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.0**		1.0	0.23	ug/L		04/04/23 09:31	04/04/23 18:39	1
Barium	**47.4**		2.5	0.73	ug/L		04/04/23 09:31	04/04/23 18:39	1
Boron	**13.4**	**J**	50.0	12.7	ug/L		04/04/23 09:31	04/04/23 18:39	1
Cadmium	<0.17		0.50	0.17	ug/L		04/04/23 09:31	04/04/23 18:39	1
Chromium	**1.4**	**J**	5.0	1.1	ug/L		04/04/23 09:31	04/04/23 18:39	1
Copper	**1.3**	**J**	2.0	0.50	ug/L		04/04/23 09:31	04/04/23 18:39	1
Lead	**0.39**	**J**	0.50	0.19	ug/L		04/04/23 09:31	04/04/23 18:39	1
Manganese	**303**		2.5	0.79	ug/L		04/04/23 09:31	04/04/23 18:39	1
Selenium	<0.98		2.5	0.98	ug/L		04/04/23 09:31	04/04/23 18:39	1
Silver	<0.12		0.50	0.12	ug/L		04/04/23 09:31	04/04/23 18:39	1
Zinc	<6.9		20.0	6.9	ug/L		04/04/23 09:31	04/04/23 18:39	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.079		0.20	0.079	ug/L		04/03/23 14:55	04/04/23 08:25	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**234**		0.91	0.46	mg/L		04/04/23 09:31	04/05/23 16:24	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	**4.3**		1.0	0.12	mg/L			03/29/23 17:38	1
Fluoride (EPA 300.0)	**0.28**	**J**	1.0	0.19	mg/L			03/29/23 17:38	1
Sulfate (EPA 300.0)	**3.0**		1.0	0.21	mg/L			03/29/23 17:38	1
Nitrate Nitrite as N (EPA N07-0003)	**0.28**		0.10	0.041	mg/L			04/03/23 10:06	1
Alkalinity (SM 2320B)	**224**		5.0	3.7	mg/L			03/30/23 15:13	1

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-231307-1

Client Sample ID: MW-16
Date Collected: 03/27/23 12:00
Date Received: 03/28/23 10:10

Lab Sample ID: 500-231307-3
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<1.7		10	1.7	ug/L			04/07/23 19:46	1
Benzene	<0.15		0.50	0.15	ug/L			04/07/23 19:46	1
Bromobenzene	<0.36		1.0	0.36	ug/L			04/07/23 19:46	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			04/07/23 19:46	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			04/07/23 19:46	1
Bromoform	<0.48		1.0	0.48	ug/L			04/07/23 19:46	1
Bromomethane	<0.80		3.0	0.80	ug/L			04/07/23 19:46	1
2-Butanone (MEK)	<2.1		5.0	2.1	ug/L			04/07/23 19:46	1
Carbon disulfide	<0.45		2.0	0.45	ug/L			04/07/23 19:46	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			04/07/23 19:46	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			04/07/23 19:46	1
Chloroethane	<0.51		1.0	0.51	ug/L			04/07/23 19:46	1
Chloroform	<0.37		2.0	0.37	ug/L			04/07/23 19:46	1
Chloromethane	<0.32		1.0	0.32	ug/L			04/07/23 19:46	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			04/07/23 19:46	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			04/07/23 19:46	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			04/07/23 19:46	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			04/07/23 19:46	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			04/07/23 19:46	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			04/07/23 19:46	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			04/07/23 19:46	1
Dibromomethane	<0.27		1.0	0.27	ug/L			04/07/23 19:46	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			04/07/23 19:46	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			04/07/23 19:46	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			04/07/23 19:46	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			04/07/23 19:46	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			04/07/23 19:46	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			04/07/23 19:46	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			04/07/23 19:46	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			04/07/23 19:46	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			04/07/23 19:46	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			04/07/23 19:46	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			04/07/23 19:46	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/07/23 19:46	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			04/07/23 19:46	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			04/07/23 19:46	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			04/07/23 19:46	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			04/07/23 19:46	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			04/07/23 19:46	1
Naphthalene	<0.34		1.0	0.34	ug/L			04/07/23 19:46	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			04/07/23 19:46	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			04/07/23 19:46	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			04/07/23 19:46	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			04/07/23 19:46	1
Styrene	<0.39		1.0	0.39	ug/L			04/07/23 19:46	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			04/07/23 19:46	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			04/07/23 19:46	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			04/07/23 19:46	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			04/07/23 19:46	1

Client Sample ID: MW-16
Date Collected: 03/27/23 12:00
Date Received: 03/28/23 10:10

Lab Sample ID: 500-231307-3
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<1.9		10	1.9	ug/L			04/07/23 19:46	1
Toluene	<0.15		0.50	0.15	ug/L			04/07/23 19:46	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			04/07/23 19:46	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			04/07/23 19:46	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			04/07/23 19:46	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			04/07/23 19:46	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			04/07/23 19:46	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			04/07/23 19:46	1
Trichloroethene	<0.16		0.50	0.16	ug/L			04/07/23 19:46	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			04/07/23 19:46	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			04/07/23 19:46	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			04/07/23 19:46	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			04/07/23 19:46	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			04/07/23 19:46	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/07/23 19:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*109*		*72 - 124*		*04/07/23 19:46*	*1*
Dibromofluoromethane (Surr)	*92*		*75 - 120*		*04/07/23 19:46*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 126*		*04/07/23 19:46*	*1*
Toluene-d8 (Surr)	*102*		*75 - 120*		*04/07/23 19:46*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.61**	**J**	1.0	0.23	ug/L		04/04/23 09:31	04/04/23 18:43	1
Barium	**61.0**		2.5	0.73	ug/L		04/04/23 09:31	04/04/23 18:43	1
Boron	**19.2**	**J**	50.0	12.7	ug/L		04/04/23 09:31	04/04/23 18:43	1
Cadmium	<0.17		0.50	0.17	ug/L		04/04/23 09:31	04/04/23 18:43	1
Chromium	<1.1		5.0	1.1	ug/L		04/04/23 09:31	04/04/23 18:43	1
Copper	**2.6**		2.0	0.50	ug/L		04/04/23 09:31	04/04/23 18:43	1
Lead	<0.19		0.50	0.19	ug/L		04/04/23 09:31	04/04/23 18:43	1
Manganese	**5.3**		2.5	0.79	ug/L		04/04/23 09:31	04/04/23 18:43	1
Selenium	<0.98		2.5	0.98	ug/L		04/04/23 09:31	04/04/23 18:43	1
Silver	<0.12		0.50	0.12	ug/L		04/04/23 09:31	04/04/23 18:43	1
Zinc	<6.9		20.0	6.9	ug/L		04/04/23 09:31	04/04/23 18:43	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.079		0.20	0.079	ug/L		04/03/23 14:55	04/04/23 08:27	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**355**		0.91	0.46	mg/L		04/04/23 09:31	04/05/23 16:24	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	**5.9**		1.0	0.12	mg/L			03/29/23 17:53	1
Fluoride (EPA 300.0)	**0.27**	**J**	1.0	0.19	mg/L			03/29/23 17:53	1
Sulfate (EPA 300.0)	**14.0**		1.0	0.21	mg/L			03/29/23 17:53	1
Nitrate Nitrite as N (EPA N07-0003)	**0.67**		0.10	0.041	mg/L			04/03/23 10:08	1
Alkalinity (SM 2320B)	**376**		5.0	3.7	mg/L			03/30/23 15:13	1

Definitions/Glossary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-231307-1
Project/Site: Vernon County Landfill Expansion

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

Metals

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

General Chemistry

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

GC/MS VOA

Analysis Batch: 706593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-231307-1	MW-17WT	Total/NA	Water	8260B	
500-231307-2	MW-14WT	Total/NA	Water	8260B	
500-231307-3	MW-16	Total/NA	Water	8260B	
MB 500-706593/8	Method Blank	Total/NA	Water	8260B	
LCS 500-706593/6	Lab Control Sample	Total/NA	Water	8260B	

Metals

Prep Batch: 705605

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-231307-1	MW-17WT	Dissolved	Water	7470A	
500-231307-2	MW-14WT	Dissolved	Water	7470A	
500-231307-3	MW-16	Dissolved	Water	7470A	
MB 500-705605/13-A	Method Blank	Total/NA	Water	7470A	
LCS 500-705605/12-A	Lab Control Sample	Total/NA	Water	7470A	
500-231307-1 MS	MW-17WT	Dissolved	Water	7470A	
500-231307-1 MSD	MW-17WT	Dissolved	Water	7470A	
500-231307-1 DU	MW-17WT	Dissolved	Water	7470A	

Prep Batch: 705758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-231307-1	MW-17WT	Dissolved	Water	3005A	
500-231307-2	MW-14WT	Dissolved	Water	3005A	
500-231307-3	MW-16	Dissolved	Water	3005A	
MB 500-705758/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-705758/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 705825

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-231307-1	MW-17WT	Dissolved	Water	7470A	705605
500-231307-2	MW-14WT	Dissolved	Water	7470A	705605
500-231307-3	MW-16	Dissolved	Water	7470A	705605
MB 500-705605/13-A	Method Blank	Total/NA	Water	7470A	705605
LCS 500-705605/12-A	Lab Control Sample	Total/NA	Water	7470A	705605
500-231307-1 MS	MW-17WT	Dissolved	Water	7470A	705605
500-231307-1 MSD	MW-17WT	Dissolved	Water	7470A	705605
500-231307-1 DU	MW-17WT	Dissolved	Water	7470A	705605

Analysis Batch: 706031

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-231307-1	MW-17WT	Dissolved	Water	6020B	705758
500-231307-2	MW-14WT	Dissolved	Water	6020B	705758
500-231307-3	MW-16	Dissolved	Water	6020B	705758
MB 500-705758/1-A	Method Blank	Total Recoverable	Water	6020B	705758
LCS 500-705758/2-A	Lab Control Sample	Total Recoverable	Water	6020B	705758

Analysis Batch: 706109

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-231307-1	MW-17WT	Dissolved	Water	6020B	705758
MB 500-705758/1-A	Method Blank	Total Recoverable	Water	6020B	705758
LCS 500-705758/2-A	Lab Control Sample	Total Recoverable	Water	6020B	705758

QC Association Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-231307-1
Project/Site: Vernon County Landfill Expansion

Metals

Analysis Batch: 706114

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-231307-1	MW-17WT	Dissolved	Water	SM 2340B	705758
500-231307-2	MW-14WT	Dissolved	Water	SM 2340B	705758
500-231307-3	MW-16	Dissolved	Water	SM 2340B	705758

General Chemistry

Analysis Batch: 704802

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-231307-1	MW-17WT	Dissolved	Water	300.0	
500-231307-2	MW-14WT	Dissolved	Water	300.0	
500-231307-3	MW-16	Dissolved	Water	300.0	
MB 500-704802/11	Method Blank	Total/NA	Water	300.0	
LCS 500-704802/12	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 705443

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-231307-1	MW-17WT	Dissolved	Water	SM 2320B	
500-231307-2	MW-14WT	Dissolved	Water	SM 2320B	
500-231307-3	MW-16	Dissolved	Water	SM 2320B	
MB 500-705443/29	Method Blank	Total/NA	Water	SM 2320B	
MB 500-705443/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-705443/30	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 500-705443/4	Lab Control Sample	Total/NA	Water	SM 2320B	
500-231307-1 DU	MW-17WT	Dissolved	Water	SM 2320B	

Analysis Batch: 705529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-231307-1	MW-17WT	Dissolved	Water	N07-0003	
500-231307-2	MW-14WT	Dissolved	Water	N07-0003	
500-231307-3	MW-16	Dissolved	Water	N07-0003	
MB 500-705529/77	Method Blank	Total/NA	Water	N07-0003	
LCS 500-705529/79	Lab Control Sample	Total/NA	Water	N07-0003	

Surrogate Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-231307-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	DBFM	DCA	TOL
Lab Sample ID	Client Sample ID	(72-124)	(75-120)	(75-126)	(75-120)
500-231307-1	MW-17WT	107	95	98	102
500-231307-2	MW-14WT	109	96	98	102
500-231307-3	MW-16	109	92	99	102
LCS 500-706593/6	Lab Control Sample	104	98	99	103
MB 500-706593/8	Method Blank	109	95	97	100

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-706593/8
Matrix: Water
Analysis Batch: 706593

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<1.7		10	1.7	ug/L			04/07/23 14:54	1
Benzene	<0.15		0.50	0.15	ug/L			04/07/23 14:54	1
Bromobenzene	<0.36		1.0	0.36	ug/L			04/07/23 14:54	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			04/07/23 14:54	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			04/07/23 14:54	1
Bromoform	0.584	J	1.0	0.48	ug/L			04/07/23 14:54	1
Bromomethane	<0.80		3.0	0.80	ug/L			04/07/23 14:54	1
2-Butanone (MEK)	2.38	J	5.0	2.1	ug/L			04/07/23 14:54	1
Carbon disulfide	<0.45		2.0	0.45	ug/L			04/07/23 14:54	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			04/07/23 14:54	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			04/07/23 14:54	1
Chloroethane	<0.51		1.0	0.51	ug/L			04/07/23 14:54	1
Chloroform	<0.37		2.0	0.37	ug/L			04/07/23 14:54	1
Chloromethane	<0.32		1.0	0.32	ug/L			04/07/23 14:54	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			04/07/23 14:54	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			04/07/23 14:54	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			04/07/23 14:54	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			04/07/23 14:54	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			04/07/23 14:54	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			04/07/23 14:54	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			04/07/23 14:54	1
Dibromomethane	<0.27		1.0	0.27	ug/L			04/07/23 14:54	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			04/07/23 14:54	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			04/07/23 14:54	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			04/07/23 14:54	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			04/07/23 14:54	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			04/07/23 14:54	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			04/07/23 14:54	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			04/07/23 14:54	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			04/07/23 14:54	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			04/07/23 14:54	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			04/07/23 14:54	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			04/07/23 14:54	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/07/23 14:54	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			04/07/23 14:54	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			04/07/23 14:54	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			04/07/23 14:54	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			04/07/23 14:54	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			04/07/23 14:54	1
Naphthalene	<0.34		1.0	0.34	ug/L			04/07/23 14:54	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			04/07/23 14:54	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			04/07/23 14:54	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			04/07/23 14:54	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			04/07/23 14:54	1
Styrene	<0.39		1.0	0.39	ug/L			04/07/23 14:54	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			04/07/23 14:54	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			04/07/23 14:54	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			04/07/23 14:54	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 500-706593/8
Matrix: Water
Analysis Batch: 706593

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	<0.37		1.0	0.37	ug/L			04/07/23 14:54	1
Tetrahydrofuran	<1.9		10	1.9	ug/L			04/07/23 14:54	1
Toluene	<0.15		0.50	0.15	ug/L			04/07/23 14:54	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			04/07/23 14:54	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			04/07/23 14:54	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			04/07/23 14:54	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			04/07/23 14:54	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			04/07/23 14:54	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			04/07/23 14:54	1
Trichloroethene	<0.16		0.50	0.16	ug/L			04/07/23 14:54	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			04/07/23 14:54	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			04/07/23 14:54	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			04/07/23 14:54	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			04/07/23 14:54	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			04/07/23 14:54	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/07/23 14:54	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*109*		*72 - 124*		*04/07/23 14:54*	*1*
Dibromofluoromethane (Surr)	*95*		*75 - 120*		*04/07/23 14:54*	*1*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 126*		*04/07/23 14:54*	*1*
Toluene-d8 (Surr)	*100*		*75 - 120*		*04/07/23 14:54*	*1*

Lab Sample ID: LCS 500-706593/6
Matrix: Water
Analysis Batch: 706593

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	50.0	46.5		ug/L		93	40 - 143
Benzene	50.0	50.8		ug/L		102	70 - 120
Bromobenzene	50.0	55.1		ug/L		110	70 - 122
Bromochloromethane	50.0	48.8		ug/L		98	65 - 122
Bromodichloromethane	50.0	50.2		ug/L		100	69 - 120
Bromoform	50.0	49.6		ug/L		99	56 - 132
Bromomethane	50.0	52.1		ug/L		104	40 - 152
2-Butanone (MEK)	50.0	43.9		ug/L		88	46 - 144
Carbon disulfide	50.0	44.8		ug/L		90	66 - 120
Carbon tetrachloride	50.0	48.9		ug/L		98	59 - 133
Chlorobenzene	50.0	51.0		ug/L		102	70 - 120
Chloroethane	50.0	45.1		ug/L		90	48 - 136
Chloroform	50.0	47.7		ug/L		95	70 - 120
Chloromethane	50.0	34.2		ug/L		68	56 - 152
2-Chlorotoluene	50.0	50.2		ug/L		100	70 - 125
4-Chlorotoluene	50.0	51.9		ug/L		104	68 - 124
cis-1,2-Dichloroethene	50.0	49.8		ug/L		100	70 - 125
cis-1,3-Dichloropropene	50.0	51.1		ug/L		102	64 - 127
Dibromochloromethane	50.0	50.4		ug/L		101	68 - 125
1,2-Dibromo-3-Chloropropane	50.0	44.4		ug/L		89	56 - 123

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-706593/6
Matrix: Water
Analysis Batch: 706593

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2-Dibromoethane	50.0	57.2		ug/L		114	70 - 125
Dibromomethane	50.0	53.1		ug/L		106	70 - 120
1,2-Dichlorobenzene	50.0	49.4		ug/L		99	70 - 125
1,3-Dichlorobenzene	50.0	51.5		ug/L		103	70 - 125
1,4-Dichlorobenzene	50.0	51.4		ug/L		103	70 - 120
Dichlorodifluoromethane	50.0	45.0		ug/L		90	40 - 159
1,1-Dichloroethane	50.0	44.1		ug/L		88	70 - 125
1,2-Dichloroethane	50.0	49.6		ug/L		99	68 - 127
1,1-Dichloroethene	50.0	47.8		ug/L		96	67 - 122
1,2-Dichloropropane	50.0	46.9		ug/L		94	67 - 130
1,3-Dichloropropane	50.0	54.1		ug/L		108	62 - 136
2,2-Dichloropropane	50.0	45.5		ug/L		91	58 - 139
1,1-Dichloropropene	50.0	51.5		ug/L		103	70 - 121
Ethylbenzene	50.0	51.5		ug/L		103	70 - 123
Hexachlorobutadiene	50.0	50.4		ug/L		101	51 - 150
Isopropylbenzene	50.0	50.3		ug/L		101	70 - 126
Methylene Chloride	50.0	47.0		ug/L		94	69 - 125
Methyl tert-butyl ether	50.0	46.8		ug/L		94	55 - 123
Naphthalene	50.0	40.8		ug/L		82	53 - 144
n-Butylbenzene	50.0	48.4		ug/L		97	68 - 125
N-Propylbenzene	50.0	51.3		ug/L		103	69 - 127
p-Isopropyltoluene	50.0	47.9		ug/L		96	70 - 125
sec-Butylbenzene	50.0	48.7		ug/L		97	70 - 123
Styrene	50.0	52.5		ug/L		105	70 - 120
tert-Butylbenzene	50.0	49.0		ug/L		98	70 - 121
1,1,1,2-Tetrachloroethane	50.0	47.3		ug/L		95	70 - 125
1,1,2,2-Tetrachloroethane	50.0	53.0		ug/L		106	62 - 140
Tetrachloroethene	50.0	56.8		ug/L		114	70 - 128
Tetrahydrofuran	100	82.2		ug/L		82	59 - 139
Toluene	50.0	51.2		ug/L		102	70 - 125
trans-1,2-Dichloroethene	50.0	48.9		ug/L		98	70 - 125
trans-1,3-Dichloropropene	50.0	53.0		ug/L		106	62 - 128
1,2,3-Trichlorobenzene	50.0	43.5		ug/L		87	51 - 145
1,2,4-Trichlorobenzene	50.0	46.3		ug/L		93	57 - 137
1,1,1-Trichloroethane	50.0	49.7		ug/L		99	70 - 125
1,1,2-Trichloroethane	50.0	54.0		ug/L		108	71 - 130
Trichloroethene	50.0	51.4		ug/L		103	70 - 125
Trichlorofluoromethane	50.0	44.6		ug/L		89	55 - 128
1,2,3-Trichloropropane	50.0	57.6		ug/L		115	50 - 133
1,2,4-Trimethylbenzene	50.0	49.6		ug/L		99	70 - 123
1,3,5-Trimethylbenzene	50.0	49.3		ug/L		99	70 - 123
Vinyl chloride	50.0	46.7		ug/L		93	64 - 126
Xylenes, Total	100	102		ug/L		102	70 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*104*		*72 - 124*
Dibromofluoromethane (Surr)	*98*		*75 - 120*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 126*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-706593/6
Matrix: Water
Analysis Batch: 706593

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	103		75 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 500-705758/1-A
Matrix: Water
Analysis Batch: 706031

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 705758

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		04/04/23 09:31	04/04/23 17:23	1
Arsenic	<0.23		1.0	0.23	ug/L		04/04/23 09:31	04/04/23 17:23	1
Barium	<0.73		2.5	0.73	ug/L		04/04/23 09:31	04/04/23 17:23	1
Beryllium	<0.53		1.0	0.53	ug/L		04/04/23 09:31	04/04/23 17:23	1
Boron	<12.7		50.0	12.7	ug/L		04/04/23 09:31	04/04/23 17:23	1
Cadmium	<0.17		0.50	0.17	ug/L		04/04/23 09:31	04/04/23 17:23	1
Chromium	<1.1		5.0	1.1	ug/L		04/04/23 09:31	04/04/23 17:23	1
Cobalt	<0.40		1.0	0.40	ug/L		04/04/23 09:31	04/04/23 17:23	1
Copper	<0.50		2.0	0.50	ug/L		04/04/23 09:31	04/04/23 17:23	1
Lead	<0.19		0.50	0.19	ug/L		04/04/23 09:31	04/04/23 17:23	1
Manganese	<0.79		2.5	0.79	ug/L		04/04/23 09:31	04/04/23 17:23	1
Nickel	<0.63		2.0	0.63	ug/L		04/04/23 09:31	04/04/23 17:23	1
Selenium	<0.98		2.5	0.98	ug/L		04/04/23 09:31	04/04/23 17:23	1
Silver	<0.12		0.50	0.12	ug/L		04/04/23 09:31	04/04/23 17:23	1
Thallium	<0.57		2.0	0.57	ug/L		04/04/23 09:31	04/04/23 17:23	1
Zinc	<6.9		20.0	6.9	ug/L		04/04/23 09:31	04/04/23 17:23	1

Lab Sample ID: MB 500-705758/1-A
Matrix: Water
Analysis Batch: 706109

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 705758

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		04/04/23 09:31	04/05/23 15:11	1
Arsenic	<0.23		1.0	0.23	ug/L		04/04/23 09:31	04/05/23 15:11	1
Barium	<0.73		2.5	0.73	ug/L		04/04/23 09:31	04/05/23 15:11	1
Cadmium	<0.17		0.50	0.17	ug/L		04/04/23 09:31	04/05/23 15:11	1
Chromium	<1.1		5.0	1.1	ug/L		04/04/23 09:31	04/05/23 15:11	1
Cobalt	<0.40		1.0	0.40	ug/L		04/04/23 09:31	04/05/23 15:11	1
Copper	<0.50		2.0	0.50	ug/L		04/04/23 09:31	04/05/23 15:11	1
Lead	<0.19		0.50	0.19	ug/L		04/04/23 09:31	04/05/23 15:11	1
Manganese	<0.79		2.5	0.79	ug/L		04/04/23 09:31	04/05/23 15:11	1
Nickel	<0.63		2.0	0.63	ug/L		04/04/23 09:31	04/05/23 15:11	1
Selenium	<0.98		2.5	0.98	ug/L		04/04/23 09:31	04/05/23 15:11	1
Silver	<0.12		0.50	0.12	ug/L		04/04/23 09:31	04/05/23 15:11	1
Thallium	<0.57		2.0	0.57	ug/L		04/04/23 09:31	04/05/23 15:11	1
Vanadium	<2.2		5.0	2.2	ug/L		04/04/23 09:31	04/05/23 15:11	1
Zinc	<6.9		20.0	6.9	ug/L		04/04/23 09:31	04/05/23 15:11	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 500-705758/2-A
Matrix: Water
Analysis Batch: 706031

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 705758

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	500	512.7		ug/L		103	80 - 120
Arsenic	100	95.11		ug/L		95	80 - 120
Barium	500	525.5		ug/L		105	80 - 120
Beryllium	50.0	48.46		ug/L		97	80 - 120
Boron	1000	983.7		ug/L		98	80 - 120
Cadmium	50.0	50.01		ug/L		100	80 - 120
Chromium	200	206.5		ug/L		103	80 - 120
Cobalt	500	522.6		ug/L		105	80 - 120
Copper	250	261.5		ug/L		105	80 - 120
Lead	100	106.4		ug/L		106	80 - 120
Manganese	500	518.4		ug/L		104	80 - 120
Nickel	500	537.1		ug/L		107	80 - 120
Selenium	100	96.68		ug/L		97	80 - 120
Silver	50.0	49.09		ug/L		98	80 - 120
Thallium	100	107.1		ug/L		107	80 - 120
Zinc	500	514.9		ug/L		103	80 - 120

Lab Sample ID: LCS 500-705758/2-A
Matrix: Water
Analysis Batch: 706109

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 705758

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Vanadium	500	515.7		ug/L		103	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-705605/13-A
Matrix: Water
Analysis Batch: 705825

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 705605

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.079		0.20	0.079	ug/L		04/03/23 14:55	04/04/23 07:32	1

Lab Sample ID: LCS 500-705605/12-A
Matrix: Water
Analysis Batch: 705825

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 705605

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.98	1.91		ug/L		96	80 - 120

Lab Sample ID: 500-231307-1 MS
Matrix: Water
Analysis Batch: 705825

Client Sample ID: MW-17WT
Prep Type: Dissolved
Prep Batch: 705605

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.079		1.00	1.06		ug/L		106	75 - 125

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 500-231307-1 MSD
Matrix: Water
Analysis Batch: 705825

Client Sample ID: MW-17WT
Prep Type: Dissolved
Prep Batch: 705605

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	<0.079		1.00	1.06		ug/L		106	75 - 125	0	20

Lab Sample ID: 500-231307-1 DU
Matrix: Water
Analysis Batch: 705825

Client Sample ID: MW-17WT
Prep Type: Dissolved
Prep Batch: 705605

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Mercury	<0.079		<0.079		ug/L				NC	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-704802/11
Matrix: Water
Analysis Batch: 704802

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.12		1.0	0.12	mg/L			03/29/23 13:04	1
Fluoride	<0.19		1.0	0.19	mg/L			03/29/23 13:04	1
Sulfate	<0.21		1.0	0.21	mg/L			03/29/23 13:04	1

Lab Sample ID: LCS 500-704802/12
Matrix: Water
Analysis Batch: 704802

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			20.0	19.85		mg/L		99	90 - 110		
Fluoride			20.0	20.51		mg/L		103	90 - 110		
Sulfate			20.0	19.14		mg/L		96	90 - 110		

Method: N07-0003 - Enzymatic Nitrate-Nitrite Nitrogen

Lab Sample ID: MB 500-705529/77
Matrix: Water
Analysis Batch: 705529

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	<0.041		0.10	0.041	mg/L			04/03/23 09:58	1

Lab Sample ID: LCS 500-705529/79
Matrix: Water
Analysis Batch: 705529

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate Nitrite as N			1.00	1.03		mg/L		103	90 - 110		

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-231307-1

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-705443/29
Matrix: Water
Analysis Batch: 705443

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			03/30/23 15:13	1

Lab Sample ID: MB 500-705443/3
Matrix: Water
Analysis Batch: 705443

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			03/30/23 15:13	1

Lab Sample ID: LCS 500-705443/30
Matrix: Water
Analysis Batch: 705443

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Alkalinity			100	107.2		mg/L		107	90 - 110		

Lab Sample ID: LCS 500-705443/4
Matrix: Water
Analysis Batch: 705443

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Alkalinity			100	108.8		mg/L		109	90 - 110		

Lab Sample ID: 500-231307-1 DU
Matrix: Water
Analysis Batch: 705443

Client Sample ID: MW-17WT
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity	265			266.7		mg/L				0.6	20

Lab Chronicle

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill Expansion

Job ID: 500-231307-1

Client Sample ID: MW-17WT

Date Collected: 03/27/23 08:00
Date Received: 03/28/23 10:10

Lab Sample ID: 500-231307-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	706593	W1T	EET CHI	04/07/23 19:00
Dissolved	Prep	3005A			705758	BDE	EET CHI	04/04/23 09:31 - 04/04/23 10:01 [1]
Dissolved	Analysis	6020B		1	706031	FXG	EET CHI	04/04/23 18:34
Dissolved	Prep	3005A			705758	BDE	EET CHI	04/04/23 09:31 - 04/04/23 10:01 [1]
Dissolved	Analysis	6020B		1	706109	FXG	EET CHI	04/05/23 15:35
Dissolved	Prep	7470A			705605	MJG	EET CHI	04/03/23 14:55 - 04/03/23 16:55 [1]
Dissolved	Analysis	7470A		1	705825	MJG	EET CHI	04/04/23 07:45
Dissolved	Prep	3005A			705758	BDE	EET CHI	04/04/23 09:31 - 04/04/23 10:01 [1]
Dissolved	Analysis	SM 2340B		1	706114	FXG	EET CHI	04/05/23 16:24
Dissolved	Analysis	300.0		1	704802	EH	EET CHI	03/29/23 17:08
Dissolved	Analysis	N07-0003		1	705529	LP	EET CHI	04/03/23 10:06
Dissolved	Analysis	SM 2320B		1	705443	EH	EET CHI	03/30/23 15:13

Client Sample ID: MW-14WT

Date Collected: 03/27/23 10:00
Date Received: 03/28/23 10:10

Lab Sample ID: 500-231307-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	706593	W1T	EET CHI	04/07/23 19:23
Dissolved	Prep	3005A			705758	BDE	EET CHI	04/04/23 09:31 - 04/04/23 10:01 [1]
Dissolved	Analysis	6020B		1	706031	FXG	EET CHI	04/04/23 18:39
Dissolved	Prep	7470A			705605	MJG	EET CHI	04/03/23 14:55 - 04/03/23 16:55 [1]
Dissolved	Analysis	7470A		1	705825	MJG	EET CHI	04/04/23 08:25
Dissolved	Prep	3005A			705758	BDE	EET CHI	04/04/23 09:31 - 04/04/23 10:01 [1]
Dissolved	Analysis	SM 2340B		1	706114	FXG	EET CHI	04/05/23 16:24
Dissolved	Analysis	300.0		1	704802	EH	EET CHI	03/29/23 17:38
Dissolved	Analysis	N07-0003		1	705529	LP	EET CHI	04/03/23 10:06
Dissolved	Analysis	SM 2320B		1	705443	EH	EET CHI	03/30/23 15:13

Client Sample ID: MW-16

Date Collected: 03/27/23 12:00
Date Received: 03/28/23 10:10

Lab Sample ID: 500-231307-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	706593	W1T	EET CHI	04/07/23 19:46
Dissolved	Prep	3005A			705758	BDE	EET CHI	04/04/23 09:31 - 04/04/23 10:01 [1]
Dissolved	Analysis	6020B		1	706031	FXG	EET CHI	04/04/23 18:43
Dissolved	Prep	7470A			705605	MJG	EET CHI	04/03/23 14:55 - 04/03/23 16:55 [1]
Dissolved	Analysis	7470A		1	705825	MJG	EET CHI	04/04/23 08:27
Dissolved	Prep	3005A			705758	BDE	EET CHI	04/04/23 09:31 - 04/04/23 10:01 [1]
Dissolved	Analysis	SM 2340B		1	706114	FXG	EET CHI	04/05/23 16:24
Dissolved	Analysis	300.0		1	704802	EH	EET CHI	03/29/23 17:53
Dissolved	Analysis	N07-0003		1	705529	LP	EET CHI	04/03/23 10:08
Dissolved	Analysis	SM 2320B		1	705443	EH	EET CHI	03/30/23 15:13

Lab Chronicle

Client: Vernon County Solid Waste & Recycling
Job ID: 500-231307-1
Project/Site: Vernon County Landfill Expansion

[1] Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-231307-1
Project/Site: Vernon County Landfill Expansion

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999580010	08-31-23

	MW-14WT	MW-16	MW-17WT
Baseline/Detection			
Alkalinity	x	x	x
Chloride	x	x	x
Hardness	x	x	x
Field Cond (FIELD)	x	x	x
pH (FIELD)	x	x	x
Temp (FIELD)	x	x	x
Public Welfare			
Copper	x	x	x
Manganese	x	x	x
Sulfate	x	x	x
Zinc	x	x	x
Public Health			
Arsenic	x	x	x
Barium	x	x	x
Cadmium	x	x	x
Chromium	x	x	x
Flouride	x	x	x
Lead	x	x	x
Mercury	x	x	x
N+N	x	x	x
Selenium	x	x	x
Silver	x	x	x
Boron	x	x	x
Subtitle D Well Background			
Antimony			x
Beryllium			x
Cobalt			x
Nickel			x
Thalium			x
Vanadium			x
VOCs (8260)	x	x	x

Please Forward copy of Report to Brian Kent Veronica Arauela

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534 5211

Chain of Custody Record

500-231307 COC

Client Information Stacie Stanborn	Sampler: Veronica Arauela	Lab PM: Fredrick Sandie	Carrier Tracking No(s):	Page: Page 3 of 4
Client Contact: [redacted]	Phone: 715-933-235[illegible]	E-Mail: Sandra Fredrick@et eurofinsus com	State of Origin:	Job #: 500-231307
Company: [redacted] Vernon County Solid Waste & Recycling	PWSID:			
Address: [redacted]	Due Date Requested:			
City: [redacted]	TAT Requested (days):			
State, Zip: [redacted]	Compliance Project: Δ Yes Δ No			
Phone:	PO #: Purchase Order not required			
Email: [redacted]	WO #:			
Project Name: [redacted]	Project #: [redacted] 50020572			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4 5, Y Trizma, Z other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SM2340B Hardness Diss	2320B - Alk - Diss	300 Chloride Diss	8260B - VOC	6020A - Cu/Mn/Zn	300 - Sulfate	6020A 7470A As, Ba, Cd, Cr, Pb, Hg, Se, B, Fe	300 - Fluoride	353.2 N+N	6020A Sb/Be/Co/Ni/Tl/V	Total Number of containers	Special Instructions/Note
			Preservation Code:				D	N	N	A	D	N	D	N	S	D		
1 MW-17WT	3/27/23	800	G	Water			X	X	X	X	X	X	X	X	X	X		All samples field filtered except VOCs
2 MW-11WT	3/27/23	1000	G	Water			X	X	X	X	X	X	X	X	X			
3 MW-16	3/27/23	1200	G	Water			X	X	X	X	X	X	X	X	X			
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment: Fedex
Relinquished by: [signature]	Date/Time: 3/27/23	Company: ET Chi	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by [signature]	Date/Time 3/28/23 1010	Company

Custody Seals Intact: X Yes No
Custody Seal No: 1891055

Cooler Temperature(s) °C and Other Remarks: 2.2 - 2.1



500-231307 Waybi

ORIGIN ID:RRLA (262) 202-5955

STRESAU LAB
N8265 MEDLEY RD

SPOONER, WI 54801
UNITED STATES US

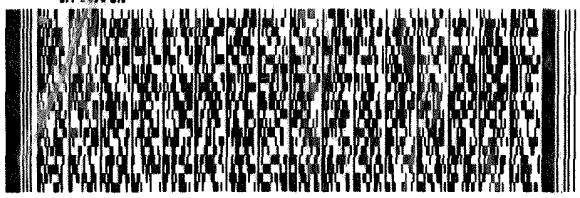
SHIP DATE: 15AUG22
ACTWGT: 25.00 LB MAN
CAD: 0269688/CAFE3511

TO **SAMPLE RECEIPT**
EUROFINS
2417 BOND ST.

UNIVERSITY PARK IL 60484

(262) 202-5955 REF:
INV:
PO: DEPT:

RMA:



FedEx Express

J211020121101uv

RETURNS MON-SAT
PRIORITY OVERNIGHT

TRK# 0221 **5887 6288 4070**

Login Sample Receipt Checklist

Client: Vernon County Solid Waste & Recycling

Job Number: 500-231307-1

Login Number: 231307
List Number: 1
Creator: James, Jeff A

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Stacie Sanborn
Vernon County Solid Waste & Recycling
S3705 County Road LF
Viroqua, Wisconsin 54665

Generated 5/21/2023 11:05:09 PM

JOB DESCRIPTION

Vernon County Landfill

JOB NUMBER

500-233069-1

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

Eurofins Chicago

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Authorization



Generated
5/21/2023 11:05:09 PM

Authorized for release by
Carlene McCutcheon, Senior Project Manager
Carlene.McCutcheon@et.eurofinsus.com
Designee for
Sandie Fredrick, Project Manager II
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

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Job ID: 500-233069-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-233069-1

Receipt
The samples were received on 4/29/2023 11:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.3º C.

GC/MS VOA
Method 8260B: Acetone was detected in the following samples: MW-17WT (500-233069-3) and Trip Blank (500-233069-4) Acetone is a known lab contaminant; therefore all low level detects for this compound could be suspected as lab contamination.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
Method 6020B: The continuing calibration verification (CCV) at line 24, was outside the control limits for Beryllium and Boron bracketing the method blank (MB) and laboratory control sample (LCS). The MB and LCS were within the method control limits. The associated samples were bracketed by CCV that were within control limits for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Field Service / Mobile Lab
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-233069-1
Project/Site: Vernon County Landfill

Client Sample ID: MW-14WT
Lab Sample ID: 500-233069-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.44	J	1.0	0.23	ug/L	1		6020B	Dissolved
Manganese	120		2.5	0.79	ug/L	1		6020B	Dissolved
Hardness as calcium carbonate	246		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	6.0		1.0	0.12	mg/L	1		300.0	Dissolved
Fluoride	0.23	J	1.0	0.19	mg/L	1		300.0	Dissolved
Sulfate	4.5		1.0	0.21	mg/L	1		300.0	Dissolved
Alkalinity	235		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: MW-16
Lab Sample ID: 500-233069-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Hardness as calcium carbonate	383		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	4.2		1.0	0.12	mg/L	1		300.0	Dissolved
Fluoride	0.20	J	1.0	0.19	mg/L	1		300.0	Dissolved
Sulfate	10.3		1.0	0.21	mg/L	1		300.0	Dissolved
Alkalinity	349		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: MW-17WT
Lab Sample ID: 500-233069-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Acetone	8.0	J	10	1.7	ug/L	1		8260B	Total/NA
Arsenic	0.49	J	1.0	0.23	ug/L	1		6020B	Dissolved
Barium	33.0	B	2.5	0.73	ug/L	1		6020B	Dissolved
Copper	1.6	J B	2.0	0.50	ug/L	1		6020B	Dissolved
Manganese	28.4		2.5	0.79	ug/L	1		6020B	Dissolved
Nickel	1.4	J	2.0	0.63	ug/L	1		6020B	Dissolved
Hardness as calcium carbonate	267		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	4.5		1.0	0.12	mg/L	1		300.0	Dissolved
Fluoride	0.22	J	1.0	0.19	mg/L	1		300.0	Dissolved
Sulfate	5.8		1.0	0.21	mg/L	1		300.0	Dissolved
Nitrate Nitrite as N	0.20		0.10	0.041	mg/L	1		N07-0003	Dissolved
Alkalinity	269		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: Trip Blank
Lab Sample ID: 500-233069-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Acetone	6.9	J	10	1.7	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill

Job ID: 500-233069-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	EET CHI
6020B	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	EET CHI
300.0	Anions, Ion Chromatography	EPA	EET CHI
N07-0003	Enzymatic Nitrate-Nitrite Nitrogen	EPA	EET CHI
SM 2320B	Alkalinity	SM	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
5030B	Purge and Trap	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill

Job ID: 500-233069-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-233069-1	MW-14WT	Water	04/28/23 08:00	04/29/23 11:40
500-233069-2	MW-16	Water	04/28/23 09:00	04/29/23 11:40
500-233069-3	MW-17WT	Water	04/28/23 10:00	04/29/23 11:40
500-233069-4	Trip Blank	Water	04/28/23 00:00	04/29/23 11:40

Client Sample Results

Client: Vernon County Solid Waste & Recycling
Job ID: 500-233069-1
Project/Site: Vernon County Landfill

Client Sample ID: MW-14WT
Lab Sample ID: 500-233069-1

Date Collected: 04/28/23 08:00
Matrix: Water
Date Received: 04/29/23 11:40

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.44**	**J**	1.0	0.23	ug/L		05/11/23 09:42	05/12/23 16:15	1
Beryllium	<0.53		1.0	0.53	ug/L		05/11/23 09:42	05/11/23 21:44	1
Chromium	<1.1		5.0	1.1	ug/L		05/11/23 09:42	05/11/23 21:44	1
Lead	<0.19		0.50	0.19	ug/L		05/11/23 09:42	05/11/23 21:44	1
Manganese	**120**		2.5	0.79	ug/L		05/11/23 09:42	05/12/23 16:15	1
Vanadium	<2.2		5.0	2.2	ug/L		05/11/23 09:42	05/12/23 16:15	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**246**		0.91	0.46	mg/L		05/11/23 09:42	05/15/23 10:24	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	**6.0**		1.0	0.12	mg/L			05/18/23 22:37	1
Fluoride (EPA 300.0)	**0.23**	**J**	1.0	0.19	mg/L			05/18/23 22:37	1
Sulfate (EPA 300.0)	**4.5**		1.0	0.21	mg/L			05/19/23 12:09	1
Alkalinity (SM 2320B)	**235**		5.0	3.7	mg/L			05/10/23 16:38	1

Client Sample Results

Client: Vernon County Solid Waste & Recycling
Job ID: 500-233069-1
Project/Site: Vernon County Landfill

Client Sample ID: MW-16
Lab Sample ID: 500-233069-2

Date Collected: 04/28/23 09:00
Matrix: Water

Date Received: 04/29/23 11:40

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	383		0.91	0.46	mg/L		05/11/23 09:42	05/15/23 10:24	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	4.2		1.0	0.12	mg/L			05/18/23 22:53	1
Fluoride (EPA 300.0)	0.20	J	1.0	0.19	mg/L			05/18/23 22:53	1
Sulfate (EPA 300.0)	10.3		1.0	0.21	mg/L			05/19/23 12:24	1
Alkalinity (SM 2320B)	349		5.0	3.7	mg/L			05/10/23 16:38	1

Client Sample ID: MW-17WT
Lab Sample ID: 500-233069-3

Date Collected: 04/28/23 10:00
Matrix: Water
Date Received: 04/29/23 11:40

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**8.0**	**J**	10	1.7	ug/L			05/10/23 02:39	1
Benzene	<0.15		0.50	0.15	ug/L			05/10/23 02:39	1
Bromobenzene	<0.36		1.0	0.36	ug/L			05/10/23 02:39	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			05/10/23 02:39	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			05/10/23 02:39	1
Bromoform	<0.48		1.0	0.48	ug/L			05/10/23 02:39	1
Bromomethane	<0.80		3.0	0.80	ug/L			05/10/23 02:39	1
2-Butanone (MEK)	<2.1		5.0	2.1	ug/L			05/10/23 02:39	1
Carbon disulfide	<0.45		2.0	0.45	ug/L			05/10/23 02:39	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			05/10/23 02:39	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			05/10/23 02:39	1
Chloroethane	<0.51		1.0	0.51	ug/L			05/10/23 02:39	1
Chloroform	<0.37		2.0	0.37	ug/L			05/10/23 02:39	1
Chloromethane	<0.32		1.0	0.32	ug/L			05/10/23 02:39	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			05/10/23 02:39	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			05/10/23 02:39	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			05/10/23 02:39	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			05/10/23 02:39	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			05/10/23 02:39	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			05/10/23 02:39	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			05/10/23 02:39	1
Dibromomethane	<0.27		1.0	0.27	ug/L			05/10/23 02:39	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			05/10/23 02:39	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			05/10/23 02:39	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			05/10/23 02:39	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			05/10/23 02:39	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			05/10/23 02:39	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			05/10/23 02:39	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			05/10/23 02:39	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			05/10/23 02:39	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			05/10/23 02:39	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			05/10/23 02:39	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			05/10/23 02:39	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			05/10/23 02:39	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			05/10/23 02:39	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			05/10/23 02:39	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			05/10/23 02:39	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			05/10/23 02:39	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			05/10/23 02:39	1
Naphthalene	<0.34		1.0	0.34	ug/L			05/10/23 02:39	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			05/10/23 02:39	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			05/10/23 02:39	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			05/10/23 02:39	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			05/10/23 02:39	1
Styrene	<0.39		1.0	0.39	ug/L			05/10/23 02:39	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			05/10/23 02:39	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			05/10/23 02:39	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			05/10/23 02:39	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			05/10/23 02:39	1

Client Sample ID: MW-17WT
Lab Sample ID: 500-233069-3

Date Collected: 04/28/23 10:00
Matrix: Water
Date Received: 04/29/23 11:40

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<1.9		10	1.9	ug/L			05/10/23 02:39	1
Toluene	<0.15		0.50	0.15	ug/L			05/10/23 02:39	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			05/10/23 02:39	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			05/10/23 02:39	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			05/10/23 02:39	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			05/10/23 02:39	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			05/10/23 02:39	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			05/10/23 02:39	1
Trichloroethene	<0.16		0.50	0.16	ug/L			05/10/23 02:39	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			05/10/23 02:39	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			05/10/23 02:39	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			05/10/23 02:39	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			05/10/23 02:39	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			05/10/23 02:39	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			05/10/23 02:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*106*		*72 - 124*		*05/10/23 02:39*	*1*
Dibromofluoromethane (Surr)	*95*		*75 - 120*		*05/10/23 02:39*	*1*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 126*		*05/10/23 02:39*	*1*
Toluene-d8 (Surr)	*92*		*75 - 120*		*05/10/23 02:39*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		05/11/23 09:42	05/12/23 16:22	1
Arsenic	**0.49**	**J**	1.0	0.23	ug/L		05/11/23 09:42	05/12/23 16:22	1
Barium	**33.0**	**B**	2.5	0.73	ug/L		05/11/23 09:42	05/11/23 21:51	1
Beryllium	<0.53		1.0	0.53	ug/L		05/11/23 09:42	05/11/23 21:51	1
Boron	<12.7		50.0	12.7	ug/L		05/11/23 09:42	05/11/23 21:51	1
Cadmium	<0.17		0.50	0.17	ug/L		05/11/23 09:42	05/11/23 21:51	1
Chromium	<1.1		5.0	1.1	ug/L		05/11/23 09:42	05/11/23 21:51	1
Cobalt	<0.40		1.0	0.40	ug/L		05/11/23 09:42	05/11/23 21:51	1
Copper	**1.6**	**J B**	2.0	0.50	ug/L		05/11/23 09:42	05/11/23 21:51	1
Lead	<0.19		0.50	0.19	ug/L		05/11/23 09:42	05/11/23 21:51	1
Manganese	**28.4**		2.5	0.79	ug/L		05/11/23 09:42	05/12/23 16:22	1
Nickel	**1.4**	**J**	2.0	0.63	ug/L		05/11/23 09:42	05/11/23 21:51	1
Selenium	<0.98		2.5	0.98	ug/L		05/11/23 09:42	05/11/23 21:51	1
Silver	<0.12		0.50	0.12	ug/L		05/11/23 09:42	05/11/23 21:51	1
Thallium	<0.57		2.0	0.57	ug/L		05/11/23 09:42	05/11/23 21:51	1
Vanadium	<2.2		5.0	2.2	ug/L		05/11/23 09:42	05/12/23 16:22	1
Zinc	<6.9		20.0	6.9	ug/L		05/11/23 09:42	05/11/23 21:51	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.079		0.20	0.079	ug/L		05/12/23 10:50	05/15/23 09:20	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**267**		0.91	0.46	mg/L		05/11/23 09:42	05/15/23 10:24	1

Client Sample Results

Client: Vernon County Solid Waste & Recycling
Job ID: 500-233069-1
Project/Site: Vernon County Landfill

Client Sample ID: MW-17WT
Lab Sample ID: 500-233069-3
Date Collected: 04/28/23 10:00
Matrix: Water
Date Received: 04/29/23 11:40

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	4.5		1.0	0.12	mg/L			05/18/23 23:09	1
Fluoride (EPA 300.0)	0.22	J	1.0	0.19	mg/L			05/18/23 23:09	1
Sulfate (EPA 300.0)	5.8		1.0	0.21	mg/L			05/19/23 12:39	1
Nitrate Nitrite as N (EPA N07-0003)	0.20		0.10	0.041	mg/L			05/17/23 10:47	1
Alkalinity (SM 2320B)	269		5.0	3.7	mg/L			05/10/23 16:38	1

Client: Vernon County Solid Waste & Recycling
Job ID: 500-233069-1
Project/Site: Vernon County Landfill

Client Sample ID: Trip Blank
Lab Sample ID: 500-233069-4

Date Collected: 04/28/23 00:00
Matrix: Water
Date Received: 04/29/23 11:40

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	6.9	J	10	1.7	ug/L			05/10/23 01:25	1
Benzene	<0.15		0.50	0.15	ug/L			05/10/23 01:25	1
Bromobenzene	<0.36		1.0	0.36	ug/L			05/10/23 01:25	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			05/10/23 01:25	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			05/10/23 01:25	1
Bromoform	<0.48		1.0	0.48	ug/L			05/10/23 01:25	1
Bromomethane	<0.80		3.0	0.80	ug/L			05/10/23 01:25	1
2-Butanone (MEK)	<2.1		5.0	2.1	ug/L			05/10/23 01:25	1
Carbon disulfide	<0.45		2.0	0.45	ug/L			05/10/23 01:25	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			05/10/23 01:25	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			05/10/23 01:25	1
Chloroethane	<0.51		1.0	0.51	ug/L			05/10/23 01:25	1
Chloroform	<0.37		2.0	0.37	ug/L			05/10/23 01:25	1
Chloromethane	<0.32		1.0	0.32	ug/L			05/10/23 01:25	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			05/10/23 01:25	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			05/10/23 01:25	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			05/10/23 01:25	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			05/10/23 01:25	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			05/10/23 01:25	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			05/10/23 01:25	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			05/10/23 01:25	1
Dibromomethane	<0.27		1.0	0.27	ug/L			05/10/23 01:25	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			05/10/23 01:25	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			05/10/23 01:25	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			05/10/23 01:25	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			05/10/23 01:25	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			05/10/23 01:25	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			05/10/23 01:25	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			05/10/23 01:25	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			05/10/23 01:25	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			05/10/23 01:25	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			05/10/23 01:25	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			05/10/23 01:25	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			05/10/23 01:25	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			05/10/23 01:25	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			05/10/23 01:25	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			05/10/23 01:25	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			05/10/23 01:25	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			05/10/23 01:25	1
Naphthalene	<0.34		1.0	0.34	ug/L			05/10/23 01:25	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			05/10/23 01:25	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			05/10/23 01:25	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			05/10/23 01:25	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			05/10/23 01:25	1
Styrene	<0.39		1.0	0.39	ug/L			05/10/23 01:25	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			05/10/23 01:25	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			05/10/23 01:25	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			05/10/23 01:25	1
Tetrachloroethene	<0.37		1.0	0.37	ug/L			05/10/23 01:25	1

Client: Vernon County Solid Waste & Recycling
Job ID: 500-233069-1
Project/Site: Vernon County Landfill

Client Sample ID: Trip Blank
Lab Sample ID: 500-233069-4
Date Collected: 04/28/23 00:00
Matrix: Water
Date Received: 04/29/23 11:40

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Tetrahydrofuran	<1.9		10	1.9	ug/L			05/10/23 01:25	1
Toluene	<0.15		0.50	0.15	ug/L			05/10/23 01:25	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			05/10/23 01:25	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			05/10/23 01:25	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			05/10/23 01:25	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			05/10/23 01:25	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			05/10/23 01:25	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			05/10/23 01:25	1
Trichloroethene	<0.16		0.50	0.16	ug/L			05/10/23 01:25	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			05/10/23 01:25	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			05/10/23 01:25	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			05/10/23 01:25	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			05/10/23 01:25	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			05/10/23 01:25	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			05/10/23 01:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*106*		*72 - 124*		*05/10/23 01:25*	*1*
Dibromofluoromethane (Surr)	*92*		*75 - 120*		*05/10/23 01:25*	*1*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 126*		*05/10/23 01:25*	*1*
Toluene-d8 (Surr)	*94*		*75 - 120*		*05/10/23 01:25*	*1*

Definitions/Glossary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-233069-1
Project/Site: Vernon County Landfill

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
B	Compound was found in the blank and sample.
J	Reported value was between the limit of detection and the limit of quantitation.

General Chemistry

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

GC/MS VOA

Analysis Batch: 712311

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233069-3	MW-17WT	Total/NA	Water	8260B	
500-233069-4	Trip Blank	Total/NA	Water	8260B	
MB 500-712311/7	Method Blank	Total/NA	Water	8260B	
LCS 500-712311/5	Lab Control Sample	Total/NA	Water	8260B	

Metals

Prep Batch: 712697

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233069-1	MW-14WT	Dissolved	Water	3005A	
500-233069-2	MW-16	Dissolved	Water	3005A	
500-233069-3	MW-17WT	Dissolved	Water	3005A	
MB 500-712697/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-712697/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 712962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233069-1	MW-14WT	Dissolved	Water	6020B	712697
500-233069-3	MW-17WT	Dissolved	Water	6020B	712697
MB 500-712697/1-A	Method Blank	Total Recoverable	Water	6020B	712697
LCS 500-712697/2-A	Lab Control Sample	Total Recoverable	Water	6020B	712697

Prep Batch: 712983

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233069-3	MW-17WT	Dissolved	Water	7470A	
MB 500-712983/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-712983/13-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 713284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233069-1	MW-14WT	Dissolved	Water	6020B	712697
500-233069-3	MW-17WT	Dissolved	Water	6020B	712697
MB 500-712697/1-A	Method Blank	Total Recoverable	Water	6020B	712697
LCS 500-712697/2-A	Lab Control Sample	Total Recoverable	Water	6020B	712697

Analysis Batch: 713285

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233069-1	MW-14WT	Dissolved	Water	SM 2340B	712697
500-233069-2	MW-16	Dissolved	Water	SM 2340B	712697
500-233069-3	MW-17WT	Dissolved	Water	SM 2340B	712697

Analysis Batch: 713303

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233069-3	MW-17WT	Dissolved	Water	7470A	712983
MB 500-712983/12-A	Method Blank	Total/NA	Water	7470A	712983
LCS 500-712983/13-A	Lab Control Sample	Total/NA	Water	7470A	712983

General Chemistry

Analysis Batch: 712631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233069-1	MW-14WT	Dissolved	Water	SM 2320B	

General Chemistry (Continued)

Analysis Batch: 712631 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233069-2	MW-16	Dissolved	Water	SM 2320B	
500-233069-3	MW-17WT	Dissolved	Water	SM 2320B	
MB 500-712631/28	Method Blank	Total/NA	Water	SM 2320B	
MB 500-712631/53	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-712631/29	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 500-712631/54	Lab Control Sample	Total/NA	Water	SM 2320B	
500-233069-1 DU	MW-14WT	Dissolved	Water	SM 2320B	

Analysis Batch: 713788

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233069-3	MW-17WT	Dissolved	Water	N07-0003	
MB 500-713788/40	Method Blank	Total/NA	Water	N07-0003	
LCS 500-713788/41	Lab Control Sample	Total/NA	Water	N07-0003	
500-233069-3 MS	MW-17WT	Dissolved	Water	N07-0003	
500-233069-3 MSD	MW-17WT	Dissolved	Water	N07-0003	

Analysis Batch: 714037

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233069-1	MW-14WT	Dissolved	Water	300.0	
500-233069-2	MW-16	Dissolved	Water	300.0	
500-233069-3	MW-17WT	Dissolved	Water	300.0	
MB 500-714037/33	Method Blank	Total/NA	Water	300.0	
LCS 500-714037/36	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 714280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233069-1	MW-14WT	Dissolved	Water	300.0	
500-233069-2	MW-16	Dissolved	Water	300.0	
500-233069-3	MW-17WT	Dissolved	Water	300.0	
MB 500-714280/3	Method Blank	Total/NA	Water	300.0	
LCS 500-714280/4	Lab Control Sample	Total/NA	Water	300.0	

Surrogate Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill

Job ID: 500-233069-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	DBFM	DCA	TOL
Lab Sample ID	Client Sample ID	(72-124)	(75-120)	(75-126)	(75-120)
500-233069-3	MW-17WT	106	95	107	92
500-233069-4	Trip Blank	106	92	105	94
LCS 500-712311/5	Lab Control Sample	107	98	104	94
MB 500-712311/7	Method Blank	112	94	108	94

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-712311/7
Matrix: Water
Analysis Batch: 712311

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<1.7		10	1.7	ug/L			05/10/23 00:36	1
Benzene	<0.15		0.50	0.15	ug/L			05/10/23 00:36	1
Bromobenzene	<0.36		1.0	0.36	ug/L			05/10/23 00:36	1
Bromochloromethane	<0.43		1.0	0.43	ug/L			05/10/23 00:36	1
Bromodichloromethane	<0.37		1.0	0.37	ug/L			05/10/23 00:36	1
Bromoform	<0.48		1.0	0.48	ug/L			05/10/23 00:36	1
Bromomethane	<0.80		3.0	0.80	ug/L			05/10/23 00:36	1
2-Butanone (MEK)	<2.1		5.0	2.1	ug/L			05/10/23 00:36	1
Carbon disulfide	<0.45		2.0	0.45	ug/L			05/10/23 00:36	1
Carbon tetrachloride	<0.38		1.0	0.38	ug/L			05/10/23 00:36	1
Chlorobenzene	<0.39		1.0	0.39	ug/L			05/10/23 00:36	1
Chloroethane	<0.51		1.0	0.51	ug/L			05/10/23 00:36	1
Chloroform	<0.37		2.0	0.37	ug/L			05/10/23 00:36	1
Chloromethane	<0.32		1.0	0.32	ug/L			05/10/23 00:36	1
2-Chlorotoluene	<0.31		1.0	0.31	ug/L			05/10/23 00:36	1
4-Chlorotoluene	<0.35		1.0	0.35	ug/L			05/10/23 00:36	1
cis-1,2-Dichloroethene	<0.41		1.0	0.41	ug/L			05/10/23 00:36	1
cis-1,3-Dichloropropene	<0.42		1.0	0.42	ug/L			05/10/23 00:36	1
Dibromochloromethane	<0.49		1.0	0.49	ug/L			05/10/23 00:36	1
1,2-Dibromo-3-Chloropropane	<2.0		5.0	2.0	ug/L			05/10/23 00:36	1
1,2-Dibromoethane	<0.39		1.0	0.39	ug/L			05/10/23 00:36	1
Dibromomethane	<0.27		1.0	0.27	ug/L			05/10/23 00:36	1
1,2-Dichlorobenzene	<0.33		1.0	0.33	ug/L			05/10/23 00:36	1
1,3-Dichlorobenzene	<0.40		1.0	0.40	ug/L			05/10/23 00:36	1
1,4-Dichlorobenzene	<0.36		1.0	0.36	ug/L			05/10/23 00:36	1
Dichlorodifluoromethane	<0.67		3.0	0.67	ug/L			05/10/23 00:36	1
1,1-Dichloroethane	<0.41		1.0	0.41	ug/L			05/10/23 00:36	1
1,2-Dichloroethane	<0.39		1.0	0.39	ug/L			05/10/23 00:36	1
1,1-Dichloroethene	<0.39		1.0	0.39	ug/L			05/10/23 00:36	1
1,2-Dichloropropane	<0.43		1.0	0.43	ug/L			05/10/23 00:36	1
1,3-Dichloropropane	<0.36		1.0	0.36	ug/L			05/10/23 00:36	1
2,2-Dichloropropane	<0.44		1.0	0.44	ug/L			05/10/23 00:36	1
1,1-Dichloropropene	<0.30		1.0	0.30	ug/L			05/10/23 00:36	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			05/10/23 00:36	1
Hexachlorobutadiene	<0.45		1.0	0.45	ug/L			05/10/23 00:36	1
Isopropylbenzene	<0.39		1.0	0.39	ug/L			05/10/23 00:36	1
Isopropyl ether	<0.28		1.0	0.28	ug/L			05/10/23 00:36	1
Methylene Chloride	<1.6		5.0	1.6	ug/L			05/10/23 00:36	1
Methyl tert-butyl ether	<0.39		1.0	0.39	ug/L			05/10/23 00:36	1
Naphthalene	<0.34		1.0	0.34	ug/L			05/10/23 00:36	1
n-Butylbenzene	<0.39		1.0	0.39	ug/L			05/10/23 00:36	1
N-Propylbenzene	<0.41		1.0	0.41	ug/L			05/10/23 00:36	1
p-Isopropyltoluene	<0.36		1.0	0.36	ug/L			05/10/23 00:36	1
sec-Butylbenzene	<0.40		1.0	0.40	ug/L			05/10/23 00:36	1
Styrene	<0.39		1.0	0.39	ug/L			05/10/23 00:36	1
tert-Butylbenzene	<0.40		1.0	0.40	ug/L			05/10/23 00:36	1
1,1,1,2-Tetrachloroethane	<0.46		1.0	0.46	ug/L			05/10/23 00:36	1
1,1,2,2-Tetrachloroethane	<0.40		1.0	0.40	ug/L			05/10/23 00:36	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 500-712311/7
Matrix: Water
Analysis Batch: 712311

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	<0.37		1.0	0.37	ug/L			05/10/23 00:36	1
Tetrahydrofuran	<1.9		10	1.9	ug/L			05/10/23 00:36	1
Toluene	<0.15		0.50	0.15	ug/L			05/10/23 00:36	1
trans-1,2-Dichloroethene	<0.35		1.0	0.35	ug/L			05/10/23 00:36	1
trans-1,3-Dichloropropene	<0.36		1.0	0.36	ug/L			05/10/23 00:36	1
1,2,3-Trichlorobenzene	<0.46		1.0	0.46	ug/L			05/10/23 00:36	1
1,2,4-Trichlorobenzene	<0.34		1.0	0.34	ug/L			05/10/23 00:36	1
1,1,1-Trichloroethane	<0.38		1.0	0.38	ug/L			05/10/23 00:36	1
1,1,2-Trichloroethane	<0.35		1.0	0.35	ug/L			05/10/23 00:36	1
Trichloroethene	<0.16		0.50	0.16	ug/L			05/10/23 00:36	1
Trichlorofluoromethane	<0.43		1.0	0.43	ug/L			05/10/23 00:36	1
1,2,3-Trichloropropane	<0.41		2.0	0.41	ug/L			05/10/23 00:36	1
1,2,4-Trimethylbenzene	<0.36		1.0	0.36	ug/L			05/10/23 00:36	1
1,3,5-Trimethylbenzene	<0.25		1.0	0.25	ug/L			05/10/23 00:36	1
Vinyl chloride	<0.20		1.0	0.20	ug/L			05/10/23 00:36	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			05/10/23 00:36	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*112*		*72 - 124*		*05/10/23 00:36*	*1*
Dibromofluoromethane (Surr)	*94*		*75 - 120*		*05/10/23 00:36*	*1*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 126*		*05/10/23 00:36*	*1*
Toluene-d8 (Surr)	*94*		*75 - 120*		*05/10/23 00:36*	*1*

Lab Sample ID: LCS 500-712311/5
Matrix: Water
Analysis Batch: 712311

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	50.0	47.7		ug/L		95	40 - 143
Benzene	50.0	44.9		ug/L		90	70 - 120
Bromobenzene	50.0	47.9		ug/L		96	70 - 122
Bromochloromethane	50.0	44.2		ug/L		88	65 - 122
Bromodichloromethane	50.0	44.8		ug/L		90	69 - 120
Bromoform	50.0	37.1		ug/L		74	56 - 132
Bromomethane	50.0	51.2		ug/L		102	40 - 152
2-Butanone (MEK)	50.0	48.6		ug/L		97	46 - 144
Carbon disulfide	50.0	40.3		ug/L		81	66 - 120
Carbon tetrachloride	50.0	47.7		ug/L		95	59 - 133
Chlorobenzene	50.0	47.9		ug/L		96	70 - 120
Chloroethane	50.0	53.1		ug/L		106	48 - 136
Chloroform	50.0	49.0		ug/L		98	70 - 120
Chloromethane	50.0	46.6		ug/L		93	56 - 152
2-Chlorotoluene	50.0	48.3		ug/L		97	70 - 125
4-Chlorotoluene	50.0	49.8		ug/L		100	68 - 124
cis-1,2-Dichloroethene	50.0	44.5		ug/L		89	70 - 125
cis-1,3-Dichloropropene	50.0	44.3		ug/L		89	64 - 127
Dibromochloromethane	50.0	40.8		ug/L		82	68 - 125
1,2-Dibromo-3-Chloropropane	50.0	37.8		ug/L		76	56 - 123

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-712311/5
Matrix: Water
Analysis Batch: 712311

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2-Dibromoethane	50.0	46.5		ug/L		93	70 - 125
Dibromomethane	50.0	44.3		ug/L		89	70 - 120
1,2-Dichlorobenzene	50.0	45.8		ug/L		92	70 - 125
1,3-Dichlorobenzene	50.0	46.3		ug/L		93	70 - 125
1,4-Dichlorobenzene	50.0	45.5		ug/L		91	70 - 120
Dichlorodifluoromethane	50.0	50.9		ug/L		102	40 - 159
1,1-Dichloroethane	50.0	46.3		ug/L		93	70 - 125
1,2-Dichloroethane	50.0	50.1		ug/L		100	68 - 127
1,1-Dichloroethene	50.0	44.4		ug/L		89	67 - 122
1,2-Dichloropropane	50.0	47.1		ug/L		94	67 - 130
1,3-Dichloropropane	50.0	48.5		ug/L		97	62 - 136
2,2-Dichloropropane	50.0	48.0		ug/L		96	58 - 139
1,1-Dichloropropene	50.0	47.2		ug/L		94	70 - 121
Ethylbenzene	50.0	46.3		ug/L		93	70 - 123
Hexachlorobutadiene	50.0	46.2		ug/L		92	51 - 150
Isopropylbenzene	50.0	49.2		ug/L		98	70 - 126
Methylene Chloride	50.0	43.9		ug/L		88	69 - 125
Methyl tert-butyl ether	50.0	52.5		ug/L		105	55 - 123
Naphthalene	50.0	48.3		ug/L		97	53 - 144
n-Butylbenzene	50.0	46.5		ug/L		93	68 - 125
N-Propylbenzene	50.0	48.2		ug/L		96	69 - 127
p-Isopropyltoluene	50.0	48.6		ug/L		97	70 - 125
sec-Butylbenzene	50.0	48.8		ug/L		98	70 - 123
Styrene	50.0	47.4		ug/L		95	70 - 120
tert-Butylbenzene	50.0	47.9		ug/L		96	70 - 121
1,1,1,2-Tetrachloroethane	50.0	42.4		ug/L		85	70 - 125
1,1,2,2-Tetrachloroethane	50.0	50.2		ug/L		100	62 - 140
Tetrachloroethene	50.0	46.7		ug/L		93	70 - 128
Tetrahydrofuran	100	93.2		ug/L		93	59 - 139
Toluene	50.0	46.7		ug/L		93	70 - 125
trans-1,2-Dichloroethene	50.0	44.8		ug/L		90	70 - 125
trans-1,3-Dichloropropene	50.0	44.5		ug/L		89	62 - 128
1,2,3-Trichlorobenzene	50.0	45.1		ug/L		90	51 - 145
1,2,4-Trichlorobenzene	50.0	47.3		ug/L		95	57 - 137
1,1,1-Trichloroethane	50.0	48.7		ug/L		97	70 - 125
1,1,2-Trichloroethane	50.0	49.1		ug/L		98	71 - 130
Trichloroethene	50.0	46.3		ug/L		93	70 - 125
Trichlorofluoromethane	50.0	54.9		ug/L		110	55 - 128
1,2,3-Trichloropropane	50.0	49.3		ug/L		99	50 - 133
1,2,4-Trimethylbenzene	50.0	49.4		ug/L		99	70 - 123
1,3,5-Trimethylbenzene	50.0	49.8		ug/L		100	70 - 123
Vinyl chloride	50.0	55.9		ug/L		112	64 - 126
Xylenes, Total	100	92.9		ug/L		93	70 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*107*		*72 - 124*
Dibromofluoromethane (Surr)	*98*		*75 - 120*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 126*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-712311/5
Matrix: Water
Analysis Batch: 712311

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	94		75 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 500-712697/1-A
Matrix: Water
Analysis Batch: 712962

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 712697

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Barium	2.99		2.5	0.73	ug/L		05/11/23 09:42	05/11/23 20:15	1
Beryllium	<0.53		1.0	0.53	ug/L		05/11/23 09:42	05/11/23 20:15	1
Boron	<12.7		50.0	12.7	ug/L		05/11/23 09:42	05/11/23 20:15	1
Cadmium	<0.17		0.50	0.17	ug/L		05/11/23 09:42	05/11/23 20:15	1
Chromium	<1.1		5.0	1.1	ug/L		05/11/23 09:42	05/11/23 20:15	1
Cobalt	<0.40		1.0	0.40	ug/L		05/11/23 09:42	05/11/23 20:15	1
Copper	0.844	J	2.0	0.50	ug/L		05/11/23 09:42	05/11/23 20:15	1
Lead	<0.19		0.50	0.19	ug/L		05/11/23 09:42	05/11/23 20:15	1
Nickel	<0.63		2.0	0.63	ug/L		05/11/23 09:42	05/11/23 20:15	1
Selenium	<0.98		2.5	0.98	ug/L		05/11/23 09:42	05/11/23 20:15	1
Silver	<0.12		0.50	0.12	ug/L		05/11/23 09:42	05/11/23 20:15	1
Thallium	<0.57		2.0	0.57	ug/L		05/11/23 09:42	05/11/23 20:15	1
Zinc	<6.9		20.0	6.9	ug/L		05/11/23 09:42	05/11/23 20:15	1

Lab Sample ID: MB 500-712697/1-A
Matrix: Water
Analysis Batch: 713284

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 712697

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.3		3.0	1.3	ug/L		05/11/23 09:42	05/12/23 14:22	1
Arsenic	<0.23		1.0	0.23	ug/L		05/11/23 09:42	05/12/23 14:22	1
Manganese	<0.79		2.5	0.79	ug/L		05/11/23 09:42	05/12/23 14:22	1
Vanadium	<2.2		5.0	2.2	ug/L		05/11/23 09:42	05/12/23 14:22	1

Lab Sample ID: LCS 500-712697/2-A
Matrix: Water
Analysis Batch: 712962

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 712697

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	500	489.0		ug/L		98	80 - 120
Beryllium	50.0	49.49	^	ug/L		99	80 - 120
Boron	1000	1008	^	ug/L		101	80 - 120
Cadmium	50.0	49.03		ug/L		98	80 - 120
Chromium	200	197.7		ug/L		99	80 - 120
Cobalt	500	489.0		ug/L		98	80 - 120
Copper	250	247.9		ug/L		99	80 - 120
Lead	100	98.55		ug/L		99	80 - 120
Nickel	500	511.2		ug/L		102	80 - 120
Selenium	100	95.07		ug/L		95	80 - 120
Silver	50.0	49.72		ug/L		99	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 500-712697/2-A
Matrix: Water
Analysis Batch: 712962

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 712697

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Thallium	100	100.4		ug/L		100	80 - 120
Zinc	500	504.5		ug/L		101	80 - 120

Lab Sample ID: LCS 500-712697/2-A
Matrix: Water
Analysis Batch: 713284

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 712697

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	500	526.3		ug/L		105	80 - 120
Arsenic	100	104.3		ug/L		104	80 - 120
Manganese	500	532.9		ug/L		107	80 - 120
Vanadium	500	511.8		ug/L		102	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-712983/12-A
Matrix: Water
Analysis Batch: 713303

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 712983

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.079		0.20	0.079	ug/L		05/12/23 10:50	05/15/23 08:54	1

Lab Sample ID: LCS 500-712983/13-A
Matrix: Water
Analysis Batch: 713303

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 712983

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.98	1.83		ug/L		92	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-714037/33
Matrix: Water
Analysis Batch: 714037

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.12		1.0	0.12	mg/L			05/18/23 19:54	1
Fluoride	<0.19		1.0	0.19	mg/L			05/18/23 19:54	1

Lab Sample ID: LCS 500-714037/36
Matrix: Water
Analysis Batch: 714037

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	20.86		mg/L		104	90 - 110
Fluoride	20.0	21.16		mg/L		106	90 - 110

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 500-714280/3
Matrix: Water
Analysis Batch: 714280

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.12		1.0	0.12	mg/L			05/19/23 10:22	1
Fluoride	<0.19		1.0	0.19	mg/L			05/19/23 10:22	1
Sulfate	<0.21		1.0	0.21	mg/L			05/19/23 10:22	1

Lab Sample ID: LCS 500-714280/4
Matrix: Water
Analysis Batch: 714280

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	19.29		mg/L		96	90 - 110
Fluoride	20.0	19.73		mg/L		99	90 - 110
Sulfate	20.0	19.79		mg/L		99	90 - 110

Method: N07-0003 - Enzymatic Nitrate-Nitrite Nitrogen

Lab Sample ID: MB 500-713788/40
Matrix: Water
Analysis Batch: 713788

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	<0.041		0.10	0.041	mg/L			05/17/23 11:15	1

Lab Sample ID: LCS 500-713788/41
Matrix: Water
Analysis Batch: 713788

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	1.00	1.00		mg/L		100	90 - 110

Lab Sample ID: 500-233069-3 MS
Matrix: Water
Analysis Batch: 713788

Client Sample ID: MW-17WT
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	0.20		1.00	1.21		mg/L		102	90 - 110

Lab Sample ID: 500-233069-3 MSD
Matrix: Water
Analysis Batch: 713788

Client Sample ID: MW-17WT
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.20		1.00	1.21		mg/L		101	90 - 110	0	20

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill

Job ID: 500-233069-1

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-712631/28
Matrix: Water
Analysis Batch: 712631

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			05/10/23 16:38	1

Lab Sample ID: MB 500-712631/53
Matrix: Water
Analysis Batch: 712631

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			05/10/23 16:38	1

Lab Sample ID: LCS 500-712631/29
Matrix: Water
Analysis Batch: 712631

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	100	106.6		mg/L		107	90 - 110

Lab Sample ID: LCS 500-712631/54
Matrix: Water
Analysis Batch: 712631

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	100	105.9		mg/L		106	90 - 110

Lab Sample ID: 500-233069-1 DU
Matrix: Water
Analysis Batch: 712631

Client Sample ID: MW-14WT
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	235		235.3		mg/L		0.2	20

Lab Chronicle

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill

Job ID: 500-233069-1

Client Sample ID: MW-14WT

Date Collected: 04/28/23 08:00
Date Received: 04/29/23 11:40

Lab Sample ID: 500-233069-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			712697	BDE	EET CHI	05/11/23 09:42 - 05/11/23 10:12 [1]
Dissolved	Analysis	6020B		1	712962	FXG	EET CHI	05/11/23 21:44
Dissolved	Prep	3005A			712697	BDE	EET CHI	05/11/23 09:42 - 05/11/23 10:12 [1]
Dissolved	Analysis	6020B		1	713284	FXG	EET CHI	05/12/23 16:15
Dissolved	Prep	3005A			712697	BDE	EET CHI	05/11/23 09:42 - 05/11/23 10:12 [1]
Dissolved	Analysis	SM 2340B		1	713285	FXG	EET CHI	05/15/23 10:24
Dissolved	Analysis	300.0		1	714037	EH	EET CHI	05/18/23 22:37
Dissolved	Analysis	300.0		1	714280	MM	EET CHI	05/19/23 12:09
Dissolved	Analysis	SM 2320B		1	712631	EH	EET CHI	05/10/23 16:38

Client Sample ID: MW-16

Date Collected: 04/28/23 09:00
Date Received: 04/29/23 11:40

Lab Sample ID: 500-233069-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			712697	BDE	EET CHI	05/11/23 09:42 - 05/11/23 10:12 [1]
Dissolved	Analysis	SM 2340B		1	713285	FXG	EET CHI	05/15/23 10:24
Dissolved	Analysis	300.0		1	714037	EH	EET CHI	05/18/23 22:53
Dissolved	Analysis	300.0		1	714280	MM	EET CHI	05/19/23 12:24
Dissolved	Analysis	SM 2320B		1	712631	EH	EET CHI	05/10/23 16:38

Client Sample ID: MW-17WT

Date Collected: 04/28/23 10:00
Date Received: 04/29/23 11:40

Lab Sample ID: 500-233069-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	712311	AJP	EET CHI	05/10/23 02:39
Dissolved	Prep	3005A			712697	BDE	EET CHI	05/11/23 09:42 - 05/11/23 10:12 [1]
Dissolved	Analysis	6020B		1	712962	FXG	EET CHI	05/11/23 21:51
Dissolved	Prep	3005A			712697	BDE	EET CHI	05/11/23 09:42 - 05/11/23 10:12 [1]
Dissolved	Analysis	6020B		1	713284	FXG	EET CHI	05/12/23 16:22
Dissolved	Prep	7470A			712983	MJG	EET CHI	05/12/23 10:50 - 05/12/23 12:50 [1]
Dissolved	Analysis	7470A		1	713303	MJG	EET CHI	05/15/23 09:20
Dissolved	Prep	3005A			712697	BDE	EET CHI	05/11/23 09:42 - 05/11/23 10:12 [1]
Dissolved	Analysis	SM 2340B		1	713285	FXG	EET CHI	05/15/23 10:24
Dissolved	Analysis	300.0		1	714037	EH	EET CHI	05/18/23 23:09
Dissolved	Analysis	300.0		1	714280	MM	EET CHI	05/19/23 12:39
Dissolved	Analysis	N07-0003		1	713788	MM	EET CHI	05/17/23 10:47
Dissolved	Analysis	SM 2320B		1	712631	EH	EET CHI	05/10/23 16:38

Lab Chronicle

Client: Vernon County Solid Waste & Recycling
Job ID: 500-233069-1
Project/Site: Vernon County Landfill

Client Sample ID: Trip Blank
Lab Sample ID: 500-233069-4
Date Collected: 04/28/23 00:00
Matrix: Water
Date Received: 04/29/23 11:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	712311	AJP	EET CHI	05/10/23 01:25

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-233069-1
Project/Site: Vernon County Landfill

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999580010	08-31-23

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone 708 534-5200 Fax 708-534 5211

Chain of Custody Record

eurofins

500-233069 COC

Client Information	Sampler: Veronica Avanda	Lab PM: Fredrick Sandie	COC No: 500-112312-46531 2
Client Contact: Stacie Sanborn	Phone: 715-933-2351	E-Mail: Sandra Fredrick@et eurofinsus com	Page: Page 2 of 2
Company: Vernon County Solid Waste & Recycling	PWSID:	Analysis Requested	Job #: 500-233069
Address: S3705 County Road LF	Due Date Requested:		Preservation Codes: A HCL; B NaOH; C Zn Acetate; D Nitric Acid; E NaHSO4; F MeOH; G Amchlor; H Ascorbic Acid; I Ice; J DI Water; K EDTA; L EDA; M Hexane; N None; O AsNaO2; P Na2O4S; Q Na2SO3; R Na2S2O3; S H2SO4; T TSP Dodecahydrate; U Acetone; V MCAA; W pH 4-5; Y Trizma; Z other (specify); Other:
City: Viroqua	TAT Requested (days):		
State, Zip: WI 54665	Compliance Project: Δ Yes Δ No		
Phone: 608-634(Tel)	PO #: Purchase Order not required		
Email: stacie sanborn@vernoncounty org	WO #:		
Project Name: Vernon County Landfl	Project #: 50020572		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SM2340B - Hardness	2320B, 300 0_28D	6020B - Cu/Mn / Zn	300 0_28D Sulfate	6020B, 7470A As, Ba, B, Cd, Cr, Pb, Hg, Se, Ag, Mercury	300.0_28D - Fluoride	N07_0003 Nitrate-Nitrite	6020B - Sb, Be Co Ni Tl V	8260B VOC	Manganese	Arsenic, Chromium, Lead	Beryllium, Vanadium	Total Number of containers	Special Instructions/Note
			Preservation Code:				D	N	D	N	D	N	S	D	A					
1 MW-14 WT	4/28/23	800	G	Water			X	X								X	X	X		
2 MW-11	4/28/23	900	G	Water			X	X												Everything is dissolved/ field filtered except VOCs
3 MW-17 WT	4/28/23	1000	G	Water			X	X	X	X	X	X	X	X	X					
4 trip blank				Water																
				Water																
				Water																
				Water																
				Water																
				Water																
				Water																* Please send copy of Report to SEH

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment: ICE/cooler/fedex

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature] SEH, Inc.	4/28/2023		Stephanie Hernandez	4/29/23 1140	EETA
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: X Yes Δ No | Custody Seal No: 2133410

Cooler Temperature(s) °C and Other Remarks: 1.9 + 2.3

5/21/2023

Login Sample Receipt Checklist

Client: Vernon County Solid Waste & Recycling

Job Number: 500-233069-1

Login Number: 233069
List Number: 1
Creator: Hernandez, Stephanie

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.3
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing

1 2 3 4 5 6 7 8 9 10 11 12 13 14

ANALYTICAL REPORT

PREPARED FOR

Attn: Stacie Sanborn
Vernon County Solid Waste & Recycling
S3705 County Road LF
Viroqua, Wisconsin 54665

Generated 6/9/2023 9:12:37 AM

JOB DESCRIPTION

Vernon County Landfill

JOB NUMBER

500-234599-1

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

my EOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Authorization



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6/9/2023 9:12:37 AM

Authorized for release by
Sandie Fredrick, Project Manager II
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

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Job ID: 500-234599-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-234599-1

Receipt
The samples were received on 6/1/2023 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.3º C.

Metals
Method 6020B: The continuing calibration verification (CCV) associated with batch 500-717287 recovered above the upper control limit for Boron and Thallium. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Field Service / Mobile Lab
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill

Job ID: 500-234599-1

Client Sample ID: MW-17WT — Lab Sample ID: 500-234599-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Hardness as calcium carbonate	266		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	3.4		1.0	0.12	mg/L	1		300.0	Dissolved
Sulfate	5.3		1.0	0.21	mg/L	1		300.0	Dissolved
Alkalinity	260		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: MW-16 — Lab Sample ID: 500-234599-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Hardness as calcium carbonate	366		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	3.3		1.0	0.12	mg/L	1		300.0	Dissolved
Sulfate	10.2		1.0	0.21	mg/L	1		300.0	Dissolved
Alkalinity	362		5.0	3.7	mg/L	1		SM 2320B	Dissolved

Client Sample ID: MW-14WT — Lab Sample ID: 500-234599-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.92	J B	1.0	0.23	ug/L	1		6020B	Dissolved
Manganese	267		2.5	0.79	ug/L	1		6020B	Dissolved
Hardness as calcium carbonate	250		0.91	0.46	mg/L	1		SM 2340B	Dissolved
Chloride	4.8		1.0	0.12	mg/L	1		300.0	Dissolved
Sulfate	5.0		1.0	0.21	mg/L	1		300.0	Dissolved
Alkalinity	237		5.0	3.7	mg/L	1		SM 2320B	Dissolved

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill

Job ID: 500-234599-1

Method	Method Description	Protocol	Laboratory
6020B	Metals (ICP/MS)	SW846	EET CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	EET CHI
300.0	Anions, Ion Chromatography	EPA	EET CHI
SM 2320B	Alkalinity	SM	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill

Job ID: 500-234599-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-234599-1	MW-17WT	Water	05/30/23 11:00	06/01/23 10:00
500-234599-2	MW-16	Water	05/30/23 12:00	06/01/23 10:00
500-234599-3	MW-14WT	Water	05/30/23 13:00	06/01/23 10:00

Client Sample Results

Client: Vernon County Solid Waste & Recycling
Job ID: 500-234599-1
Project/Site: Vernon County Landfill

Client Sample ID: MW-17WT
Lab Sample ID: 500-234599-1
Date Collected: 05/30/23 11:00
Matrix: Water
Date Received: 06/01/23 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<12.7	^	50.0	12.7	ug/L		06/02/23 09:02	06/07/23 04:00	1
Thallium	<0.57	^	2.0	0.57	ug/L		06/02/23 09:02	06/07/23 04:00	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**266**		0.91	0.46	mg/L		06/02/23 09:02	06/08/23 12:38	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	**3.4**		1.0	0.12	mg/L			06/01/23 21:24	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			06/01/23 21:24	1
Sulfate (EPA 300.0)	**5.3**		1.0	0.21	mg/L			06/01/23 21:24	1
Alkalinity (SM 2320B)	**260**		5.0	3.7	mg/L			06/05/23 12:39	1

Client Sample Results

Client: Vernon County Solid Waste & Recycling
Job ID: 500-234599-1
Project/Site: Vernon County Landfill

Client Sample ID: MW-16
Lab Sample ID: 500-234599-2
Date Collected: 05/30/23 12:00
Matrix: Water
Date Received: 06/01/23 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<12.7	^	50.0	12.7	ug/L		06/02/23 09:02	06/07/23 04:05	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**366**		0.91	0.46	mg/L		06/02/23 09:02	06/08/23 12:38	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	**3.3**		1.0	0.12	mg/L			06/01/23 22:40	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			06/01/23 22:40	1
Sulfate (EPA 300.0)	**10.2**		1.0	0.21	mg/L			06/01/23 22:40	1
Alkalinity (SM 2320B)	**362**		5.0	3.7	mg/L			06/05/23 12:39	1

Client: Vernon County Solid Waste & Recycling
Job ID: 500-234599-1
Project/Site: Vernon County Landfill

Client Sample ID: MW-14WT
Lab Sample ID: 500-234599-3

Date Collected: 05/30/23 13:00
Matrix: Water
Date Received: 06/01/23 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.92**	**J B**	1.0	0.23	ug/L		06/02/23 09:02	06/07/23 04:09	1
Boron	<12.7	^	50.0	12.7	ug/L		06/02/23 09:02	06/07/23 04:09	1
Manganese	**267**		2.5	0.79	ug/L		06/02/23 09:02	06/07/23 04:09	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**250**		0.91	0.46	mg/L		06/02/23 09:02	06/08/23 12:38	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (EPA 300.0)	**4.8**		1.0	0.12	mg/L			06/01/23 23:25	1
Fluoride (EPA 300.0)	<0.19		1.0	0.19	mg/L			06/01/23 23:25	1
Sulfate (EPA 300.0)	**5.0**		1.0	0.21	mg/L			06/01/23 23:25	1
Alkalinity (SM 2320B)	**237**		5.0	3.7	mg/L			06/05/23 12:39	1

Definitions/Glossary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-234599-1
Project/Site: Vernon County Landfill

Qualifiers

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
B	Compound was found in the blank and sample.
J	Reported value was between the limit of detection and the limit of quantitation.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-234599-1
Project/Site: Vernon County Landfill

Metals

Prep Batch: 716497

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234599-1	MW-17WT	Dissolved	Water	3005A	
500-234599-2	MW-16	Dissolved	Water	3005A	
500-234599-3	MW-14WT	Dissolved	Water	3005A	
MB 500-716497/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-716497/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 717287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234599-1	MW-17WT	Dissolved	Water	6020B	716497
500-234599-2	MW-16	Dissolved	Water	6020B	716497
500-234599-3	MW-14WT	Dissolved	Water	6020B	716497
MB 500-716497/1-A	Method Blank	Total Recoverable	Water	6020B	716497
LCS 500-716497/2-A	Lab Control Sample	Total Recoverable	Water	6020B	716497

Analysis Batch: 717574

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234599-1	MW-17WT	Dissolved	Water	SM 2340B	716497
500-234599-2	MW-16	Dissolved	Water	SM 2340B	716497
500-234599-3	MW-14WT	Dissolved	Water	SM 2340B	716497

General Chemistry

Analysis Batch: 716289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234599-1	MW-17WT	Dissolved	Water	300.0	
500-234599-2	MW-16	Dissolved	Water	300.0	
500-234599-3	MW-14WT	Dissolved	Water	300.0	
MB 500-716289/34	Method Blank	Total/NA	Water	300.0	
LCS 500-716289/35	Lab Control Sample	Total/NA	Water	300.0	
500-234599-1 MS	MW-17WT	Dissolved	Water	300.0	
500-234599-1 MSD	MW-17WT	Dissolved	Water	300.0	
500-234599-2 MS	MW-16	Dissolved	Water	300.0	
500-234599-2 MSD	MW-16	Dissolved	Water	300.0	

Analysis Batch: 716980

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234599-1	MW-17WT	Dissolved	Water	SM 2320B	
500-234599-2	MW-16	Dissolved	Water	SM 2320B	
500-234599-3	MW-14WT	Dissolved	Water	SM 2320B	
MB 500-716980/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-716980/4	Lab Control Sample	Total/NA	Water	SM 2320B	

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 500-716497/1-A
Matrix: Water
Analysis Batch: 717287

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 716497

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.247	J	1.0	0.23	ug/L		06/02/23 09:02	06/07/23 02:45	1
Boron	<12.7	^	50.0	12.7	ug/L		06/02/23 09:02	06/07/23 02:45	1
Manganese	<0.79		2.5	0.79	ug/L		06/02/23 09:02	06/07/23 02:45	1
Thallium	<0.57	^	2.0	0.57	ug/L		06/02/23 09:02	06/07/23 02:45	1

Lab Sample ID: LCS 500-716497/2-A
Matrix: Water
Analysis Batch: 717287

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 716497

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	90.11		ug/L		90	80 - 120
Boron	1000	1111	^	ug/L		111	80 - 120
Manganese	500	519.4		ug/L		104	80 - 120
Thallium	100	110.8	^	ug/L		111	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-716289/34
Matrix: Water
Analysis Batch: 716289

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.12		1.0	0.12	mg/L			06/01/23 18:07	1
Fluoride	<0.19		1.0	0.19	mg/L			06/01/23 18:07	1
Sulfate	<0.21		1.0	0.21	mg/L			06/01/23 18:07	1

Lab Sample ID: LCS 500-716289/35
Matrix: Water
Analysis Batch: 716289

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	18.57		mg/L		93	90 - 110
Fluoride	20.0	19.86		mg/L		99	90 - 110
Sulfate	20.0	20.27		mg/L		101	90 - 110

Lab Sample ID: 500-234599-1 MS
Matrix: Water
Analysis Batch: 716289

Client Sample ID: MW-17WT
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	3.4		10.0	12.37		mg/L		90	80 - 120
Fluoride	<0.19		10.0	9.12		mg/L		91	80 - 120
Sulfate	5.3		10.0	14.99		mg/L		97	80 - 120

Lab Sample ID: 500-234599-1 MSD
Matrix: Water
Analysis Batch: 716289

Client Sample ID: MW-17WT
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	3.4		10.0	12.31		mg/L		90	80 - 120	0	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 500-234599-1 MSD
Matrix: Water
Analysis Batch: 716289

Client Sample ID: MW-17WT
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Fluoride	<0.19		10.0	9.12		mg/L		91	80 - 120	0	20
Sulfate	5.3		10.0	15.05		mg/L		98	80 - 120	0	20

Lab Sample ID: 500-234599-2 MS
Matrix: Water
Analysis Batch: 716289

Client Sample ID: MW-16
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	3.3		10.0	12.16		mg/L		89	80 - 120
Fluoride	<0.19		10.0	8.87		mg/L		89	80 - 120
Sulfate	10.2		10.0	20.06		mg/L		99	80 - 120

Lab Sample ID: 500-234599-2 MSD
Matrix: Water
Analysis Batch: 716289

Client Sample ID: MW-16
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	3.3		10.0	12.12		mg/L		89	80 - 120	0	20
Fluoride	<0.19		10.0	8.89		mg/L		89	80 - 120	0	20
Sulfate	10.2		10.0	19.98		mg/L		98	80 - 120	0	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-716980/3
Matrix: Water
Analysis Batch: 716980

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			06/05/23 12:39	1

Lab Sample ID: LCS 500-716980/4
Matrix: Water
Analysis Batch: 716980

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	100	94.66		mg/L		95	90 - 110

Lab Chronicle

Client: Vernon County Solid Waste & Recycling
Project/Site: Vernon County Landfill

Job ID: 500-234599-1

Client Sample ID: MW-17WT
Date Collected: 05/30/23 11:00
Date Received: 06/01/23 10:00

Lab Sample ID: 500-234599-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			716497	BDE	EET CHI	06/02/23 09:02 - 06/02/23 09:32 [1]
Dissolved	Analysis	6020B		1	717287	FXG	EET CHI	06/07/23 04:00
Dissolved	Prep	3005A			716497	BDE	EET CHI	06/02/23 09:02 - 06/02/23 09:32 [1]
Dissolved	Analysis	SM 2340B		1	717574	FXG	EET CHI	06/08/23 12:38
Dissolved	Analysis	300.0		1	716289	W1T	EET CHI	06/01/23 21:24
Dissolved	Analysis	SM 2320B		1	716980	EH	EET CHI	06/05/23 12:39

Client Sample ID: MW-16
Date Collected: 05/30/23 12:00
Date Received: 06/01/23 10:00

Lab Sample ID: 500-234599-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			716497	BDE	EET CHI	06/02/23 09:02 - 06/02/23 09:32 [1]
Dissolved	Analysis	6020B		1	717287	FXG	EET CHI	06/07/23 04:05
Dissolved	Prep	3005A			716497	BDE	EET CHI	06/02/23 09:02 - 06/02/23 09:32 [1]
Dissolved	Analysis	SM 2340B		1	717574	FXG	EET CHI	06/08/23 12:38
Dissolved	Analysis	300.0		1	716289	W1T	EET CHI	06/01/23 22:40
Dissolved	Analysis	SM 2320B		1	716980	EH	EET CHI	06/05/23 12:39

Client Sample ID: MW-14WT
Date Collected: 05/30/23 13:00
Date Received: 06/01/23 10:00

Lab Sample ID: 500-234599-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			716497	BDE	EET CHI	06/02/23 09:02 - 06/02/23 09:32 [1]
Dissolved	Analysis	6020B		1	717287	FXG	EET CHI	06/07/23 04:09
Dissolved	Prep	3005A			716497	BDE	EET CHI	06/02/23 09:02 - 06/02/23 09:32 [1]
Dissolved	Analysis	SM 2340B		1	717574	FXG	EET CHI	06/08/23 12:38
Dissolved	Analysis	300.0		1	716289	W1T	EET CHI	06/01/23 23:25
Dissolved	Analysis	SM 2320B		1	716980	EH	EET CHI	06/05/23 12:39

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: Vernon County Solid Waste & Recycling
Job ID: 500-234599-1
Project/Site: Vernon County Landfill

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999580010	08-31-23

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534-5211

SEND COPY OF REPORT TO SEH, Inc.

Chain of Custody Record

eurofins

Client Information	Sampler: Veronica Pranda 715-933-2351	Lab PM: Fredrick Sandie	500-234599 COC	COC No: 500 112312-46531 1
Client Contact: Stacie Sanborn		E-Mail: Sandra Fredrick@et eurofinsus com		Page: Page 1 of 2
Company: Vernon County Solid Waste & Recycling	PWS D			Job #: 500-234599
Address: S3705 County Road LF	Due Date Requested			
City: V roqua	TAT Requested (days)			
State Zip: WI 54665	Compliance Project: Δ Yes Δ No			
Phone: 608-634(Tel)	PO #: Purchase Order not requ red			
Email: stacie sanborn@vernoncounty org	WO #:			
Project Name: Vernon County Landfi	Project #: 50020572			
Site	SSOW#:			

Analysis Requested

Preservation Codes:
A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Y Trizma, Z other (specify)
Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SM2340B Hardness	2320B, 300.0_28D	6020B - Boron, Diss (FF)	6020B - Mn, As, Diss (FF)	6020B - TL-Diss (FF)	Total Number of containers	Special Instructions/Note
				Preservation Code:				D	N	D	N	D	A	
1	MW-17WT	5/30/23	1100	G	Water			X	X	X		X		All Dissolved & Field Filtered
2	MW-16	5/30/23	1200	G	Water			X	X	X				
3	MW-14WT	5/30/23	1300	G	Water			X	X	X	X			
					Water									
					Water									
					Water									
					Water									
					Water									
					Water									
					Water									

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ D sposal By Lab ☐ Archive For ____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method o Shipment
Relinquished by: , SEH, Inc.	Date/Time: 5/30/2023	Company	Received by: Stephanie Hernandez
Relinquished by	Date/Time	Company	Received by
Relinquished by	Date Time	Company	Received by

Received by	Date/Time: 6/1/23 1000	Company: EETA		
Received by	Date/Time	Company		
Received by	Date/Time	Company		

Custody Seals Intact: Δ Yes Δ No | Custody Sea No | Cooler Temperatures and Other Remarks: 3.4+3.3

Login Sample Receipt Checklist

Client: Vernon County Solid Waste & Recycling

Job Number: 500-234599-1

Login Number: 234599
List Number: 1
Creator: Hernandez, Stephanie

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.3
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

Appendix K

Soil Boring Logs within 300 feet of Proposed Expansion

BORING NO. TB-4

SURFACE ELEV. 1232.9

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1	1	3		Clay, Brown, with Silt	10 YR 5/3	CL	LOESS	-	
	3	4						-	
				2.0'				-	1230.9
2	3	4		Clay, Red-Brown to Brown, with Trace Sand and Gravel	5 YR 4/4	CL	RESIDUUM	2.5 --	
	8	11						-	
3	20	17						-	
	10	19			7.5 YR 4/6	CL		5 --	
4	18	15						-	
				7.0'				-	1225.9
	25	40		Sand, Yellow, with Gravel, Clay	7.5 YR 7/6	SC		7.5 --	
				8.0'				-	1224.9
5	12	11		Clay, Dark Brown, with Sand and Gravel	7.5 YR 3/4	CL		-	
	10	25						-	
								10 --	
6	2	5						-	
	5	6						-	
				12.0'				-	1220.9
7	17	19		Weathered Dolomite	2.5 YR 8/6		WEATHERED DOLOMITE	12.5 --	
	19	20						-	
	27	80						-	
				15.0'				15 --	1217.9
				E.O.B.				-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 28, 1988

LOCATION Klahn Site

GROUNDWTR _____ FT BELOW GS AT ELEV. OF _____

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-5

SURFACE ELEV. 1221.0

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1	1	1		Silt, Brown, with Clay	10 YR 4/3		LOESS	-	
	2	2		-2.0'-				-	1219.0
2	6	5		Clay, Red-Brown, with Trace Sand and Gravel	5 YR 4/4	CL	RESIDUUM	-	
	7	8						-	
3	2	5			2.5 YR 3/4			5	
	8	10						-	
4	3	5		-7.5'-				-	1213.5
	8	15		Sand, Red-Brown, with Clay and Occasional Gravel	5 YR 5/8	SC		-	
5	5	7						-	
	13	15		-10.0'-				10	1211.0
6	8	9		Clay, Red-Brown, with Sand and Trace Gravel	7.5 YR 4/6	CL		-	
	11	13						-	
7	5	8			10 YR 7/8			-	
	11	13		-14.0'-				-	1207.0
8	8	12		Clay, Red-Brown, with Dolomite Fragments, Mottles (2.5 YR 2/0)	5 YR 4/4	CL		15	
	10	7						-	
9	10	12						-	
	18	34						-	
10	5	8						-	
	10	14			10 YR 7/8			20	
11	8	10						-	
	14	11		-22.0'-				-	1199.0
12	32	36		Sand, with Dolomite Fragments and Silt	10 YR 7/6	SM	WEATHERED DOLOMITE	-	
	27	57						-	
13	32	100		-25.0'-				25	1196.0
				E.O.B.				-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 27, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-6

SURFACE ELEV. 1218.7

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1	2	2		Clay, Brown, with Silt	10 YR 4/3	CL	LOESS	-	
				1.0'				-	1217.7
	2	4		Clay, Red-Brown, with Trace Sand	5 YR 3/2	CL	RESIDUUM	-	
2	3	6						-	
								2.5	
	7	14						-	
								-	
				4.0'				-	1214.7
3	4	5		Clay, Brown, with Trace Gravel	7.5 YR 4/4	CL		-	
	9	12						5	
				6.0'				-	
4	10	0		Clay, Red-Brown, with Sand and Occasional Gravel	5 YR 4/4	CL		-	1212.7
	10	12						-	
				8.0'				7.5	
5	5	5		Clay, Red-Brown, with Sand and Trace Gravel	5 YR 3/3	CL		-	1210.7
					5 YR 4/8			-	
6	9	21						-	
								10	
	7	10			2.5 YR 4/8			-	
								-	
7	18	19						-	
					7.5 YR 6/8			12.5	
	21	8		13.5'				-	1205.2
8	5	6		Weathered Dolomite (No Recovery)			WEATHERED DOLOMITE	-	
	7	11						15	
								-	
9	100			16.5'				-	1202.2
				E.O.B.				-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 26, 1988

LOCATION Klahn Site

GROUNDWTR _____ FT BELOW GS AT ELEV. OF _____

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-7

SURFACE ELEV. 1245.38

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1	3	4			10 YR			-	
	4	5		Clay, Brown, with Trace Sand	5/3	CL	LOESS	-	
2	4	6		and Silt	7.5 YR			-	
	10	10			4/4			-	
3	3	5			10 YR			5 --	
	6	6			3/3			-	
4	1	2						-	
	1	6			7.5 YR			-	
5	4	9			4/2			-	
	9	11		10.0'				10 --	1235.28
6	4	9		Clay, Red-Yellow, with Weathered	5 YR		RESIDUUM	-	
	9	12		Dolomite Fragments	4/6			-	
7	9	11			7.5 YR			-	
	12	10			6/8			-	
8	8	9			5 YR			15 --	
	13	12		16.0'	4/3			-	1229.28
9	5	11		Clay, Brown, with Weathered	10 YR	CL		-	
	16	19		Dolomite Fragments	6/4			-	
10	8	18			5 Y			-	
	30	24		21.0'	8/1			20 --	
11	10	26		Sand, Brown, with Clay	10 YR	SC		-	1224.28
	26	21		22.0'	4/3			-	1223.28
12	8	9		Clay, Red-Brown	7.5 YR	CL		-	
	9	11			7/8			-	
13	8	9			5 YR			25 --	
	15	17			4/4			-	
14	6	7		Mottles (10 YR 8/6)	5 YR			-	
	7	10			5/8			-	
15	4	7			10 YR			-	
	19	16			4/4			30 --	
16	9	62		31.0'	7.5 YR			-	1214.28
	27	106		Clay, Red-Brown, with Trace Gravel	4/4	CL		-	
17	43	26			2.5 YR			-	
	14	18			4/6			-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 26, 1988

LOCATION Klahn Site

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-7

SURFACE ELEV. 1245.28

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6" 6" 12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
18	11 10		5 YR 4/4			-	
19	7 13					-	
	18 17					-	
		-38.0'-				-	1207.28
		No Recovery			WEATHERED DOLOMITE	-	
20	6 8					40 --	
	10 11					-	
						-	
						-	
		-45.0'-	10 YR 6/4			45 --	1200.28
21	- -	Sand, Brown, with Rock Fragments				-	
	74 28					-	
		-47.5'-				-	1197.78
		E.O.B.				-	
						50 --	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-8

SURFACE ELEV. 1249.42

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
1	2	2			10 YR			-	
	3	3		Silt, Brown, with Clay	3/2	CL	LOESS	-	
2	5	7						-	
	7	7						-	
3	3	5			7.5 YR			-	
	11	10			4/4			5 --	
				-----6.5'-----				-	1242.92
4	5	8			2.5 YR	SC	RESIDUUM	-	
	12	14		Sand, Red, with Silt and Clay	5/8			-	
5	8	10			7.5 YR			-	
	13	11			7/8			10 --	
6	5	6			5 YR			-	
	7	8		-----12.0'-----	6/8			-	
7	3	5		Weathered Dolomite, with Silt and Clay	7.5 YR			-	
	10	24		-----14.0'-----	7/8			-	1237.42
8	6	10			2.5 YR	SC		15 --	
	15	24		Sand, Red-Brown, with Clay and Gravel	4/8			-	
9	8	9			5 YR			-	
	16	17			4/6			-	
10	13	9						-	
	11	10			5 Y			20 --	
11	3	5			6/2			-	
	8	9		-----22.0'-----				-	1227.42
12	9	10		Clay, Red-Brown, with Silt, Trace Sand	5 YR	CL		-	
	11	11		-----24.0'-----	5/8			-	1225.42
13	5	10		Sand, Red-Brown, with Clay and Silt	2.5 YR	SC		25 --	
	11	11			4/6			-	
14	15	9			10 YR			-	
	7	7		-----28.0'-----	3/2			-	1221.42
15	5	6		Sand, Lt. Brown, with Gravel	10 YR	SC		-	
	11	18			7/8			30 --	
16	15	17			5 YR			-	
	7	5			5/8			-	
17	11	5			10 YR			-	
	13	9			8/3			-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED April 27 and 28, 1988

LOCATION Klahn Site

GROUNDWTR ____ FT BELOW GS AT ELEV. OF ____

DRILLERS Wisconsin Test Drilling

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-8

SURFACE ELEV. 1249.42

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	5	10			10 YR 8/4			-	
19	5	1						-	
	1	1		-----38.0'-----				-	1211.42
20	3	3		Clay, Red-Brown to Dark				-	
	3	4		Brown, Trace Sand and Gravel	5 YR 3/4	CL		40 --	
21	3	2			2.5 YR 3/4			-	
	2	8		-----42.0'-----				-	1207.42
22	5	4			10 YR 6/4		WEATHERED DOLOMITE	-	
	11	10		Weathered Dolomite				-	
23	18	14		-----45.5'-----				45 --	
	18	100		E.O.B.				-	
								-	
								-	
								-	
								50 --	
								-	
								-	
								-	
								-	
								--	
								-	
								-	
								-	
								-	
								--	
								-	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

MUN = MUNSELL SOIL COLOR

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 57786 DATE June 3, 1988

BORING NO. TB-15

SURFACE ELEV. 1193.5

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	4	8		Topsoil Disturbed	10 YR			-	
1	10	16	26	-0.5'-	6/2			-	
	6	12		Clay, Lt. Brown to Brown, With Silt	10 YR	CL	LOESS	-	
2	22	27	49	-3.5'-	6/4			-	1190.0
	5	9						5 --	
3	14	14	28	Clay, Lt. Brown to Brown,	5 YR	CL	RESIDUUM	-	
	10	6		with Dolomite Fragments	4/4			-	
4	8	9	17	and Occasional Sandy Layers				-	1185.5
	5	8			7.5YR	CL		-	
5	10	50	60		5/6			10 --	
	30	23		-11.5'-				-	
6	14	13	27	Weathered Dolomite			WEATHERED	-	1182.0
				-12.0'-			DOLOMITE	-	1181.5
				E.O.B.				-	
								15 --	
								-	
								-	
								-	
								-	
								20 --	
								-	
								-	
								-	
								-	
								25 --	
								-	
								-	
								-	
								-	
								--	
								-	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 24, 1989

LOCATION Klahn Site 3+85N 16+51E

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-15

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,252.9 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 W

Lat 90° 50' 375.0"
Long 43° 35' 934.0"

Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	TOPSOIL	OL									
				Brown, sandy, LEAN CLAY, little gravel										
			2.5											
2 AU			5.0											
			7.5		CL									
3 AU			10.0											
			12.5											
4 AU			15.0	Brown, LEAN CLAY, some sand, little gravel, occasional hard pan layers										
			17.5											
5 AU			20.0											
			22.5		CL									
6 AU			25.0											
			27.5											
			30.0											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature John E. Stalf | Firm Short Elliot Henrickson Inc. | Tel: Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-15 Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 AU			32.5	Brown, LEAN CLAY, some sand, little gravel, occasional hard pan layers *(continued)*										
8 AU			35.0		CL									
			37.5											
9 AU			40.0	BEDROCK, dolomite										
			42.5		BR									
			45.0	**Boring Refusal at 45 feet.** Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill - 2021 Geotech Investigation	3268	B-17

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chris B. Mathy Construction Co.	5/20/2021	5/20/2021	flight auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,238.8 Feet MSL	4.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat 90° 50' 363.0"
Long 43° 35' 955.0"
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU			0	TOPSOIL	OL									
			2.5	Brown, LEAN CLAY, some fine sand, layers of numerous cobbles and gravel										
2 AU			5.0											
			7.5											
3 AU			10.0											
			12.5											
4 AU			15.0		CL									
			17.5											
5 AU			20.0											
			22.5											
6 AU			25.0											
			27.5	BEDROCK, likely dolomite	BR									
			30.0											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
John E. Hall	Short Elliot Henrickson Inc.	Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-17 Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 AU			32.5	BEDROCK, likely dolomite *(continued)*	BR									
8 AU			35.0											
			37.5	**Boring Refusal at 39 feet.** Lithologic Descriptions are based entirely on auger cuttings and therefore are very generalized. Difficulty advancing augers.										

BORING NO. MW-3

SURFACE ELEV. 1233.0

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	No Samples CORE RUN Obtained FROM	TO	CLASSIFICATION AND REMARKS Note: Logs based on drill cuttings.	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Clay, Red					
			20'				20	1213.0
			Dolomite, Broken Up With Several Crevices Between 70 and 80 ft. (1163.0 and 1153.0)				40	
							60	
			80'				80	1153.0
			Dolomite, Hard				100	
							120	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED February 1, 1988

LOCATION Klahn Site, 14+81N 16+25E

GROUNDWTR 171.38 FT BELOW GS AT ELEV. OF 1061.62

DRILLERS Ace Well Drilling

JOB NO. 57786 DATE 12/21/88

BORING NO. MW-3

SURFACE ELEV. 1233.0

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Dolomite with Crevices Between 145' and 150'					
			(1088.0 and 1083.0)				160	
			Well set at 177.70 ft. (1055.3)					
			180'				180	1053.0
			E.O.B.					
							200	
							220	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR 171.38 FT BELOW GS AT ELEV. OF 1061.62

DRILLERS

JOB NO. 57786 DATE 12/21/88

BORING NO. MW-4

SURFACE ELEV. 1232.9

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	No Samples CORE RUN Obtained FROM	TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Note: Logs based on drill cuttings.					
			Clay, Red					
			20'				20	1212.9
			Dolomite, Broken With Several Small Crevices Between 70 and 80 ft. (1162.9 and 1152.9)				40	
							60	
			80'				80	1152.90
			Dolomite, hard				100	
							120	

Note: Depth to Groundwater refers to perched water.

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED January 28, 1988

LOCATION Klahn Site 14+81N, 16+34E

GROUNDWTR 87.41 FT BELOW GS AT ELEV. OF 1145.49

DRILLERS Ace Well Drilling

JOB NO. 57786 DATE 12/21/88

BORING NO. MW-4

SURFACE ELEV. 1232.9

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Dolomite, Hard, With Several Crevices Between 145 and 150 ft. (1087.9 and 1082.9)					
			160'				160	1072.9
							180	
							200	
							220	
							50	
							55	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 57786 DATE

Missing other pages

BORING NO. MW-5A

SURFACE ELEV. 1224.0

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	4	3		0.5'				-	
1	6	9	15	Silt, Lt. Brown, With Clay	10 YR 6/4	ML	LOESS	-	
	7	7		3.0'				-	1221.0
2	15	12	27	Clay, Red-Brown, With Sand	5YR 4/6	CL	RESIDUUM	-	
	8	8						5	
3	7	12	19	6.0'				-	1218.0
	5	8			10 YR 7/6	SC		-	
4	12	14	26	Sand/Clay Mixture, Yellow to Red-Brown to				-	
	11	12		Brown, With Dolomite Fragments and Silt	10 YR 6/6			-	1215.0
5	9	12	21					10	
	4	8						-	
6	10	12	22		10 YR 4/3	SC		-	
	4	5						-	
7	10	13	23					-	
	6	9						15	
8	8	18	26		10 YR 4/4	SC		-	1208.5
	19	35						-	
9	8	11	19	17.5'				-	1206.5
	5	9		Weathered Dolomite With Silty Sand	10 YR 7/2		WEATHERED DOLOMITE	-	
10	15	41	56					20	
	50	-		20.5'				-	1203.5
								-	
								-	
				No Samples: Rotary Drilling				-	
								25	
								-	
								-	
								-	
								-	
								-	
								-	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 23, 1989

LOCATION Klahn 8+64N 12+58E

GROUNDWT 88.8 FT BELOW GS AT ELEV. OF 1135.18

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

BORING NO. MW-5

SURFACE ELEV. 1223.3

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	No Samples CORE RUN Obtained FROM	TO	CLASSIFICATION AND REMARKS Note: Logs based on drill cuttings.	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Clay, Red					
			20'				20	1203.3
			Dolomite With Streaks of Clay					
			35'					1188.3
			Dolomite, Broken Up, With Crevices at: 43'-44' (1179.3-1180.3) 65'-67' (1156.3-1158.3) 87'-88' (1135.3-1136.3) 93'-94' (1129.3-1130.3)				40 60 80	
			102'				100	1121.3
			Dolomite, Hard				120	
			135'					1088.3

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

* = Well was dry on 12/21/88

PROJECT Vernon County Landfill

DATE(S) DRILLED February 16, 1988

LOCATION Klahn Site 8+62N, 18+04E

GROUNDWTR * FT BELOW GS AT ELEV. OF

DRILLERS Ace Well Drilling

JOB NO. 57786 DATE 12/21/88

BORING NO. MW-5

SURFACE ELEV. 1223.3

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Dolomite, Broken Up, With Crevices at: 135' to 137' (1086.3-1088.3) 158' to 160' (1063.3-1065.3) Set Well at 158.57' (1064.73)				160	
			180' E.O.B.				180	1043.3
							200	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 57786 DATE

BORING NO. MW-6

SURFACE ELEV. 1233.0

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	No Samples CORE RUN Obtained FROM	TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Note: Logs based on drill cuttings.					
			Clay, Red.					
			14'					1219.0
			Dolomite, Broken Up With Crevices At: 23'-25' (1208.0-1210.0) 28'-29' (1204.0-1205.0)				20 40 60	
			80'				80	1153.0
			Dolomite, Fairly Consistent				100 120	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED February 19, 1988

LOCATION Klahn Site, 14+80N, 16+21E

GROUNDWTR 174.15 FT BELOW GS AT ELEV. OF 1058.85

DRILLERS Ace Well Drilling

JOB NO. 57786 DATE 12/21/89

BORING NO. MW-6

SURFACE ELEV. 1233.0

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Dolomite, Fairly Consistent				160	
			180'				180	1053.0
			Dolomite, Sandy Set Well at 199.93' (1033.07)				200	
			210' E.O.B.					1023.0
							220	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR 174.15 FT BELOW GS AT ELEV. OF 1058.85

DRILLERS

JOB NO. 57786 DATE

BORING NO. MW-10

SURFACE ELEV. 1215.6

Page 1 of 6

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12 "	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	3	4		Topsoil Disturbed	10 YR			-	
1	6	7	13	0.5'	5/2		LOESS	-	
	5	6		Silt/Clay, Lt. Brown	10 YR	CL		-	
2	13	16	29	4.5'	6/6			-	1211.1
	6	6		Med. Sand, Red-Brown,	7.5YR	SC		5	
3	7	11	18	With Some Clay	5/6		RESIDUUM	-	
	4	6		7.0'	10 YR			-	1208.6
4	10	13	23	Clay/Silt, Lt. Gray-Brown,	7/1	CL		-	
	6	10		With Pebbles @ 9.0'	7.5YR			-	
5	12	20	32	9.5'	5/6			10	1206.1
	7	9		Med. Sand, Red-Brown,	7.5YR	SC		-	
6	13	19	32	With Some Clay	5/8			-	
	12	16						-	
7	24	25	49	14.5'				-	1201.1
	11	23						15	
8	18	19	37	Med. Sand, Tan to Brown,	10 YR	SC		-	
	5	22		With Clay	6/4			-	
9	29	20	49	18.0'				-	1197.6
	10	15		Med. Sand, Yellow to Lt. Brown	10 YR			-	
10	16	21	37	to Red-Brown,	7/8	SP-SM		20	
	10	15		With Silt, Trace Clay	10 YR			-	
11	19	24	43		6/4			-	
	17	12						-	
12	11	12	23	24.5'				-	1191.1
	50	-	-	continued on page 2 of 6			WEATHERED DOLOMITE	25	
								-	
								-	
								-	
								-	
								-	
								-	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

PPR = POCKET PEN READING

X = SPLIT SPOON

MUN = MUNSELL SOIL COLOR (DRY SOIL)

PROJECT Vernon County Landfill

DATE(S) DRILLED August 24, 1989

LOCATION Klahn Site 2+16N 16+57E

GROUNDWT 145.47 FT BELOW GS AT ELEV OF 1070.13

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			No Samples - Poor Quality Dolomite w/Clay Residuum				30	
							35	
							40	
							45	
							50	
							55	

KEY

REC = PERCENT RECOVERY

FF = FRACTURE FREQUENCY (PER FOOT)

RQD = ROCK QUALITY DESIGNATION

PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE Jan. 5, 1990

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			61.0					1154.6
1	61	66.5	Dolomite, With Occasional Small Vugs	18%	2.02	6.4%	65	
2	66.5	71.5		0%	-	-	70	
			71.5					1144.1
3	71.5	74.0	Poorly Consolidated Silty Sandstone	0%	-	0%		
			74.0					1141.6
4	76.5	80.0	Dolomite, With Occasional Small Vugs	75%	1.52	59%	75 80	
5	80	89		52%	3.2	17%	85	
6	89	99.5		100%	2.1	77%	90	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
7	99.5	106.8	100'	90%	3.03	51.6%	100	1115.6
			Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds					
8	106.8	110.5	106.0	100%	1.1	100%	105	1109.6
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds				110	
9	110.5	120.5		100%	1.3	93%	115	
							120	
10	120.5	129.3		90%	1.3	80%	125	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

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SURFACE ELEV. 1215.6

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
11	129.3	133		18%	6.0	0%		
			134					1081.6
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds; Numerous Small Vugs				135	
12	133	140.5		100%	2.3	63%		
			139.0					1076.6
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds; Few to No Vugs.				140	
13	140.5	150.5		100%	1.5	82%	145	
14	150.5	155.2		100%	0.9	96%	150	
			155.5				155	
15	155.2	157.5	Dolomitic Sandstone, Brown	100%	1.3	83%		1060.1
			157.5					1058.1
			Sandy Dolomite With Occasional Sandstone and Gray-Green Shale Interbeds				160	
16	157.5	167		100%	1.7	73%		
			163.0					1052.6

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-10

SURFACE ELEV. 1215.6

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			Dolomitic Sandstone With Occasional Gray-Green Shale Interbeds					1048.6
			167.0					
17	167	177	Sandy Dolomite and Dolomitic Sandstone With Occasional Gray-Green Shale Interbeds	100%	2.2	73%	170	
			172.5					1043.1
			Sandstone, Brown, Fine to Medium Grained With Occasional Cross Beds				175	
18	177	181		100%	2.0	79%		
			178.5					1037.1
			Dolomitic Sandstone With Some Sandy Dolomite				180	
			181.0					1034.6
			E.O.B.					
							185	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-11

SURFACE ELEV. 1216.4

Page 1 of 5

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	3	4		Topsoil Disturbed	10 YR			-	
1	6	7	13	-0.5'-	5/2		LOESS	-	
	5	6		Silt/Clay, Lt. Brown	10 YR	CL		-	
2	13	16	29	-4.5'-	6/6			-	1211.1
	6	6		Med. Sand, Red-Brown,	7.5YR	SC		5 --	
3	7	11	18	With Some Clay	5/6		RESIDUUM	-	
	4	6		-7.0'-	10 YR			-	1208.6
4	10	13	23	Clay/Silt, Lt. Gray-Brown,	7/1	CL		-	
	6	10		With Pebbles @ 9.0'	7.5YR			-	
5	12	20	32	-9.5'-	5/6			10 --	1206.1
	7	9		Med. Sand, Red-Brown,	7.5YR	SC		-	
6	13	19	32	With Some Clay	5/8			-	
	12	16						-	
7	24	25	49	-14.5'-				-	1201.1
	11	23						15 --	
8	18	19	37	Med. Sand, Tan to Brown,	10 YR	SC		-	
	5	22		With Clay	6/4			-	
9	29	20	49	-18.0'-				-	1197.6
	10	15		Med. Sand, Yellow to Lt. Brown	10 YR			-	
10	16	21	37	to Red-Brown,	7/8	SP-SM		20 --	
	10	15		With Silt, Trace Clay	10 YR			-	
11	19	24	43		6/4			-	
	17	12						-	
12	11	12	23	-24.5'-				-	1191.1
	50	-	-	continued on page 2 of 5			WEATHERED DOLOMITE	25 --	
								-	
								-	
								-	
								--	
								-	
								-	
								-	

KEY

USC = UNIFIED SOIL CLASSIFICATION

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PROJECT Vernon County Landfill

DATE(S) DRILLED August 24, 1989

LOCATION Klahn Site 2+16N 16+57E

GROUNDWT 145.47 FT BELOW GS AT ELEV OF 1070.13

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			No Samples - Poor Quality Dolomite w/Clay Residuum				30	
							35	
							40	
							45	
							50	
							55	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE Jan. 5, 1990

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN

ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			61.0					1154.6
1	61	66.5	Dolomite, With Occasional Small Vugs	18%	2.02	6.4%	65	
2	66.5	71.5		0%	-	-	70	
			71.5					1144.1
3	71.5	74.0	Poorly Consolidated Silty Sandstone	0%	-	0%		
			74.0					1141.6
4	76.5	80.0	Dolomite, With Occasional Small Vugs	75%	1.52	59%	75	
5	80	89		52%	3.2	17%	80	
6	89	99.5		100%	2.1	77%	85	
							90	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
							-	
							-	
							-	
7	99.5	106.8		90%	3.03	51.6%	-	
			100'				100 --	1115.6
			Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds				-	
							-	
							-	
							-	
							105 --	
8	106.8	110.5	106.0	100%	1.1	100%	-	1109.6
							-	
							-	
							-	
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds				110 --	
							-	
							-	
9	110.5	120.5		100%	1.3	93%	-	
							115 --	
							-	
							-	
							-	
							-	
							120 --	
							-	
							-	
10	120.5	129.3		90%	1.3	80%	-	
							-	
							125 --	
							-	
							-	
							-	
							-	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-11

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
11	129.3	133		18%	6.0	0%	-	
							-	
							-	
			134				-	1081.6
			Sandy Dolomite, With Occasional Sandstone and				135 --	
12	133	140.5	Gray-Green Shale Interbeds; Numerous Small Vugs	100%	2.3	63%	-	
							-	
			139.0				-	1076.6
			Sandy Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds; Few to No Vugs.				140 --	
13	140.5	150.5		100%	1.5	82%	-	
							145 --	
							-	
							-	
							-	
							-	
							150 --	
14	150.5	155.2		100%	0.9	96%	-	
							-	
							-	
							-	
			155.5				155 --	
15	155.2	157.5	Dolomitic Sandstone, Brown	100%	1.3	83%	-	1060.1
							-	
			157.5				-	1058.1
			Sandy Dolomite With Occasional Sandstone and Gray-Green				-	
							160 --	
16	157.5	167	Shale Interbeds	100%	1.7	73%	-	
							-	
			163.0				----- -	1052.6
			End of Boring - Set Well				-	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

BORING NO. MW-12

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN ENGINEERS

P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	BLOWS ON SAMPLER (140 lbs., 2" O.D. - FALLING 30") 6"	6"	12"	CLASSIFICATION AND REMARKS	MUN	USC	GEOLOGY	DEPTH	ELEV. (ft.)
	3	4		Topsoil Disturbed	10 YR			-	
1	6	7	13	-0.5'-	5/2		LOESS	-	
	5	6		Silt/Clay, Lt. Brown	10 YR	CL		-	
2	13	16	29	-4.5'-	6/6			-	1211.1
	6	6		Med. Sand, Red-Brown,	7.5YR	SC		5 --	
3	7	11	18	With Some Clay	5/6		RESIDUUM	-	
	4	6		-7.0'-	10 YR			-	1208.6
4	10	13	23	Clay/Silt, Lt. Gray-Brown,	7/1	CL		-	
	6	10		With Pebbles @ 9.0'	7.5YR			-	
5	12	20	32	-9.5'-	5/6			10 --	1206.1
	7	9		Med. Sand, Red-Brown,	7.5YR	SC		-	
6	13	19	32	With Some Clay	5/8			-	
	12	16						-	
7	24	25	49	-14.5'-				-	1201.1
	11	23						15 --	
8	18	19	37	Med. Sand, Tan to Brown,	10 YR	SC		-	
	5	22		With Clay	6/4			-	
9	29	20	49	-18.0'-				-	1197.6
	10	15		Med. Sand, Yellow to Lt. Brown	10 YR			-	
10	16	21	37	to Red-Brown,	7/8	SP-SM		20 --	
	10	15		With Silt, Trace Clay	10 YR			-	
11	19	24	43		6/4			-	
	17	12						-	
12	11	12	23	-24.5'-				-	1191.1
	50	-	-	continued on page 2 of 4			WEATHERED DOLOMITE	25 --	
								-	
								-	
								-	
								--	
								-	
								-	
								-	
								-	

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PROJECT Vernon County Landfill

DATE(S) DRILLED August 24, 1989

LOCATION Klahn Site 2+16N 16+57E

GROUNDWT 145.47 FT BELOW GS AT ELEV OF 1070.13

DRILLERS Exploration Technology, Inc.

JOB NO. 703 DATE Jan. 3, 1990

BORING NO. MW-12

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			No Samples - Poor Quality Dolomite w/Clay Residuum				30	
							35	
							40	
							45	
							50	
							55	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE Jan. 5, 1990

BORING NO. MW-12

SURFACE ELEV. 1216.4

CENTRAL WISCONSIN
ENGINEERS
P.O. BOX F - SCHOFIELD, WI 54476 - (715)359-9400

SAMP #	CORE RUN FROM	CORE RUN TO	CLASSIFICATION AND REMARKS	REC (%)	FF	RQD (%)	DEPTH	ELEV. (ft.)
			61.0					1154.6
			Dolomite, With Occasional Small Vugs					
1	61	66.5		18%	2.02	6.4%	65	
2	66.5	71.5		0%	-	-	70	
			71.5					1144.1
			Poorly Consolidated Silty Sandstone					
3	71.5	74.0		0%	-	0%		
			74.0					1141.6
							75	
4	76.5	80.0	Dolomite, With Occasional Small Vugs	75%	1.52	59%		
							80	
5	80	89		52%	3.2	17%	85	
6	89	99.5		100%	2.1	77%	90	

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PROJECT Vernon County Landfill

DATE(S) DRILLED

LOCATION

GROUNDWTR FT BELOW GS AT ELEV. OF

DRILLERS

JOB NO. 70389 DATE

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 5-92

Facility/Project Name *Vernon Co. Balefill*			**License/Permit/Monitoring Number** *03268*	**Boring Number** *MW-14*	
Boring Drilled By (Firm name and name of crew chief) *Traut Hydro Tech* *Daryl Karasch*			**Date Drilling Started** *03/10/2003*	**Date Drilling Completed** *03/12/2003*	**Drilling Method** *Versa Sonic*
DNR Facility Well No. *118*	**WI Unique Well No.** *JX072*	**Common Well Name** *MW-14*	**Final Static Water Level** *1066.87 Feet MSL*	**Surface Elevation** *1247.5 Feet MSL*	**Borehole Diameter** *7.0" inches*
Boring Location **State Plane** *N, E* *SW 1/4, SE 1/4, Sec. 15, T13N, R4E*			**Lat** *43 / 35' / 49.49"* **Long** *90 / 4.' / 14.85"*	**Local Grid Location (if applicable)** *1275.90 Feet* ***N*** *1678.68 Feet* ***E***	
County *Vernon*			**DNR County Code** *63*	**Civil Town/City/ or Village** *Viroqua*	

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			2 4 6 8 10 12 14 16 18 20 22	See Boring Log for MW-14Z										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Peter D Trautsen Firm Central Wisconisn Engineers & Architects

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			26											
			28											
			30											
			32											
			34											
			36											
			38											
			40											
			42											
			44											
			46											
			48											
			50											
			52											
			54											
			56											
			58											
			60											
			62											

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			66											
			68											
			70											
			72											
			74											
			76											
			78											
			80											
			82											
			84											
			86											
			88											
			90											
			92											
			94											
			96											
			98											
			100											
			102											

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			106											
			108											
			110											
			112											
			114											
			116											
			118											
			120											
			122											
			124											
			126											
			128											
			130											
			132											
			134											
			136											
			138											
			140											
			142											

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			146											
			148											
			150											
			152											
			154											
			156											
			158											
			160											
			162											
			164											
			166											
			168											
			170											
			172											
			174											
			176											
			178											
			180											
			182											

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			186											
			188											
			190											
				E.O.B. @ 190'										
			192											
			194											
			196											
			198											
			200											
			202											
			204											
			206											
			208											
			210											
			212											
			214											
			216											
			218											
			220											
			222											

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	MW-14Z

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Traut Hydro Tech Daryl Karasch	03/05/2003	03/07/2003	Versa Sonic

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
119	JX073	MW-14Z	1067.07 Feet MSL	1247.5 Feet MSL	7.0 inches

Boring Location State Plane N, E	Lat / Long	Local Grid Location (if applicable)
SW 1/4, SE 1/4, Sec. 15, T13N, R4E	Lat 43 / 35' / 49.49" Long 90 / 43' / 14.85"	1261.80 Feet N 1691.28 Feet E

County	DNR County Code	Civil Town/City/ or Village
Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	10/10		2-4-6	Yellowish brown clayey silt, little sand (Loess)	CL			10YR 5/8						
			6-8	Reddish brown sandy clayey silt	CL			10YR 6/8						
			8-10-12	Red, yellow, brown silty sand w/varying amounts of clay	SC			7.5YR 6/8						
	10/10		12-14-16		SM			10YR 7/8						
			16-18-20	Red, yellow, brown sandy, clayey silt	CL			10YR 5/8						
	10/10		20-22		SM			10YR 7/8						

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Peter D Arntzen Firm Central Wisconisn Engineers & Architects

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	10/10		26–28	Red, yellow, brown silty sand w/varying amounts of clay	SM			10YR 7/8						
	9/10		30–40											
	8/10		40–42	Yellow, red, brown sandy, clayey silt w/little gravel	CL			10YR 6/8						
			42–44											
			44–46	Brown sandy clayey silt and silty clay w/little gravel										
			46–48		CH			10YR 4/4						
			48–50											
	6/10		50–52		SM			10YR 7/4						
			52–54	Yellowish brown silty sand w/varying amounts of clay and occasional clay lenses										
			54–56		SP/SM									
			56–58											
			58–60		SM									
	8/10		60–62		SC									

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	8/10		66–70	Brown silty clayey sand and sandy, clayey silt, little to trace gravel	SC / CL									
	10/10		72–80	Grayish brown silty sand, little to trace clay and occasional coarse gravel	SM			10YR 7/4						
	10/10		84–90		ML			10YR 6/8						
	10/10		96–100	Same, but with increasing coarse gravel	GM									
	9/10		102	Dolomite, occasional small vugs	Bdrk									Rec: 81%

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	9/10		106 108 110	(Highly fractured zone @ 110' – 111')										FF: 5.6/ft RQD: 4%
	9/10		112 114 116 118	(Highly fractured zone @ 118' – 120')										Rec: 75% FF: 5.1/ft RQD: 0%
	10/10		120 122 124 126		Bdrk									Rec: 94% FF: 3.5/ft RQD: 41%
			128	Sandy Dolomite										
			130	Dolomite										
	10/10		132 134 136 138	Sandy Dolomite with Grey-Green Shale and Sandstone Interbeds										Rec: 97% FF: 2.6/ft RQD: 69%
	9/10		140 142	Dolomite, occasional small vugs (Highly fractured zone @ 142' – 143')										Rec: 69%

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	9/10		146 148 150		Bdrk									FF: 4.4/ft RQD: 17%
	9/10		152 154 156	(Highly fractured zone @ 154' – 156')										Rec: 81% FF: 5.9/ft RQD: 0%
	9/10		158 160 162 164 166	(Highly fractured zone @ 158' – 159') Dolomite, occasional small vugs										Rec: 87% FF: 4.1/ft RQD: 31%
	8/10		168 170 172 174 176	(Highly fractured zone @ 175'– 177')										Rec: 72% FF: 4.6/ft RQD: 18%
	8/10		178 180 182	Sandy siltstone Dolomite										Rec: 65%

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell Color	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
	8/10		186	(Highly fractured zone @ 183'–186')	Bdrk									FF: 4.8/ft RQD: 13%
			188	Sandy dolomite and dolomitic sandstone										
			190											
	6/10		192	(Highly fractured zone @ 191'–195')										Rec: 56% FF: 5.0/ft RQD: 4%
			194											
			196											
			198	(Highly fractured zone @ 198'–199')										
	6/10		200											Rec: 49% FF: 5.1/ft RQD: 18%
			202											
			204											
			206											
			208	Silty, dolomitic sandstone with shale partings										
			210	E.O.B. @ 210'										
			212											
			214											
			216											
			218											
			220											
			222											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	B-18

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/19/2022	9/19/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,239.0 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 164,513 N, 715,479 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	24		0	LEAN CLAY (CL), brown to gray, moist, some sand, medium plasticity, mottled (Residuum)						20	38	19	84	1% Gravel, 15% Sand
2 SS	18 / 7	2 3 4	1.5							27	64	40	86	0% Gravel, 14% Sand
3 SS	18 / 8	2 3 3	3.0		CL					27	51	32	64	0% Gravel, 37% Sand
4 SS	18 / 14	3 7 8	4.5							10				
5 SS	18 / 14	3 7 9	6.0							15	39	24	41	0% Gravel, 59% Sand
6 SS	18 / 16	6 6 5	7.5	CLAYEY SAND (SC), brown to gray, moist, fine to medium grained, slightly cohesive (Residuum)	SC					27	72	49	70.5	0% Gravel, 30% Sand
7 SS	18 / 16	5 8 8	9.0	CLAYEY SAND (SC), orangish brown, moist, fine grained, slightly cohesive (Residuum)	SC					20				
8 SS	18 / 12	3 3 12	10.5							16				
9	18	14	12.0											
			13.5	LEAN CLAY (CL), dark brown to dark reddish brown, moist, little sand, medium plasticity, light brown sandy transition (Residuum)	CL									
			15.0											
			16.5											
			18.0	WEATHERED SANDY DOLOSTONE, light brown, moist, fine grained, with fine to medium gravel, some clay (Saprolite)										
			19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
Aaron Kutz	Short Elliott Hendrickson Inc.	Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-18 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	14	12 10	21.0	WEATHERED SANDY DOLOSTONE, light brown, moist, fine grained, with fine to medium gravel, some clay (Saprolite) *(continued)*										
			22.5	NOTE: larger pieces of dolostone bedrock from 20 to 25 feet.										
			24.0											
10 SS	24 5	50+	25.5											
			27.0											
			28.5											
11 SS	12 1	50+	30.0	No Recovery Boring Terminated at 30 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	B-19

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/19/2022	9/19/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,233.3 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 164,380 N, 715,477 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	24		0	LEAN CLAY (CL), brown to gray, moist, little fine sand, medium plasticity (Residuum or Fill)							50	33	75	0% Gravel, 26% Sand
2 SS	18 / 10	4 7 4	1.5 / 3.0		CL					16	52	33	54	24% Gravel, 23% Sand
3 SS	18 / 10	2 3 2	4.5 / 6.0	LEAN CLAY (CL), brown to gray, moist, with sand, low to medium plasticity (Residuum)						44				
4 SS	18 / 12	4 2 2	7.5 / 9.0	NOTE: sand seam from 7 to 7.5 feet, fine to medium grained.	CL					53				
5 SS	18 / 14	2 2 2	10.5 / 12.0							54				
6 SS	18 / 6	1 2 1	13.5	NOTE: gravel from 12.5 to 13.5 feet of weathered bedrock.						33				
7 SS	18 / 8	1 1 1	15.0 / 16.5	FAT CLAY (CH), brown, moist, little sand and gravel, high plasticity, soft (Residuum)	CH					40				
8 SS	18 / 14	1 1 2	18.0 / 19.5							57	105	71	97	0% Gravel, 3% Sand
9	18	0								57				

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: / Fax:
Aaron Kutz	Short Elliott Hendrickson Inc.	

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-19 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	6	1 5	21.0	WEATHERED SANDY DOLOSTONE, light brown to gray, moist, silt with sand and gravel, loose (Saprolite).										
			22.5											
			24.0											
10 SS	18 4	50+	25.5											
			27.0											
11 SS	18 1	50+		Boring Terminated at 28 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	B-20

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/19/2022	9/19/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,215.8 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 164,064 N, 715,518 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	24		0	LEAN CLAY (CL), reddish brown, moist, with gravel, some sand, medium plasticity, medium stiff (Residuum)							58	42	65	0% Gravel, 35% Sand
2 SS	18 / 12	10 4 5	1.5							19				
3 SS	18 / 12	3 4 6	3.0		CL					27				
4 SS	18 / 12	2 3 6	4.5	NOTE: decreased gravel content						33				
5 SS	18 / 12	2 12 11	6.0	SANDY LEAN CLAY (CL), brown, moist, low plasticity (Residuum)						15				
6 SS	18 / 12	3 4 5	7.5		CL					30				
7 SS	18 / 14	2 1 2	9.0	LEAN CLAY (CL), dark brown to brown, moist, little sand, low to medium plasticity (Residuum)						46				
8 SS	18 / 16	5 4 4	10.5	NOTE: blue to green colored seam at 15 feet. NOTE: increased sand content between 17 to 17.5 feet.	CL					39				
9	18	4	12.0											
			13.5											
			15.0											
			16.5											
			18.0											
			19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
Aaron Kutz	Short Elliott Hendrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-20 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	16	7 12	21.0	WEATHERED SANDSTONE, poorly graded sand to silty sand, brown, moist to dry, fine grained (Saprolite).	CL									
			22.5											
			24.0											
10 SS	18 3	50+	25.5											
			27.0											
11 SS	18 10	14 18 50+	28.5											
			30.0	Boring Terminated at 30 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	B-21

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/19/2022	9/19/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	1,226.1 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 163,857 N, 715,398 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	24		0	LEAN CLAY (CL), brown, moist, medium to high plasticity, medium stiff (Fill)							67	48	75	0% Gravel, 25% Sand
			1.5											
2 SS	18 / 8	2 2 3	3.0							24	50	34	76	0% Gravel, 25% Sand
					CL									
3 SS	18 / 8	1 1 2	4.5							25				
			6.0											
4 SS	18 / 12	1 4 8	7.5							19				
				NOTE: trace to little gravel at 7.5 feet.										
			9.0	LEAN CLAY TO SILT (CL-ML), grayish brown, moist, low plasticity, medium stiff, trace roots/organics through 21 feet (Fill)										
5 SS	18 / 12	3 6 7	10.5							17	36	18	86	3% Gravel, 12% Sand
6 SS	18 / 14	3 7 8	12.0							19	36	14	86	0% Gravel, 6% Sand
			13.5		CL-ML									
7 SS	18 / 10	2 3 5	15.0							20				
			16.5											
8 SS	18 / 14	4 6 9	18.0							18	36	18	88	0% Gravel, 12% Sand
9	18	5	19.5							19	40	21	95	0% Gravel,

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
Aaron Kutz	Short Elliott Hendrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-21 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
SS	12	5 7	21.0	LEAN CLAY TO SILT (CL-ML), grayish brown, moist, low plasticity, medium stiff, trace roots/organics through 21 feet (Fill) *(continued)*										5% Sand
			22.5											
			24.0											
10 SS	18 12	4 7 8	25.5		CL-ML					19				
			27.0											
			28.5											
11 SS	18 18		30.0							18	33	13	99	0% Gravel, 1% Sand
				Boring Terminated at 31 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	MW-14WT

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	8/29/2022	9/20/2022	hsa,mud rotary,coring

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
WC334	125	MW-14WT	1,152.8 Feet MSL	1,247.2 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 164,748 N, 715,687 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	24		0	LEAN CLAY WITH SAND (CL), brown to light brown, moist, medium plasticity, mottled (Residuum)										
			1.5											
2 SS	18 18	3 6 7	3.0		CL									
			4.5											
3 SS	18 18	4 7 7	6.0	FAT CLAY WITH SAND (CH), light brown, moist, little gravel, stiff (Residuum)										
4 SS	18 18	4 3 6	7.5	NOTE: Mottled below 7 feet bgs.	CH					37	64	42	68	0% Gravel, 32% Sand
			9.0											
5 SS	18 6	3 6 11	10.5											
			12.0											
6 SS	18 16	3 4 8	13.5	SANDY LEAN CLAY (CL), brown, moist, trace gravel, mottled (Residuum) NOTE: Light brown sand layer <1" thick at 13.5 feet bgs.	CL									
7 SS	18 16	3 5 6	15.0	FAT CLAY (CH), brown to reddish brown, moist, little sand, stiff (Residuum) NOTE: Light brown sand layer <1" thick at 15 feet bgs.	CH									
			16.5											
8 SS	18 18	14 12 8	18.0											
9	18	6	19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
Ben Kerkt	Short Elliott Hendrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-14WT Use only as an attachment to Form 4400-122.

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	18	8 12	21.0	FAT CLAY (CH), brown to reddish brown, moist, little sand, stiff (Residuum) *(continued)*										
			22.5		CH									
			24.0											
10 SS	18 18	4 9 11	25.5											
			27.0	SANDY LEAN CLAY (CL), brown, moist, stiff	CL									
11	6		28.5											Permeability = 3.1E-08 cm/sec
SH 12 SS 13 SS	6 10 2 0 0	6 50+ 50+	30.0	DOLOSTONE, fractured, hard drilling from 28.5 to 33.5 feet, switched to mud rotary at 33.5 feet No recovery										
			31.5											
			33.0											
14 SS	0 0	50+	34.5											
			36.0											
15 RC	55.2 2.125		37.5	DOLOSTONE, light brown to buff, fine grained, <5mm vugs throughout, no bedding, slightly decomposed, trace mineralization, iron oxide staining, void from 37.0 to 39.0 feet, switched to mud rotary at 41.5 feet										Poor RQD (10%)
			39.0											
			40.5											
			42.0											
			43.5											
16 SS	0 0	50+	45.0	No recovery, void from 48.0 to 49.0 feet										
			46.5											
			48.0											
17 SS	5 4	50+	49.5	SAND, light brown, poorly graded, fine to coarse										
			51.0											
18	96		52.5											Poor RQD

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-14WT Use only as an attachment to Form 4400-122. Page 3 of 4

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
RC	39		54.0	DOLOSTONE, gray to brown, fine grained, 5 to 10mm vugs throughout with mineralization, chert at approximately 53.0 feet, very fractured, difficult coring. *(continued)*										(19.5%)
			55.5											
			57.0											
			58.5											
			60.0											
			61.5	End of coring at 60.5 feet due to formation too difficult to core.										
			63.0											
			64.5											
			66.0											
			67.5											
			69.0											
			70.5											
			72.0											
			73.5											
			75.0											
			76.5											
			78.0											
			79.5											
			81.0											
			82.5											
			84.0											
			85.5											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-14WT Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			87.0	End of coring at 60.5 feet due to formation too difficult to core. *(continued)*										
			88.5											
			90.0											
			91.5											
			93.0											
			94.5	NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 94.4 feet bgs on 9/19/2022.										
			96.0											
			97.5											
			99.0											
			100.5											
			102.0											
			103.5											
			105.0											
			106.5											
			108.0											
				Boring Terminated at 109 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	MW-15WT

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/26/2022	9/27/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
WC335	127	MW-15WT	1,136.4 Feet MSL	1,220.6 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 164,382 N, 715,726 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	24		0	SILTY SAND (SM), dark brown, moist, fine grained, trace organics (Topsoil)	SM									
			1.5	LEAN CLAY WITH SAND (CL), brown to dark brown, moist, with silt, low plasticity (Residuum)										
2 SS	18 / 14	5 6 7	3.0		CL									
3 SS	18 / 4	6 5 6	4.5											
			6.0											
4 SS	18 / 16	5 4 5	7.5	CLAYEY SAND (SC), reddish brown, moist, fine to medium grained, trace gravel (Residuum)	SC									
			9.0	LEAN CLAY WITH SAND (CL), light brown to to brown, moist, medium plasticity, stratified with light gray to red fat clay (CH) lenses < 1cm thick (Residuum) NOTE Occasional sand layers throughout sample 5. NOTE: Sample 6 highly disturbed due to gravel.										
5 SS	18 / 14	6 6 22	10.5		CL									
6 SS	18 / 14	3 4 5	12.0											
			13.5											
7 SS	18 / 16	3 3 4	15.0	FAT CLAY (CH), brown to reddish brown, moist, high plasticity, mottled, with sand (Residuum)										
			16.5											
8 SS	18 / 18	2 4 4	18.0	NOTE: Started mud rotary drilling after sample 8.	CH					46	109	73	97	0% Gravel, 3% Sand
9	18	2	19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Short Elliott Hendrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-15WT Use only as an attachment to Form 4400-122. Page 2 of 4

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	16	4 6	21.0	NOTE: Occasional clayey sand (SC) layers throughout sample 9. FAT CLAY (CH), brown to reddish brown, moist, high plasticity, mottled, with sand (Residuum) *(continued)*										
			22.5											
			24.0											
10 SS	18 18	2 4 9	25.5											
			27.0											
			28.5											
11 SS	18 16	9 8 4	30.0		CH									
			31.5											
			33.0											
12 SS	18 14	2 1 1	34.5											
			36.0											
			37.5											
			39.0											
13 SS	16 12	38 17 50	40.5	WEATHERED SANDSTONE, light brown fine grained, moderately cemented, highly to completely weathered (Saprolite).										
			42.0											
			43.5											
14 SS	14 16	10 15 50	45.0	NOTE: poorly cemented with occasional silt layers throughout sample 14.										
			46.5											
			48.0											
15 SS	13 12	15 45 50	49.5											
			51.0											
			52.5											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-15WT Use only as an attachment to Form 4400-122.

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
16 SS	18 14	32 27 24	54.0	WEATHERED SANDSTONE, light brown fine grained, moderately cemented, highly to completely weathered (Saprolite). *(continued)*										
			55.5											
			57.0											
			58.5											
			60.0											
			61.5											
			63.0											
17 SS	18 14	6 5 10	64.5											
			66.0											
			67.5											
			69.0											
18 SS	2 1	50	70.5	SANDY DOLOSTONE, light brown, moderately weathered to fresh.										
			72.0											
			73.5											
			75.0											
			76.5											
			78.0											
			79.5											
			81.0											
			82.5											
			84.0	NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 84.2 feet bgs on 9/28/2022.										
			85.5											

State of Wisconsin
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SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-15WT Use only as an attachment to Form 4400-122. Page 4 of 4

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			87.0	SANDY DOLOSTONE, light brown, moderately weathered to fresh. *(continued)*										
			88.5											
			90.0											
			91.5											
			93.0											
			94.5											
			96.0											
			97.5											
			99.0	Boring Terminated at 99 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	MW-16

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	8/22/2022	8/26/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
WC337	131	MW-16	1,103.9 Feet MSL	1,184.3 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 163,931 N, 715,671 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CU	24 -		1.5	LEAN CLAY WITH SAND (CL), brown, moist, low plasticity, occasional fine roots (Fill)										
2 SS	18 0	2 2 2	3.0											
3 SS	18 10	1 1 2	4.5											
			6.0		CL									
4 ST	24 -		7.5								43	21		
			9.0											
5 ST	24 -		10.5							24	37	16	96	0% Gravel, 4% Sand, Permeability = 3.1E-08 cm/sec
			12.0											
6 SS	18 14	2 3 3	13.5	LEAN CLAY WITH SAND (CL), brown to light brown, moist, low to medium plasticity, mottled (Residuum)										
7 SS	18 14	8 7 6	15.0	NOTE: Trace gravel below 15 feet bgs.	CL									
			16.5											
8 SS	18 18	4 4 6	18.0											
					CL									
9	18	4	19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [signature] Firm Short Elliott Hendrickson Inc. Tel: Fax:

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SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-16 Use only as an attachment to Form 4400-122.

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	18	5 6	21.0	LEAN TO FAT CLAY (CL-CH), brown to light brown, moist, medium to high plasticity, mottled, occasional clayey sand (SC) layers less than 1" thick throughout (Residuum) *(continued)*										
			22.5											
			24.0											
10 SS	18 14	4 4 5	25.5	NOTE: Occasional weathered sandstone layering at 25 to 26 feet bgs.						18	41	24	38	0% Gravel, 62% Sand
			27.0		CL									
			28.5											
11 SS	18 8	8 7 5	30.0	NOTE: Sample 11 - All Sluff.										
			31.5											
			33.0											
			34.5											
12 SS	18 8	22 28 30	36.0	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, with sand layers throughout (Saprolite) NOTE: Sample 12 - All Sluff.										
			37.5											
			39.0											
13 MC	18 -	6 15 42	40.5											
			42.0											
			43.5											
14 SS	18 16	5 8 16	45.0	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, little gravel, with sand layers throughout (Saprolite)										
			46.5											
			48.0											
15 SS	18 16	8 10 26	49.5											
			51.0											
			52.5	NOTE: Switched to mud rotary after sample 15.										

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Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-16 Use only as an attachment to Form 4400-122. Page 3 of 4

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
16 SS	5 4	50	54.0	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, little gravel, with sand layers throughout (Saprolite) *(continued)*										
			55.5											
			57.0											
			58.5											
17 SS	9 8	15 50	60.0											
			61.5											
			63.0											
18 SS	18 18	35 8 3	64.5	WEATHERED SHALE, brown, moist, highly to completely weathered, little gravel (Saprolite)										
			66.0											
			67.5											
			69.0											
19 SS	3 3	50	70.5	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, little gravel, with sand layers throughout (Saprolite) NOTE: Borehole lost water at 70 feet to termination.										
			72.0											
			73.5											
20 SS	18 18	3 9 25	75.0	NOTE: 6" layer of weathered shale at 75 feet bgs.										
			76.5											
			78.0											
21 SS	1 1	50	79.5	SANDY DOLOSTONE, brown to light brown, moist, fresh to moderately weathered NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 80.4 feet bgs on 8/26/2022.										
			81.0											
			82.5											
			84.0											
22 SS	1 1	50	85.5											

State of Wisconsin
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SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-16 Use only as an attachment to Form 4400-122.

Sample										Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			87.0	SANDY DOLOSTONE, brown to light brown, moist, fresh to moderately weathered *(continued)*										
			88.5											
23 SS	4 2	50	90.0											
			91.5											
			93.0											
24 SS	1 1	50	94.5											
			96.0											
			97.5											
				Boring Terminated at 98 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	MW-16WT

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/20/2022	9/21/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
WC336	129	MW-16WT	1,116.3 Feet MSL	1,184.7 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 163,940 N, 715,674 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1.5	See MW-16 for description.										
			3.0											
			4.5											
			6.0											
			7.5											
			9.0											
			10.5											
			12.0											
			13.5											
			15.0											
			16.5											
			18.0											
			19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	Short Elliott Hendrickson Inc.	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-16WT Use only as an attachment to Form 4400-122.

Sample										Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			21.0	See MW-16 for description. *(continued)*										
			22.5											
			24.0											
			25.5											
			27.0											
			28.5											
			30.0											
			31.5											
			33.0											
			34.5											
			36.0											
			37.5											
			39.0											
			40.5											
			42.0											
			43.5											
			45.0											
			46.5											
			48.0											
			49.5											
			51.0											
			52.5											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-16WT Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			54.0	See MW-16 for description. *(continued)*										
			55.5											
			57.0											
			58.5											
			60.0											
			61.5											
			63.0											
			64.5											
			66.0											
			67.5											
			69.0	NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 68.4 feet bgs on 8/24/2022.										
			70.5											
			72.0											
			73.5											
			75.0											
				Boring Terminated at 76 feet.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon County Landfill Expansion	3268	MW-17WT

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Braun Intertec	9/21/2022	9/23/2022	hsa,mud rotary

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
WC338	133	MW-17WT	1,116.5 Feet MSL	1,196.4 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 163,691 N, 715,688 E S / C / N
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
3268	Vernon	63	Viroqua

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 AU	18		0	LEAN CLAY WITH SAND (CL), brown (Residuum)	CL									
			1.5											
2 SS	18 18	5 9 6	3.0	CLAYEY SAND (SC), brown, rock fragments at 4.5 to 6 and 7 to 8.5 feet bgs, poorly graded sand seam (1 inch) at 8.4 feet, rough drilling from 7.5 to 8 feet bgs (Residuum).										
3 SS	18 12	10 28 20	4.5 6.0		SC					20	59	40	43	13% Gravel, 45% Sand
4 SS	18 18	14 10 12	7.5 9.0							17	39	27	43	9% Gravel, 48% Sand
5 SS	18 18	10 10 10	10.5							16	41	29	48	0% Gravel, 52% Sand
				WEATHERED SANDSTONE, light brown, very friable, iron oxide staining (Saprolite).										
6 SS	18 18	14 14 25	12.0 13.5											
7 SS	18 18	24 24 40	15.0 16.5											
8 SS	18 18	15 9 10	18.0											
9 ☒	18	7	19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
Ben Kerkstra	Short Elliott Hendrickson Inc.	Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-17WT Use only as an attachment to Form 4400-122.

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	18	14 34	21.0	WEATHERED SANDSTONE, light brown, very friable, iron oxide staining (Saprolite). *(continued)*										
			22.5											
			24.0											
10 SS	18 18	12 14 16	25.5											
			27.0											
			28.5											
11 SS	18 14	4 5 11	30.0											
			31.5											
			33.0											
			34.5	WEATHERED SANDSTONE, Dark brown, very friable, iron oxide staining (Saprolite).										
12 SS	18 16	10 15 32	36.0	WEATHERED SANDSTONE, brown to dark brown, clayey, very friable (Saprolite).										
			37.5											
			39.0											
13 SS	18 14	8 6 6	40.5											
			42.0											
			43.5											
14 SS	18 8	35 50+	45.0											
			46.5											
			48.0											
15 SS	18 8	10 10 17	49.5											
			51.0											
			52.5											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-17WT Use only as an attachment to Form 4400-122. Page 3 of 4

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			54.0	WEATHERED SANDSTONE, brown to dark brown, clayey, very friable (Saprolite). *(continued)*										
16 SS	18 18	10 14 16	55.5											
			57.0											
			58.5											
17 SS	18 8	14 10 10	60.0											
			61.5											
			63.0											
18 SS	18 1	50+	64.5											
			66.0	SANDSTONE, brown to dark brown, clayey, very friable.										
			67.5											
			69.0											
			70.5											
			72.0											
			73.5											
			75.0											
			76.5											
			78.0											
			79.5	NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 79.9 feet bgs on 9/26/2022.										
			81.0											
			82.5											
			84.0											
			85.5											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-17WT Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			87.0	SANDSTONE, brown to dark brown, clayey, very friable. *(continued)*										
			88.5											
			90.0											
			91.5											
			93.0	Boring Terminated at 93 feet.										

Appendix L

Geotechnical Laboratory Reports

Central Wisconsin
Engineers

P. O. BOX F • SCHOFIELD, WI 54476 • (715) 842-9500

FINAL TEST INFORMATION

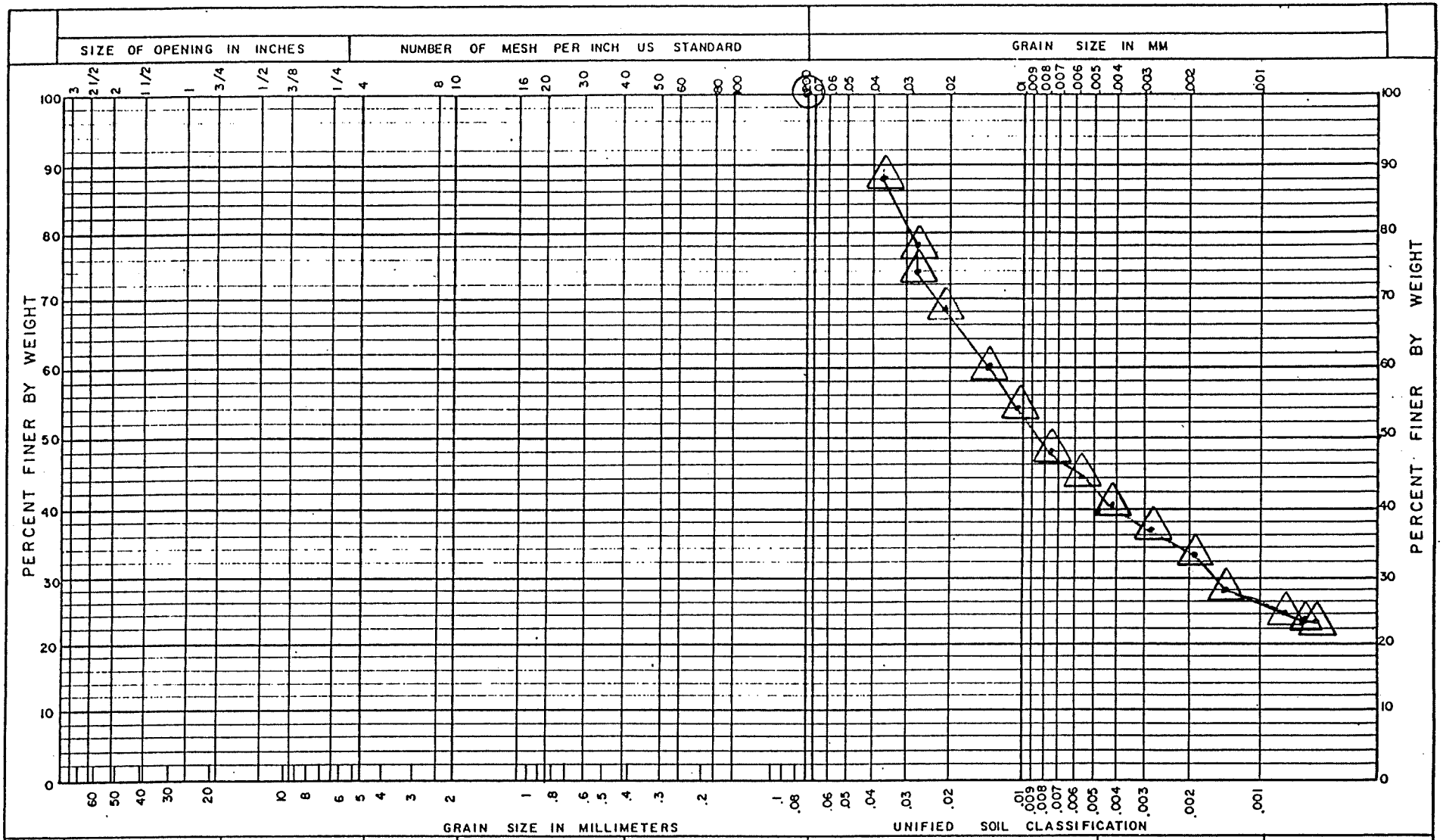
PROJECT: Vernon County Proposed Landfill **JOB NO.** 57786 **DATE** June 3, 1988

Boring No.	Sample No.	Depth	Field Class	GRADATION - % PASSING									LL	PI	USCS	Wn %	e	Yd P.C.F.	GS	k -(CM/S)
				.005	.02	200	100	#40	#10	#4	3/8"	3/4"								
TB-1		.5' - 9.5'		20.0	55.0	96.9	98.2	99.7	100	-	-	-	31.5	8.6	CL					2.44×10^{-7}
TB-1		9.5' - 10.5'		42	68								51.8	35.2	CL					
TB-1		10.5' - 12'				44.6	54.37	91.4	99.97	100	-	-			SC					
TB-1		12' - 13'				49.4	53.5	93.7	100	-	-	-			SC					
TB-3		1.5' - 6.0'		42	67								47.1	27.9	CL					2.34×10^{-8}
TB-3		8.5' - 13.0'		52	72	58.7	66.5	85.7	93.0	96.0	100	-	48.5	29.77	CL					
TB-4		2' - 4'		50	68								53.4	33.8	CL					
TB-4		7' - 8'				18.8	23.8	65.7	87.6	93.3	100	-			SC					
TB-5		2.0' - 7.5'		69	86								55.3	32.2	CL					1.13×10^{-6}
TB-5		7.5' - 10.0'				36.6	40.6	82.3	99.2	99.8	100	-			SC					
TB-6		8' - 13.5'		47	72										CL					
TB-7		2.5' - 16.0'		24	59								32.3	12.15	CL					
TB-8		2.0' - 6.5'		26	56								37.8	14.5	CL					
TB-8		6.5' - 12.0'		49	68	18.17	25.0	78.1	98.8	99.5	100	-			SC					1.35×10^{-2}
TB-8		14' - 22'				37.9	43.1	77.7	85.7	89.8	100	-			SC					2.96×10^{-7}
TB-9		1.5' - 9.0'		24.0	62.0							-	25.4	8.1	CL					
TB-9		10' - 22'				12.1	20.2	82.1	96.7	98.3	100	-			SM					

Central Wisconsin
Engineers

GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill, Klahn Site
DATE: May 6, 1988
JOB NO: 57786



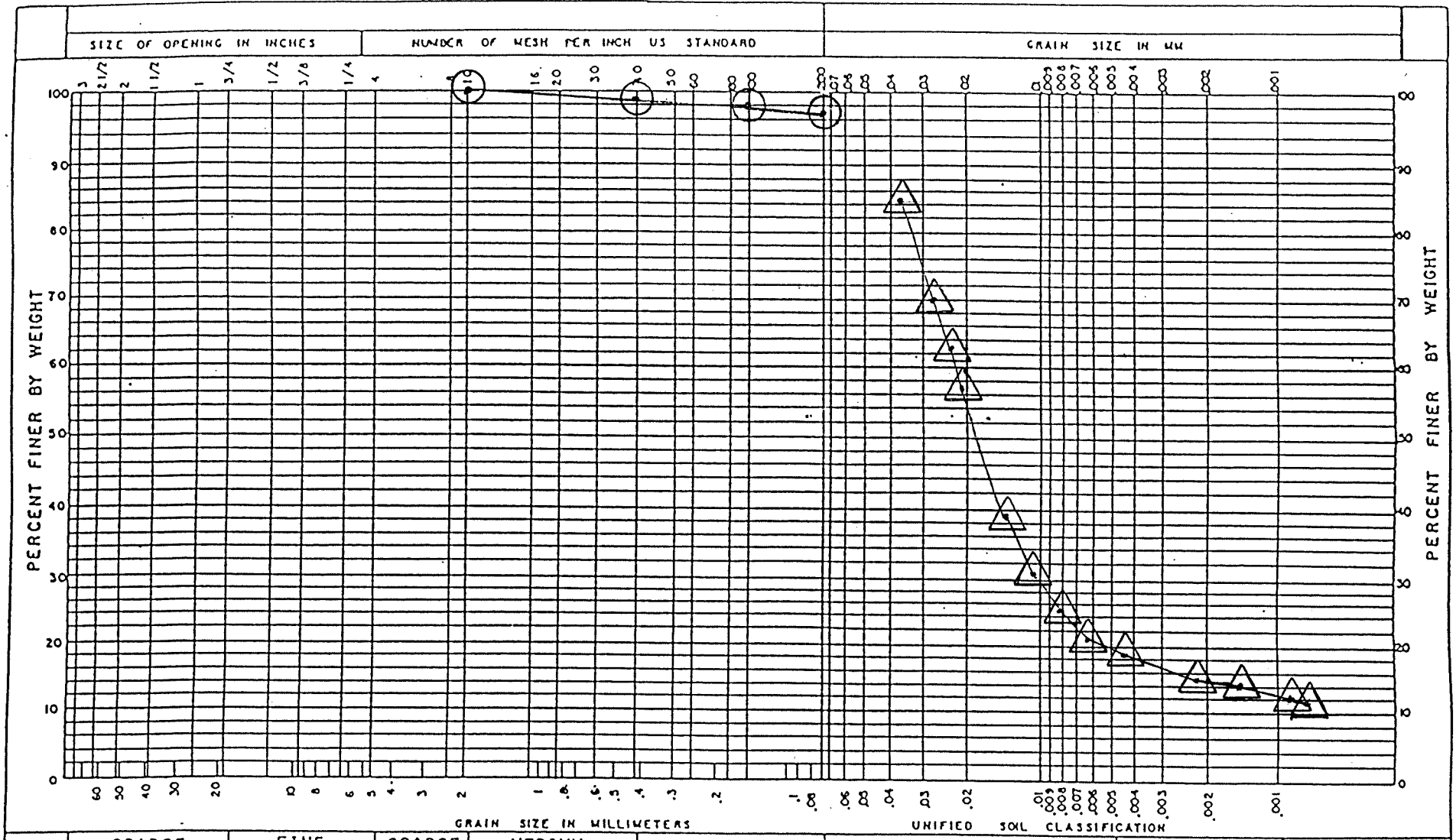
BORING NO. TB-1	GRAVEL	F. SAND	D_{60}	C_U	⊙ MECHANICAL
SAMPLE NO. 4	C. SAND	SILT 58%	D_{30}	C_z	△ HYDROMETER
DEPTH 9.5'-10.5'	M. SAND	CLAY 42%	D_{10}	UNIFIED CLASS CH	
ELEV. 1224.43-1225.43					

Central Wisconsin
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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill
Klahn Site TB-1 2'-5'
DATE: May 6, 1988
JOB NO: 57786



BORING NO. TB-1
SAMPLE NO. 1
DEPTH 2'-5'
ELEV. 1229.93-1232.93

GRAVEL
C. SAND
M. SAND .3%
F. SAND 2.8%
SILT 96.9% - 80% Silt
CLAY - 20% Clay

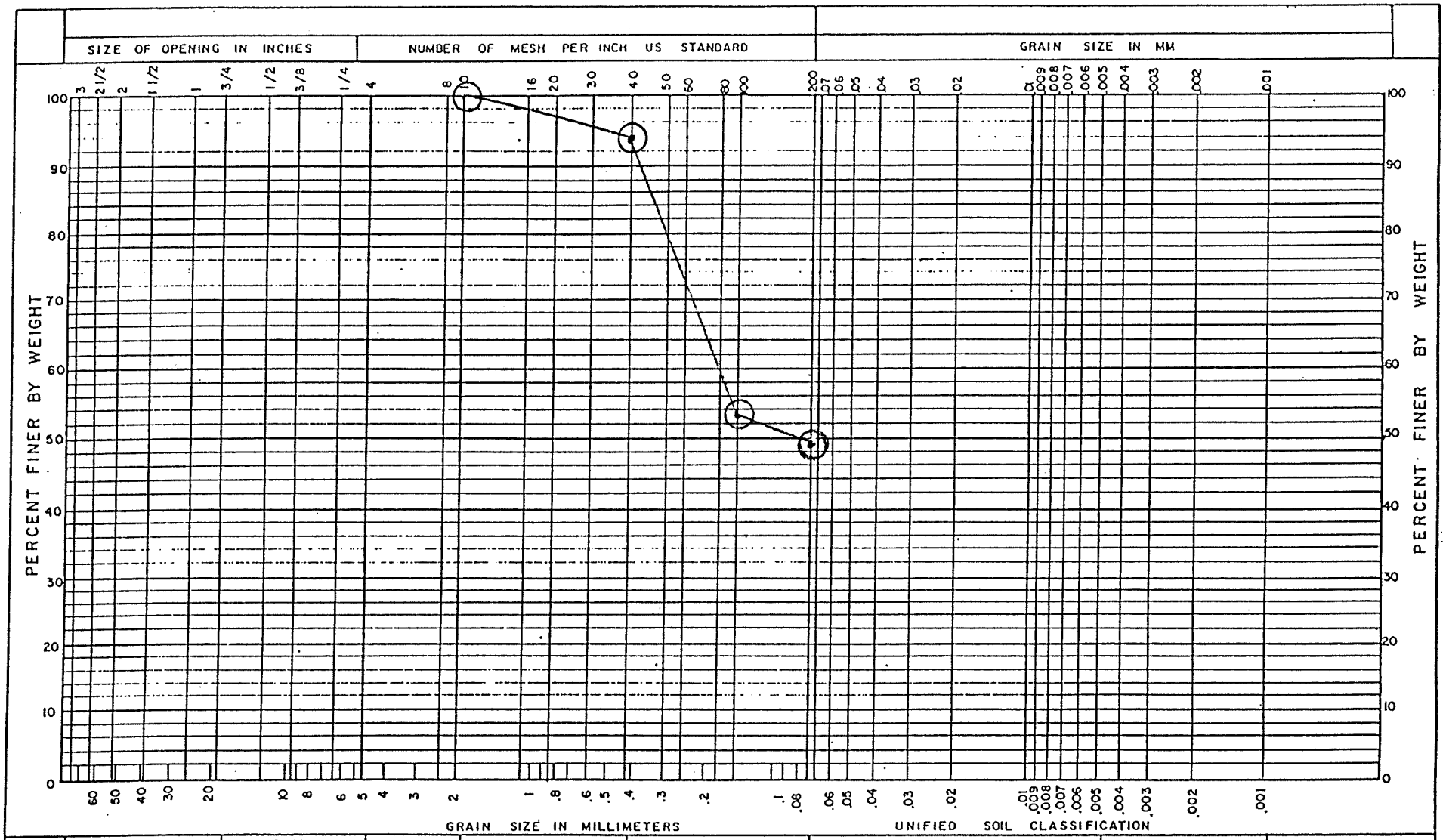
D_{60}
D_{30}
D_{10}
C_U
C_z
UNIFIED CLASS CL

⊙ MECHANICAL
△ HYDROMETER

Central Wisconsin
Engineers

GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill
Site
DATE: June 2, 1988
JOB NO: 57786



BORING NO. TB-1	GRAVEL 0.0	F. SAND 44.31%	D_{60}	C_U	⊙ MECHANICAL
SAMPLE NO.	C. SAND 0.0	SILT	D_{30}	C_z	△ HYDROMETER
DEPTH 12' - 13'	M. SAND 6.29%	CLAY 49.4%	D_{10}	UNIFIED CLASS SC	
ELEV. 1222.93 - 1221.93					

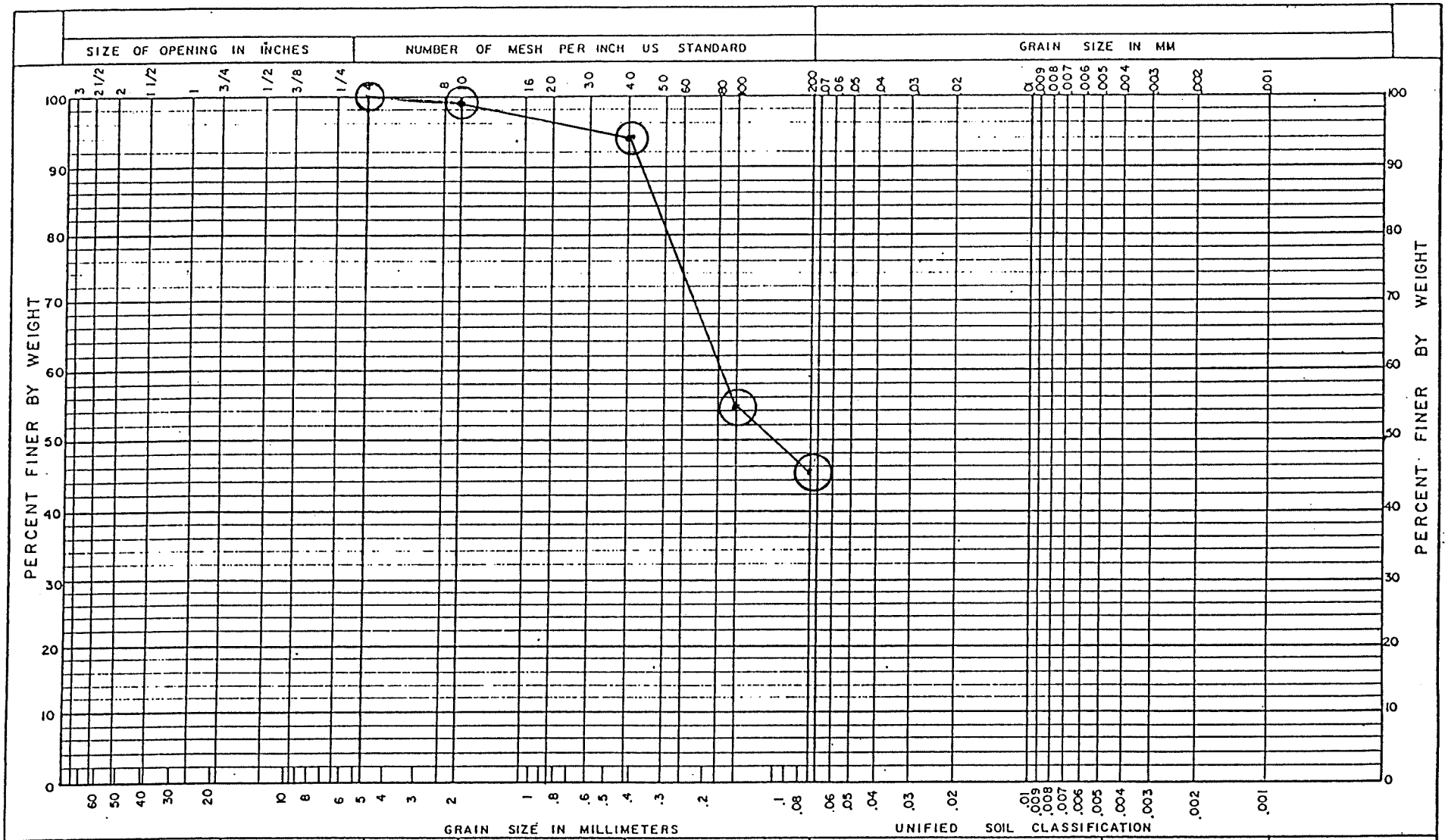
Central Wisconsin
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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County, Klahn Site

DATE: May 11, 1988

JOB NO: 57786



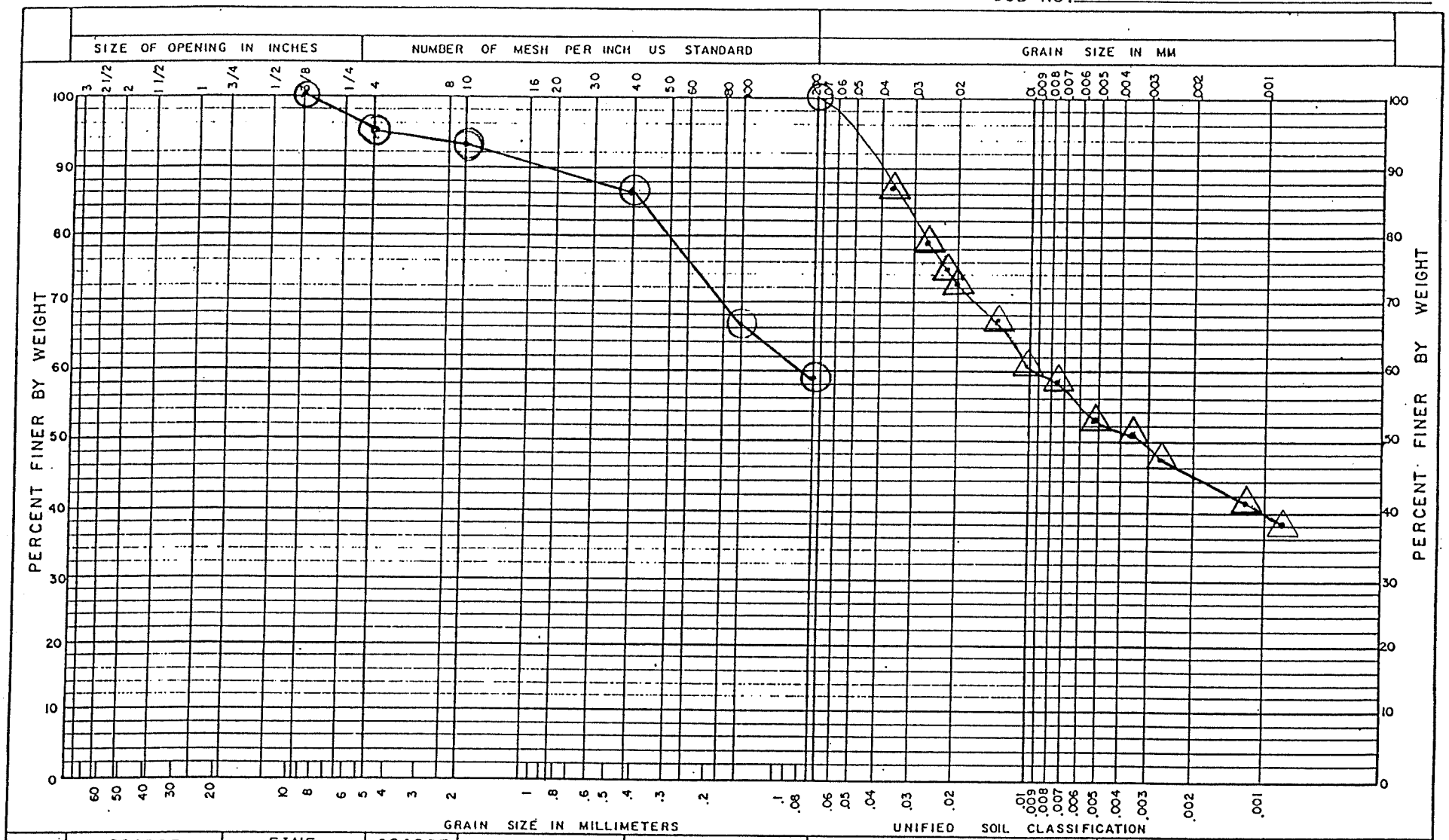
BORING NO. TB-1	GRAVEL		F. SAND 49.55%	D_{60}	C_U
SAMPLE NO. 5	C. SAND .3%		SILT 44.57%	D_{30}	C_z
DEPTH 10.5' - 12.0'	M. SAND 5.85%		CLAY	D_{10}	UNIFIED CLASS SC
ELEV. 1222.93 - 1224.43					

⊙ MECHANICAL
△ HYDROMETER

Central Wisconsin
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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill Site
DATE: June 1, 1988
JOB NO: 57786



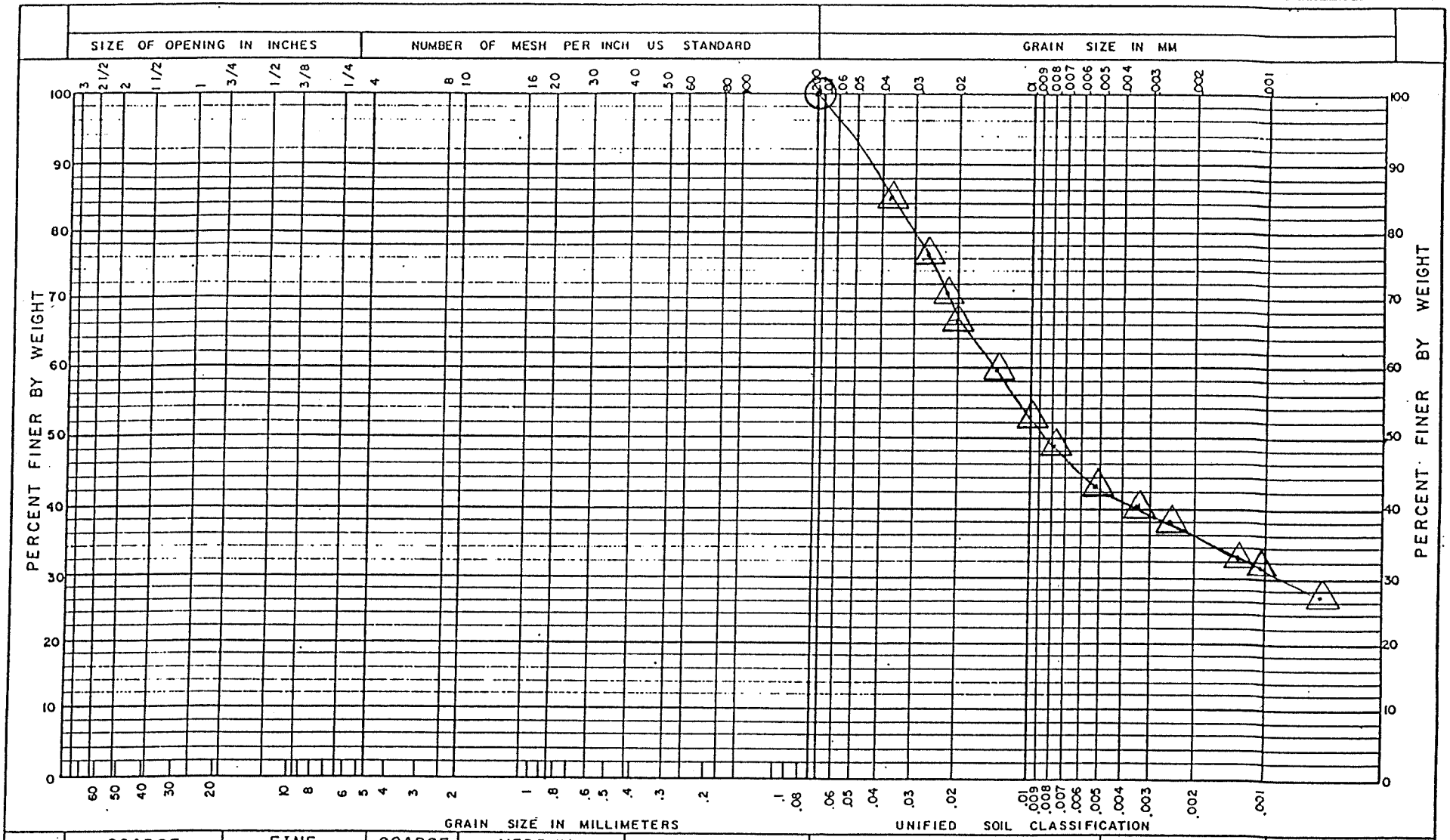
BORING NO.	TB-3	GRAVEL	4%	F. SAND	27%	D_{60}	C_U
SAMPLE NO.		C. SAND	3%	SILT	58.7% - 48% Silt	D_{30}	C_z
DEPTH	8.5' - 13.0'	M. SAND	7.3%	CLAY	- 52% Clay	D_{10}	UNIFIED CLASS CL
ELEV.	1244.85 - 1240.35						

⊙ MECHANICAL
△ HYDROMETER

Central Wisconsin
Engineers

GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill Site
DATE: May 26, 1988
JOB NO: 57786



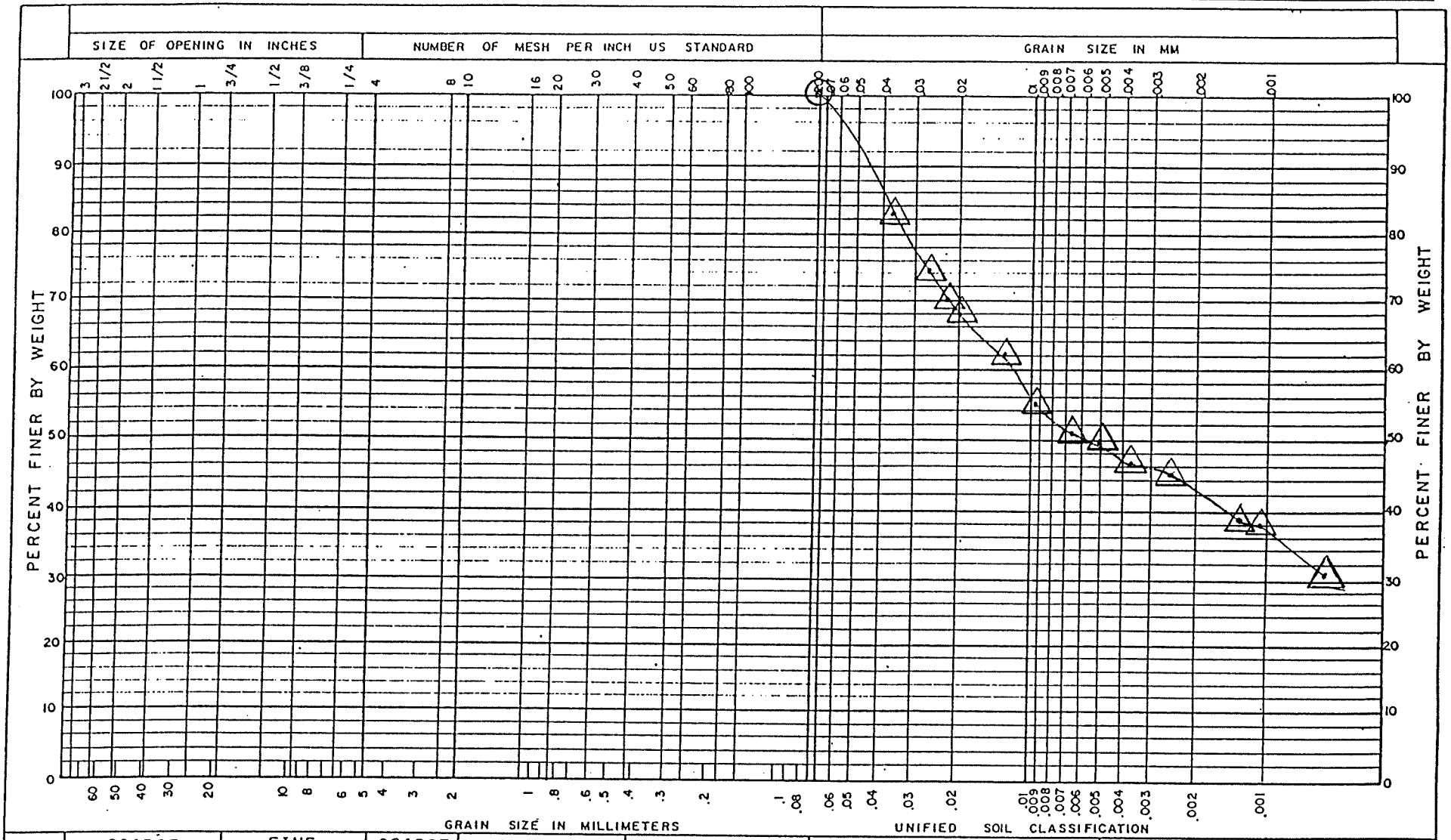
BORING NO.	TB-3	GRAVEL		F. SAND	D_{60}	C_U
SAMPLE NO.	2 & 3	C. SAND		SILT 58%	D_{30}	C_z
DEPTH	1.5' - 6.0'	M. SAND		CLAY 42%	D_{10}	UNIFIED CLASS CL
ELEV.	1251.85 - 1247.35					

⊙ MECHANICAL
△ HYDROMETER

Central Wisconsin
Engineers

GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill Site
DATE: May 26, 1988
JOB NO: 57786

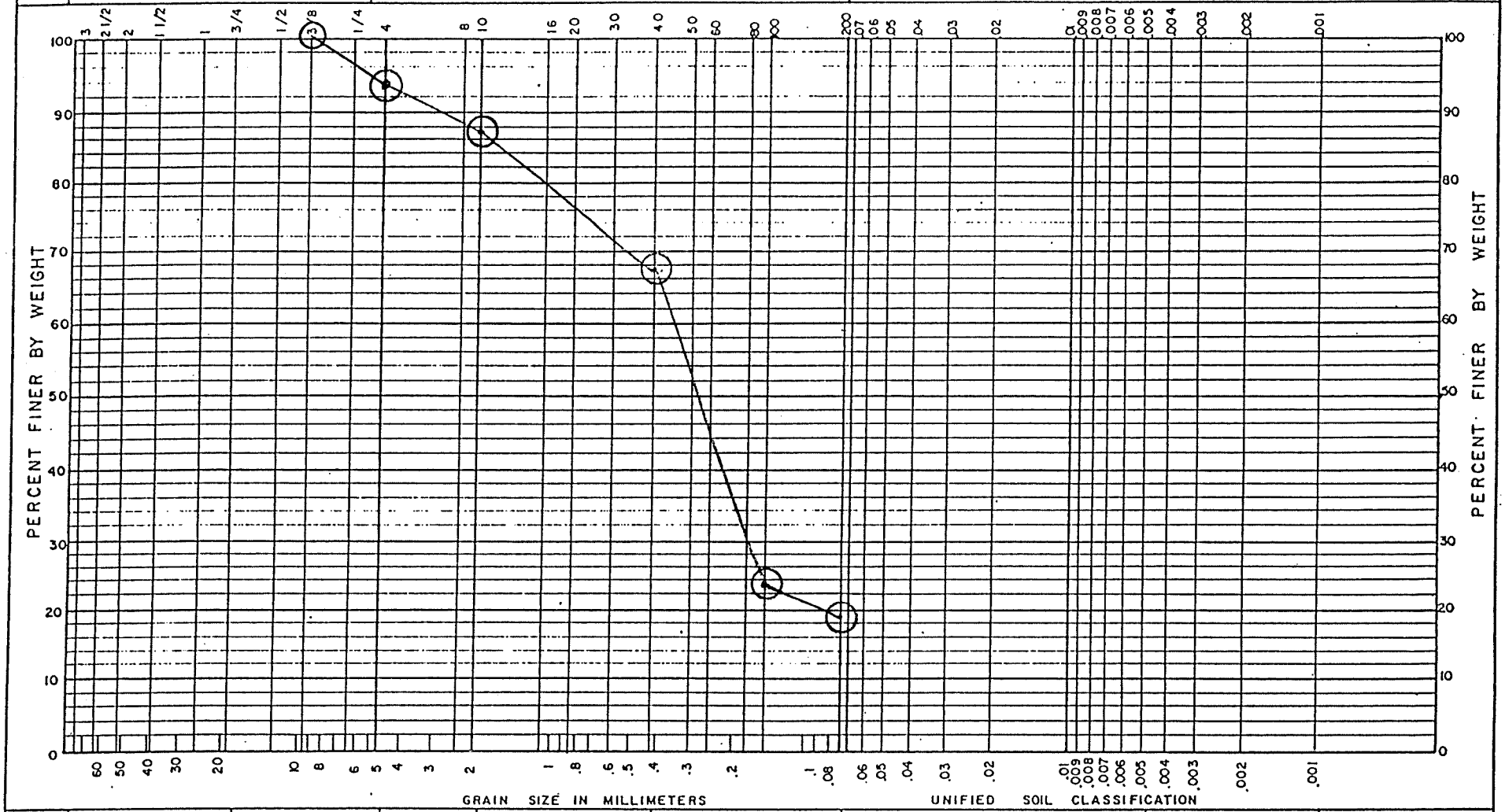


BORING NO. TB-4	GRAVEL	F. SAND	D_{60}	C_U	⊙ MECHANICAL
SAMPLE NO. 2	C. SAND	SILT 50%	D_{30}	C_z	△ HYDROMETER
DEPTH 2' - 4'	M. SAND	CLAY 50%	D_{10}	UNIFIED CLASS CH	
ELEV. 1230.9' - 1228.9'					

Central Wisconsin
Engineers

GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill Site
DATE: June 2, 1988
JOB NO: 57786



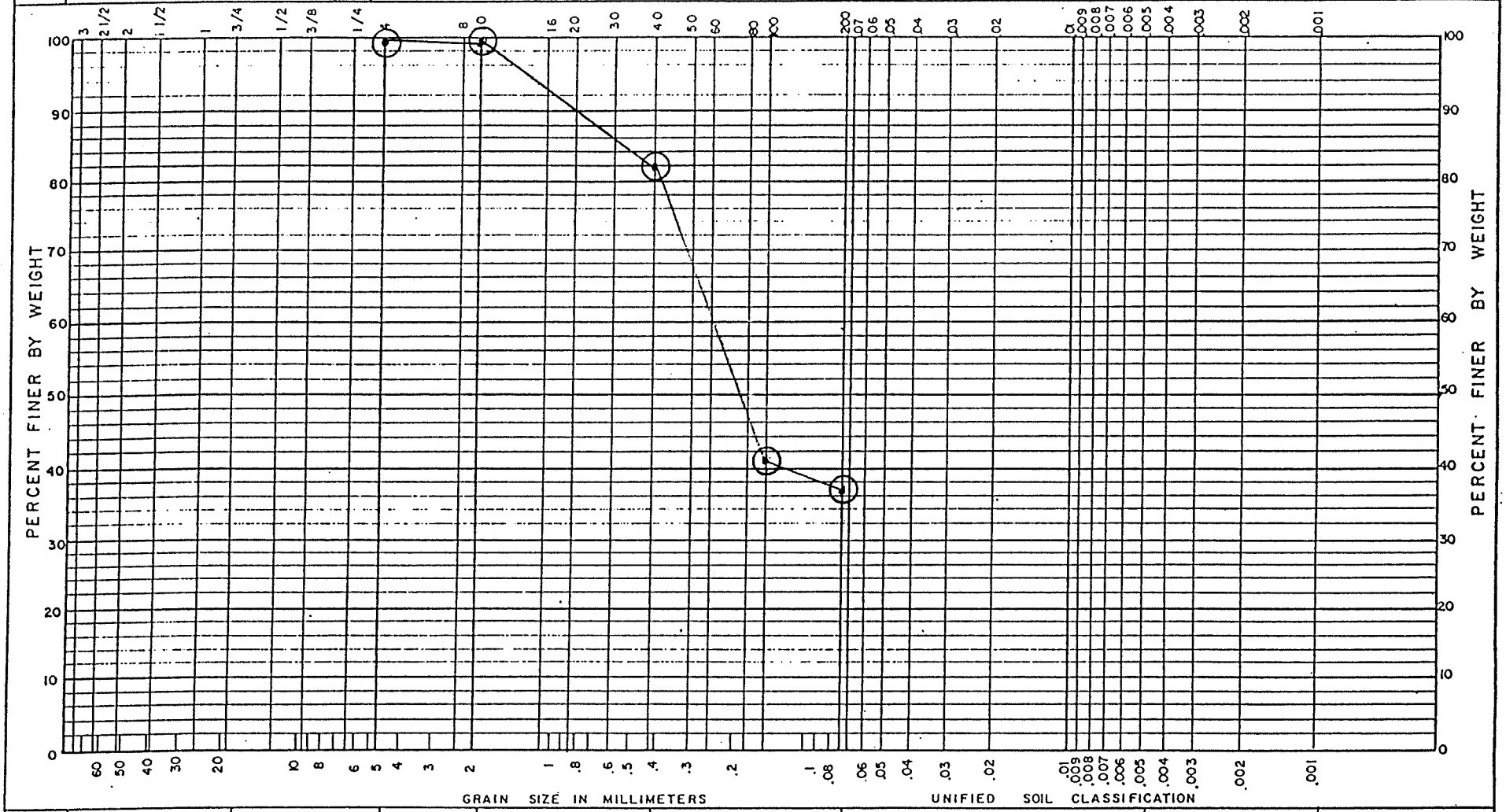
BORING NO.	TB-4	GRAVEL	6.7%	F. SAND	46.9%	D_{60}	C_U
SAMPLE NO.		C. SAND	5.7%	SILT	18.8%	D_{30}	C_z
DEPTH	7' - 8'	M. SAND	21.9%	CLAY		D_{10}	UNIFIED CLASS SC
ELEV.	1225.9 - 1224.9						

⊙ MECHANICAL
△ HYDROMETER

Central Wisconsin
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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill Site
DATE: June 1, 1988
JOB NO: 57786

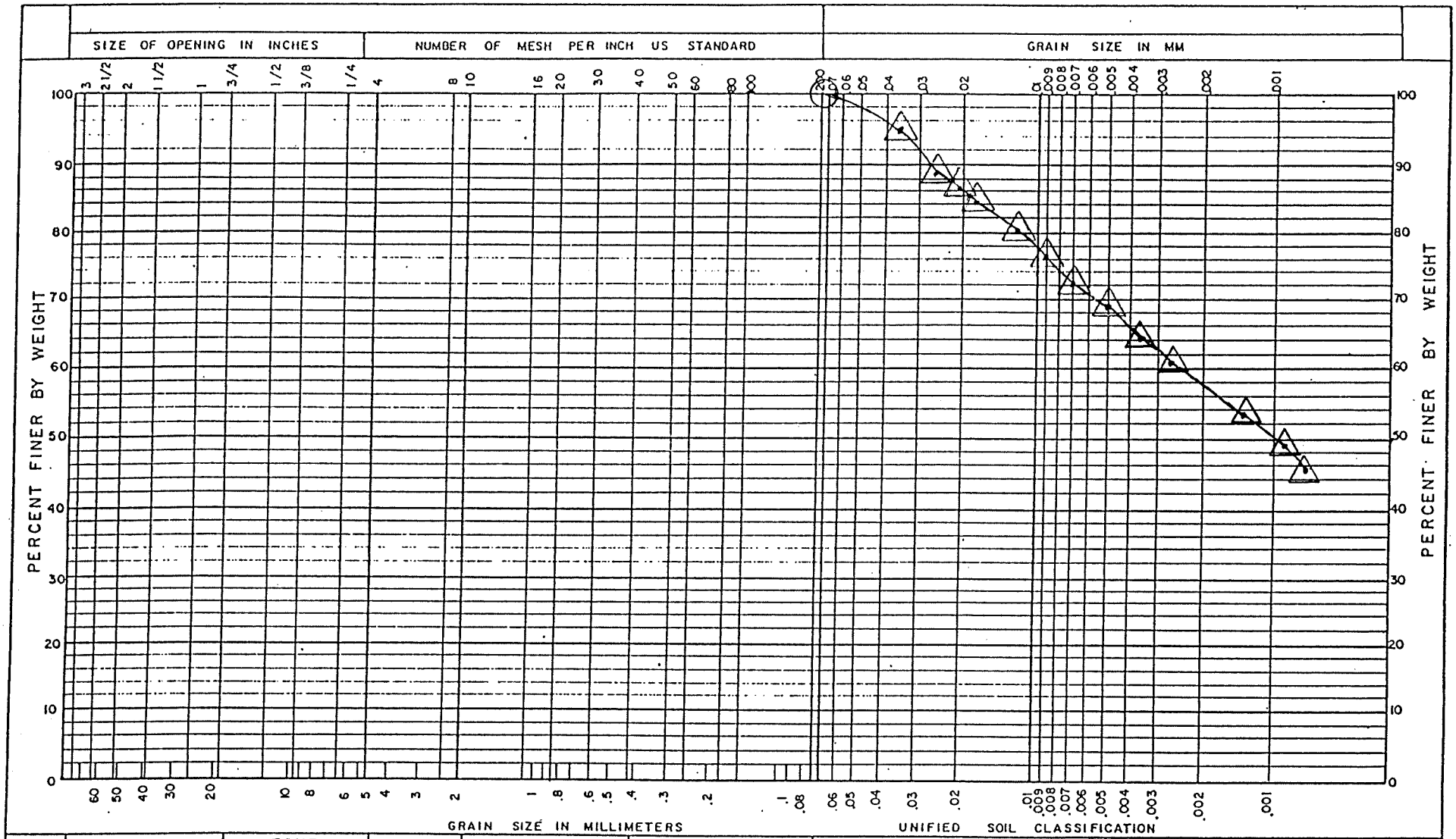


BORING NO. TB-5	GRAVEL 0.0	F. SAND 45.7%	D_{60}	C_U	⊙ MECHANICAL
SAMPLE NO.	C. SAND .8%	SILT			△ HYDROMETER
DEPTH 7.5' - 10.0'	M. SAND 16.9%	CLAY 36.6	D_{30}	C_z	
ELEV. 1213.5 - 1211.0			D_{10}	UNIFIED CLASS SC	

Central Wisconsin
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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill Site
DATE: May 31, 1988
JOB NO: 57786

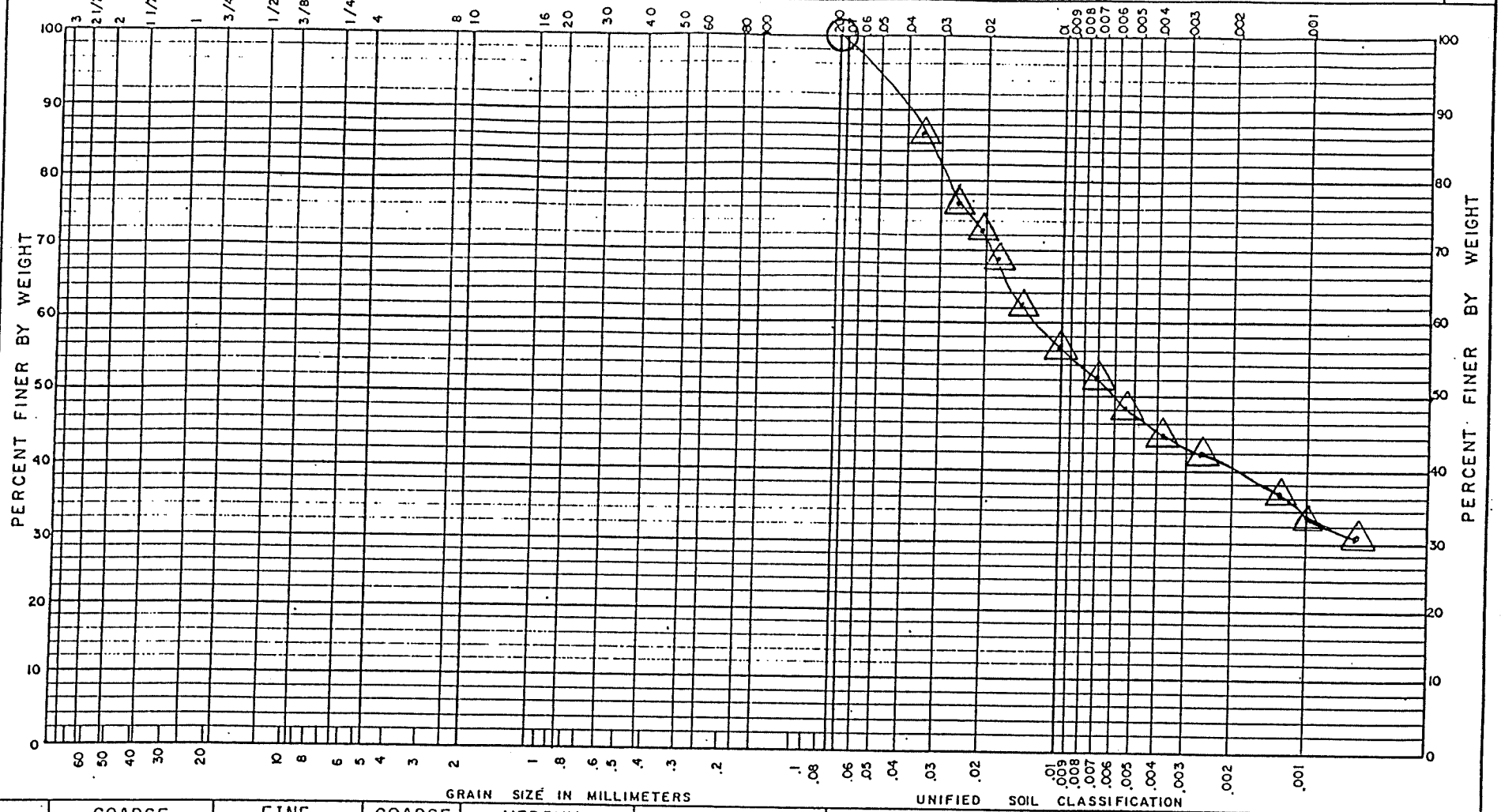


BORING NO. TB-5	GRAVEL	F. SAND		D_{60}	C_U	⊙ MECHANICAL
SAMPLE NO.	C. SAND	SILT	31%	D_{30}	C_z	△ HYDROMETER
DEPTH 2.0' - 7.5'	M. SAND	CLAY	69%	D_{10}	UNIFIED CLASS	CH
ELEV. 1219 - 1213.5						

Central Wisconsin
Engineers

GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill Site
DATE: May 26, 1988
JOB NO: 57786



BORING NO. TB-6
SAMPLE NO. 5 to 7
DEPTH 8' - 13.5'
ELEV. 1210.7 - 1205.20

GRAVEL
C. SAND
M. SAND
F. SAND
SILT 53%
CLAY 47%

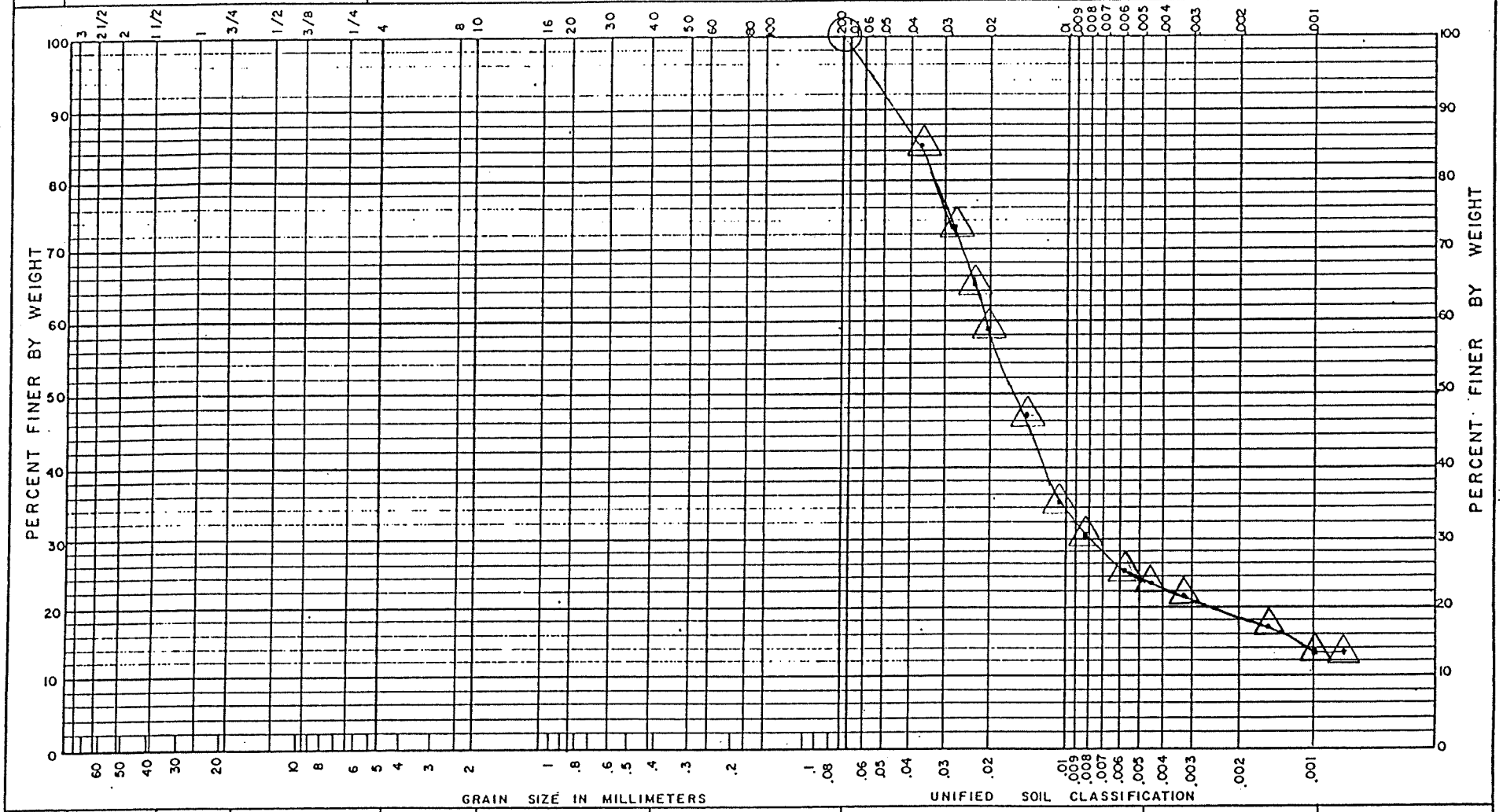
D_{60}
D_{30}
D_{10}
C_U
C_z
UNIFIED CLASS CL

⊙ MECHANICAL
△ HYDROMETER

Central Wisconsin
Engineers

GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill
DATE: May 31, 1988
JOB NO: 57786



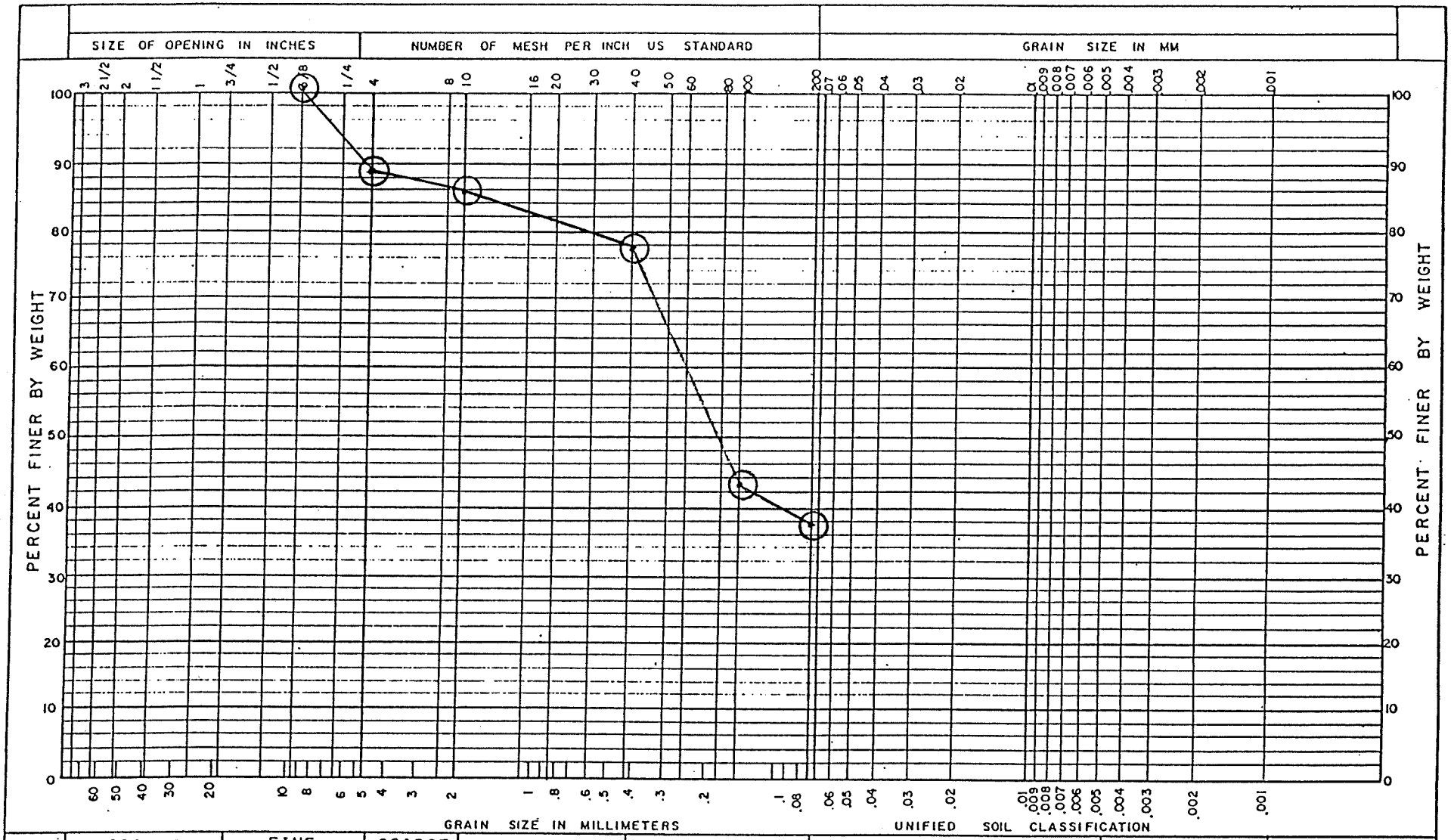
BORING NO.	TB-7	GRAVEL	F. SAND		D_{60}	C_U
SAMPLE NO.		C. SAND	SILT	78%	D_{30}	C_z
DEPTH	2.5' - 16.0'	M. SAND	CLAY	22%	D_{10}	UNIFIED CLASS CL
ELEV.	1240.78 - 1229.28					

⊙ MECHANICAL
△ HYDROMETER

Central Wisconsin
Engineers

GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill Site
DATE: June 2, 1988
JOB NO: 57786

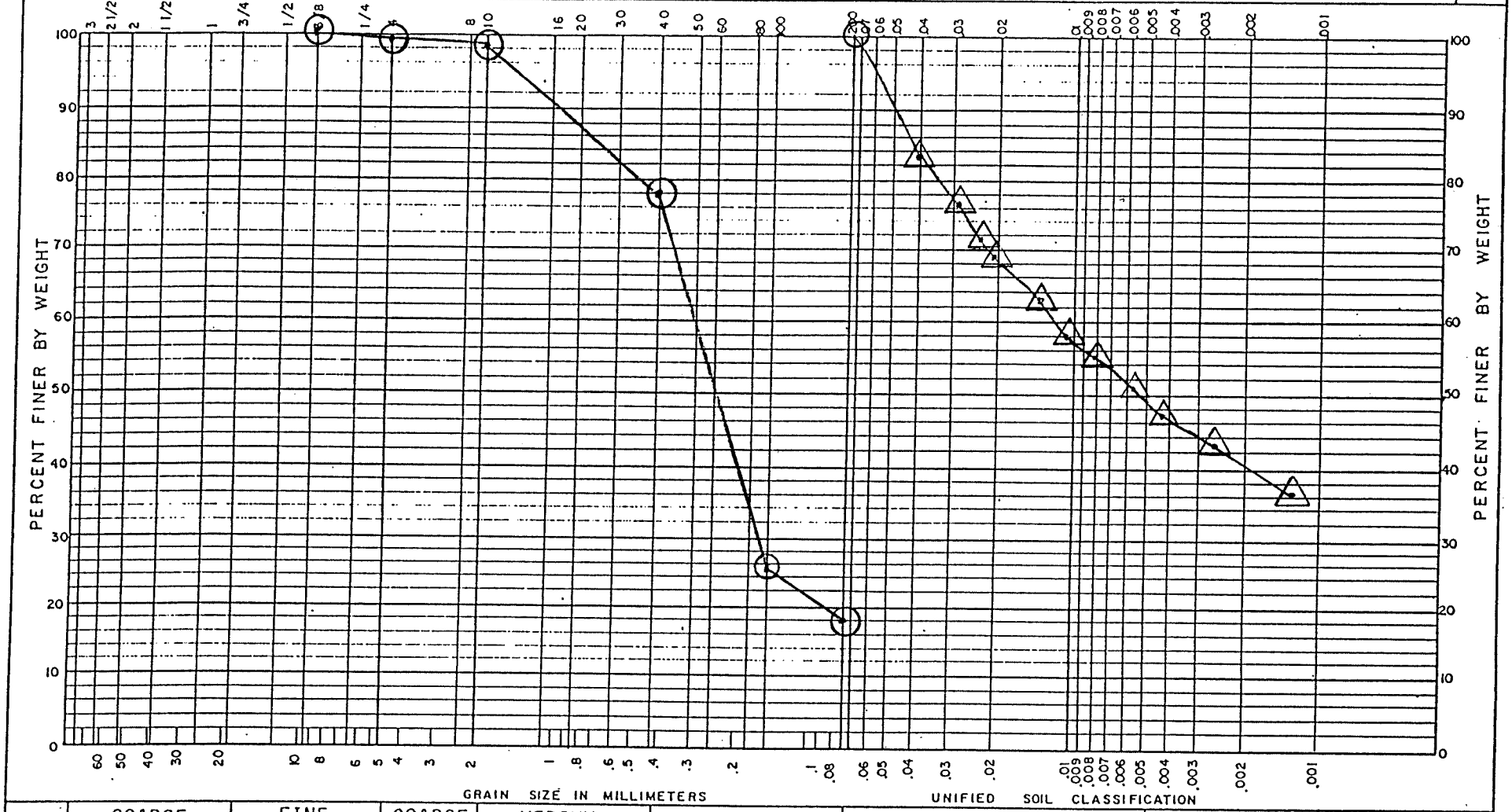


BORING NO. TB-8	GRAVEL 10.25%	F. SAND 39.75%	D_{60}	C_U	⊙ MECHANICAL
SAMPLE NO.	C. SAND 4.05%	SILT			△ HYDROMETER
DEPTH 14' - 22.0'	M. SAND 8.02%	CLAY 37.93%	D_{30}	C_z	
ELEV. 1235.42 - 1227.42			D_{10}	UNIFIED CLASS SC	

Central Wisconsin
Engineers

GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill Site
DATE: June 2, 1988
JOB NO: 57786



BORING NO.	TB-8	GRAVEL	.47%	F. SAND	59.91%	D_{60}
SAMPLE NO.		C. SAND	.71%	SILT	18.17% - 51% Silt	D_{30}
DEPTH	6.5' - 12.0'	M. SAND	20.74%	CLAY	- 49% Clay	D_{10}
ELEV.	1242.92 - 1237.42					

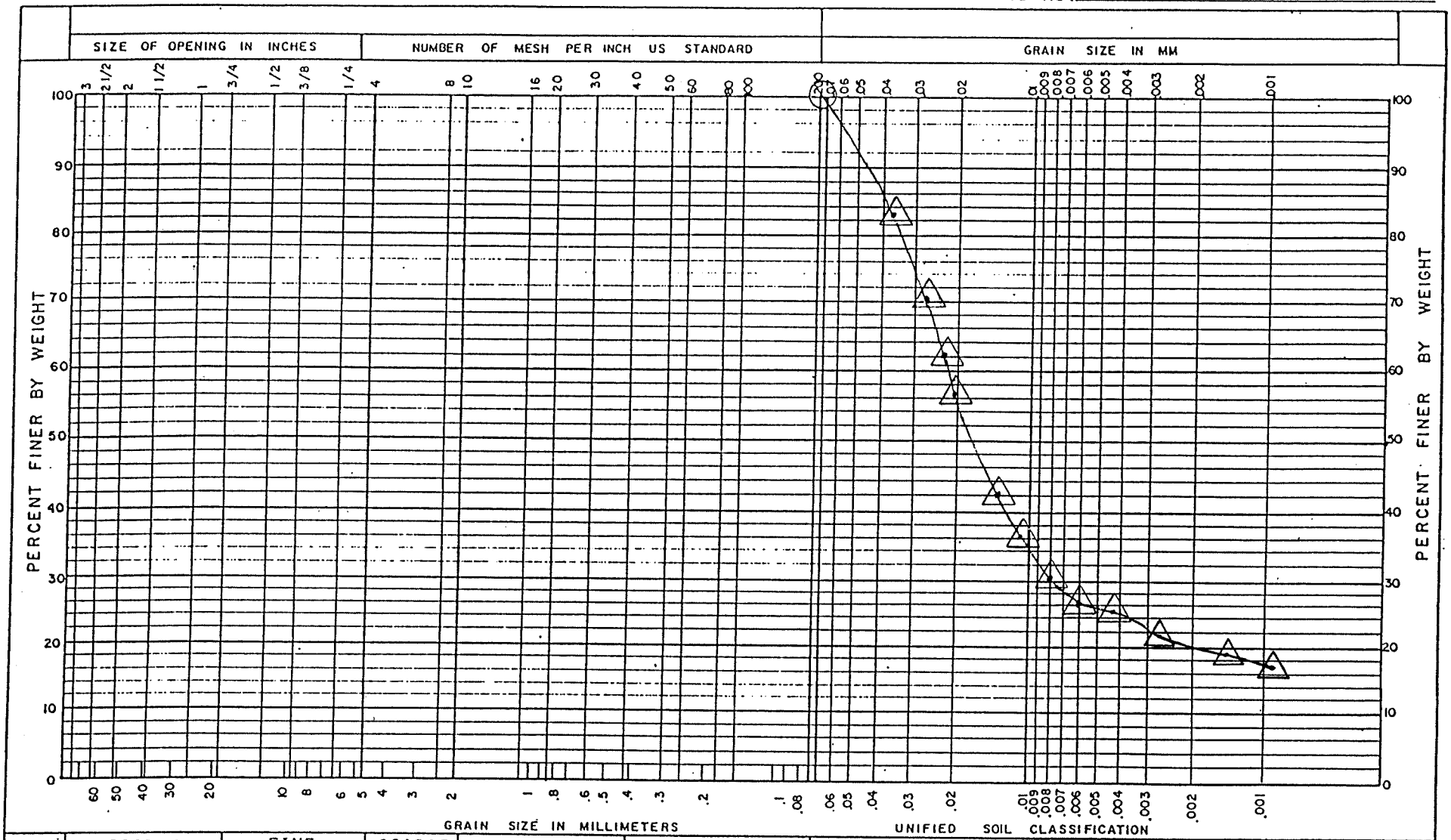
C_U
C_z
UNIFIED CLASS SC

⊙ MECHANICAL
△ HYDROMETER

Central Wisconsin
Engineers

GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill Site
DATE: May 31, 1988
JOB NO: 57786

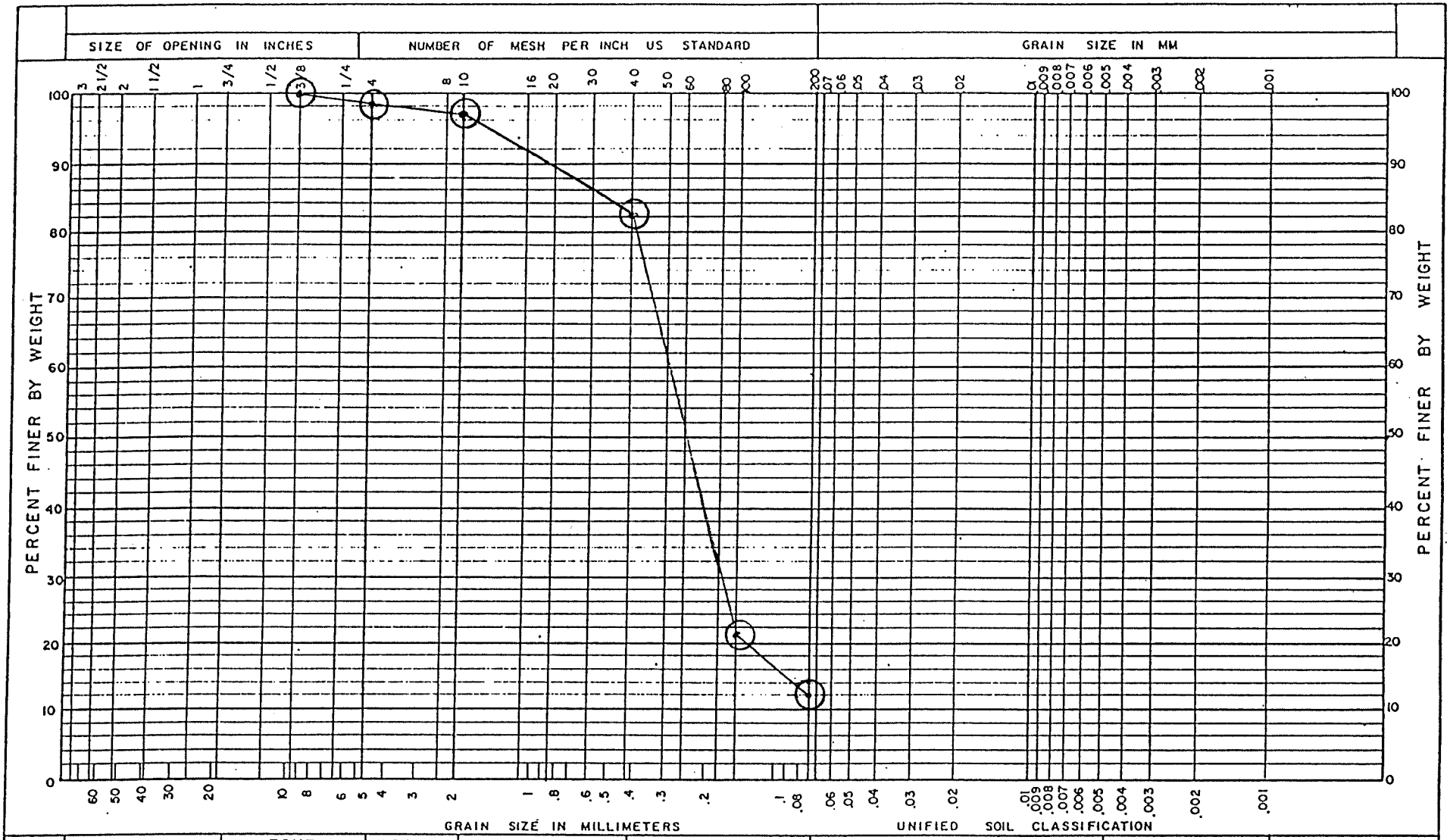


BORING NO. TB-8	GRAVEL	F. SAND		D_{60}	C_U	⊙ MECHANICAL
SAMPLE NO.	C. SAND	SILT	74%	D_{30}	C_z	△ HYDROMETER
DEPTH 2.0' - 6.5'	M. SAND	CLAY	26%	D_{10}	UNIFIED CLASS	CL
ELEV. 1247.42 - 1242.92						

Central Wisconsin
Engineers

GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill Site
DATE: June 2, 1988
JOB NO: 57786



BORING NO. TB-9
SAMPLE NO.
DEPTH 10'-22'
ELEV. 1226.19-1214.19

GRAVEL 1.7%
C. SAND 1.62%
M. SAND 14.61%
F. SAND 70%
SILT
CLAY 12.1%

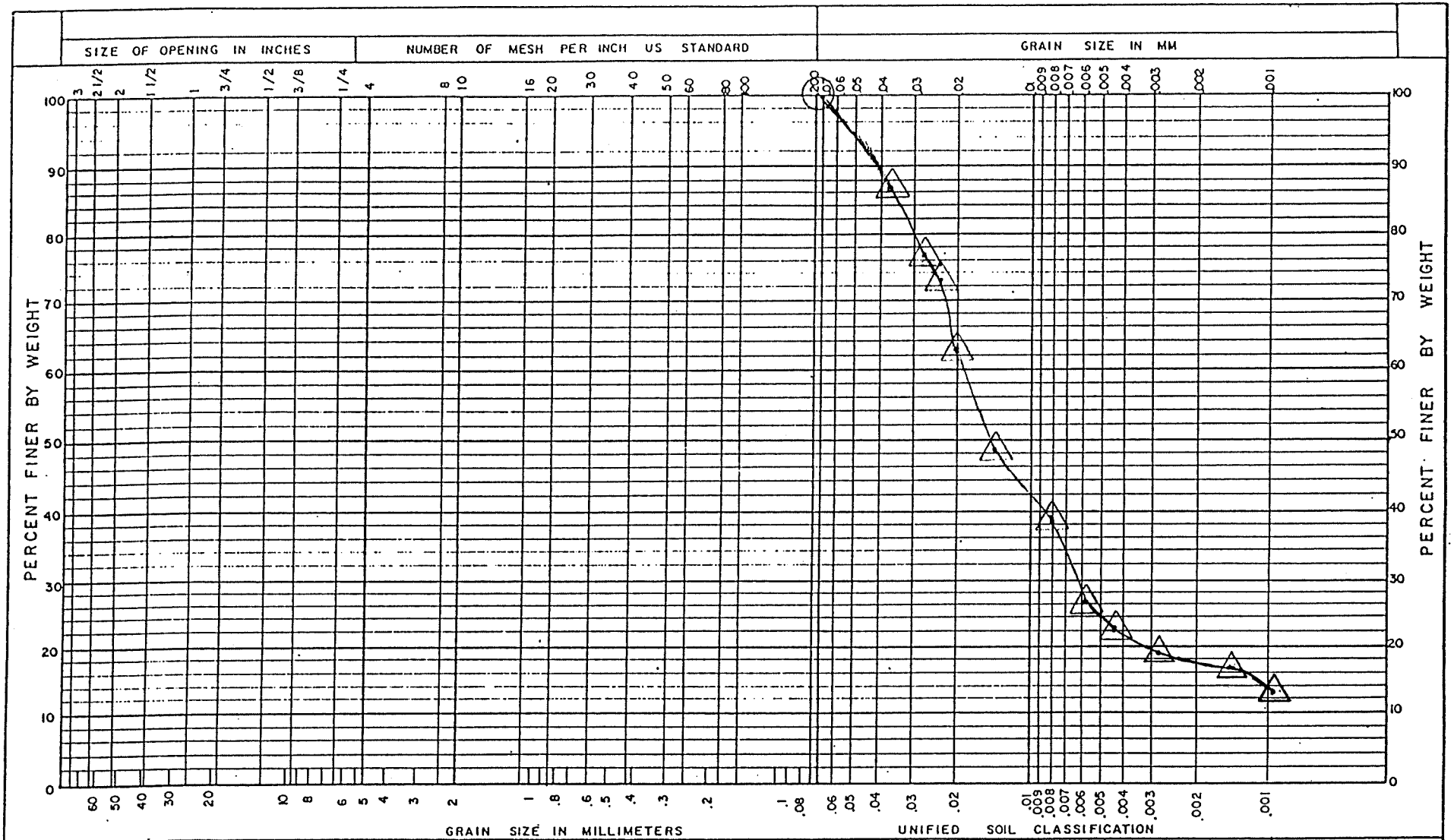
D_{60}
D_{30}
D_{10}
C_U
C_z
UNIFIED CLASS SM

⊙ MECHANICAL
△ HYDROMETER

Central Wisconsin
Engineers

GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County Proposed Landfill
DATE: May 31, 1988
JOB NO: 57786

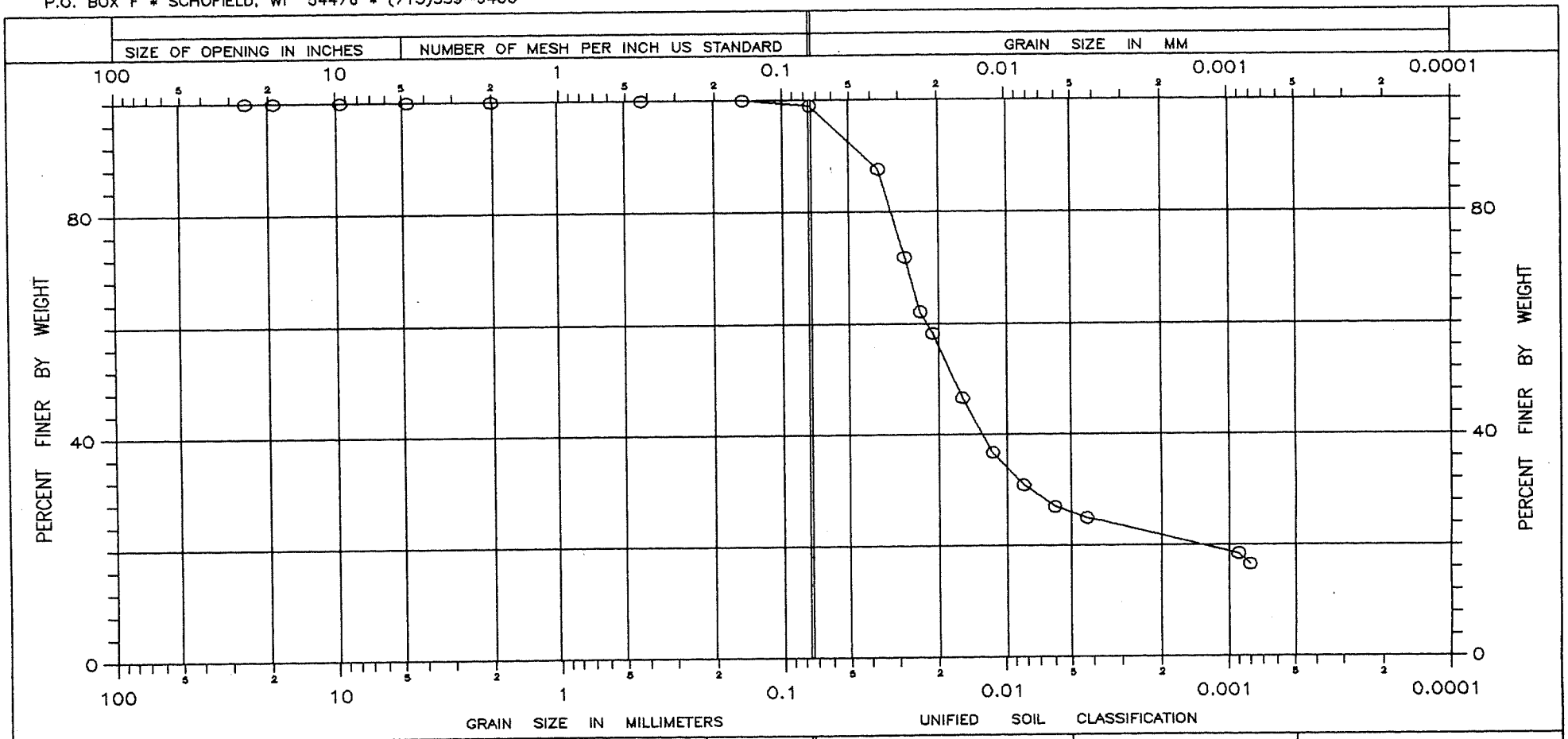


BORING NO. TB-9	GRAVEL	F. SAND	D_{60}	C_U	⊙ MECHANICAL
SAMPLE NO.	C. SAND	SILT 76%	D_{30}	C_z	△ HYDROMETER
DEPTH 15.0' - 9.0'	M. SAND	CLAY 24%	D_{10}	UNIFIED CLASS CL	
ELEV. 1234.69 - 1227.19					

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon Co.
DATE: 07/13/90
JOB NO: 70388



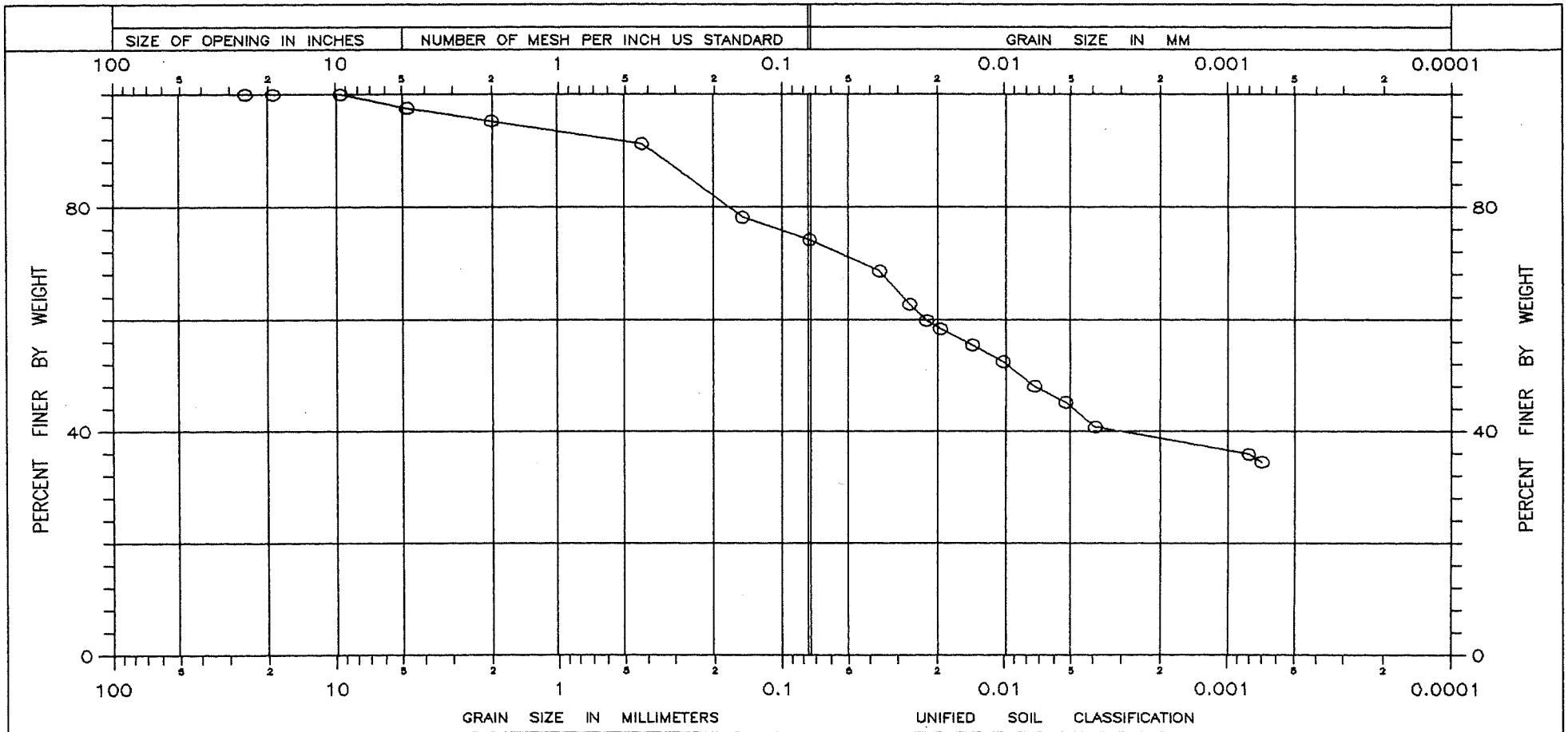
BORING NO.	MW-7	GRAVEL	0.0%	F. SAND	1.0%	D_{60}	C_u
SAMPLE NO.	S-4	C. SAND	0.0%	SILT	73.0%	D_{30}	C_z
DEPTH	4' - 5'	M. SAND	0.0%	CLAY	26.0%	D_{10}	UNIFIED CLASS CL
ELEV.							

○○○○○ MECHANICAL
○○○○○ HYDROMETER

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon Co.
DATE: 07/13/90
JOB NO: 70388



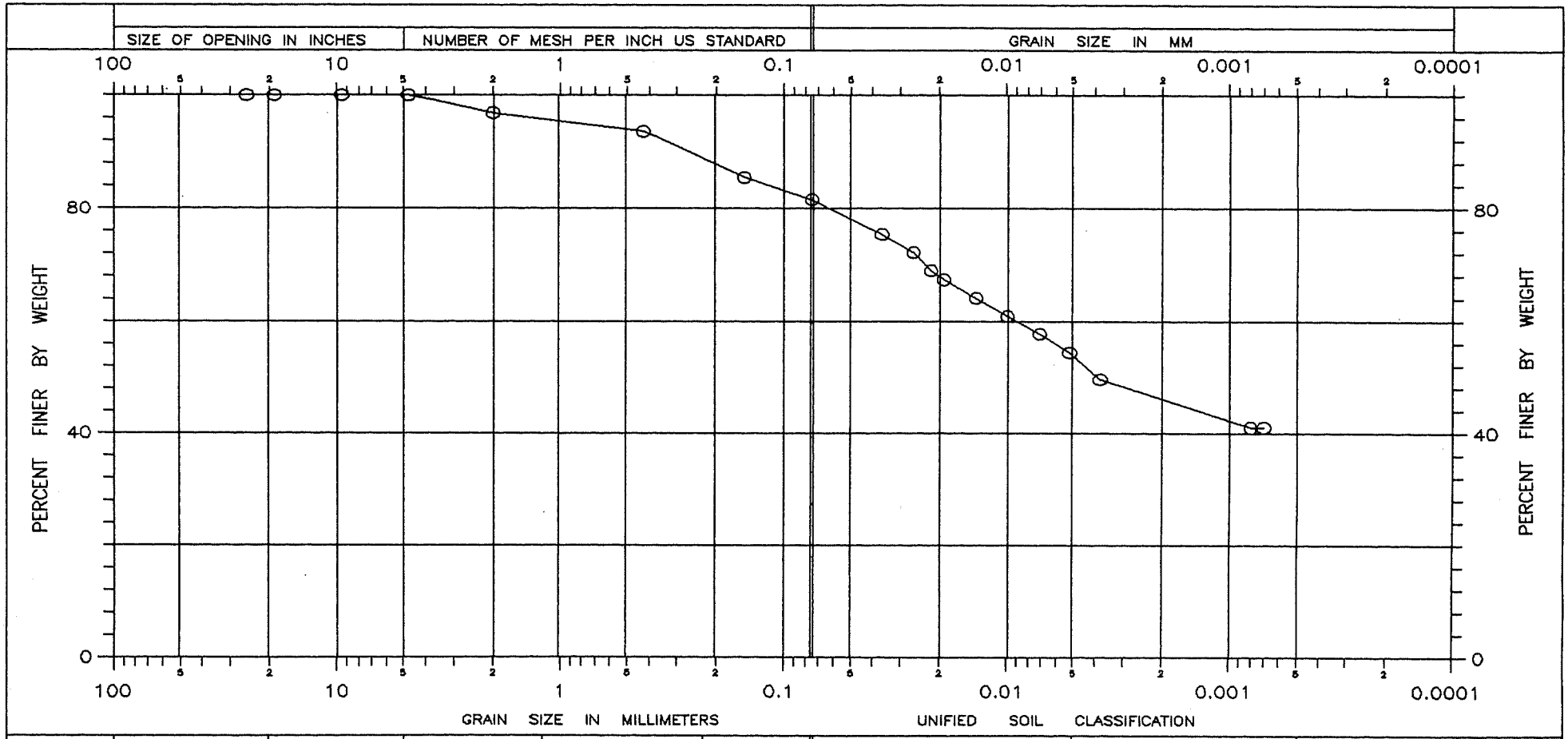
BORING NO.	MW-7	GRAVEL	2.43%	F. SAND	17.07%	D_{60}	C_u
SAMPLE NO.	S-16	C. SAND	2.28%	SILT	30.2X%	D_{30}	C_z
DEPTH	14' - 15'	M. SAND	4.02%	CLAY	44.0%	D_{10}	UNIFIED CLASS CH
ELEV.							

MECHANICAL
HYDROMETER

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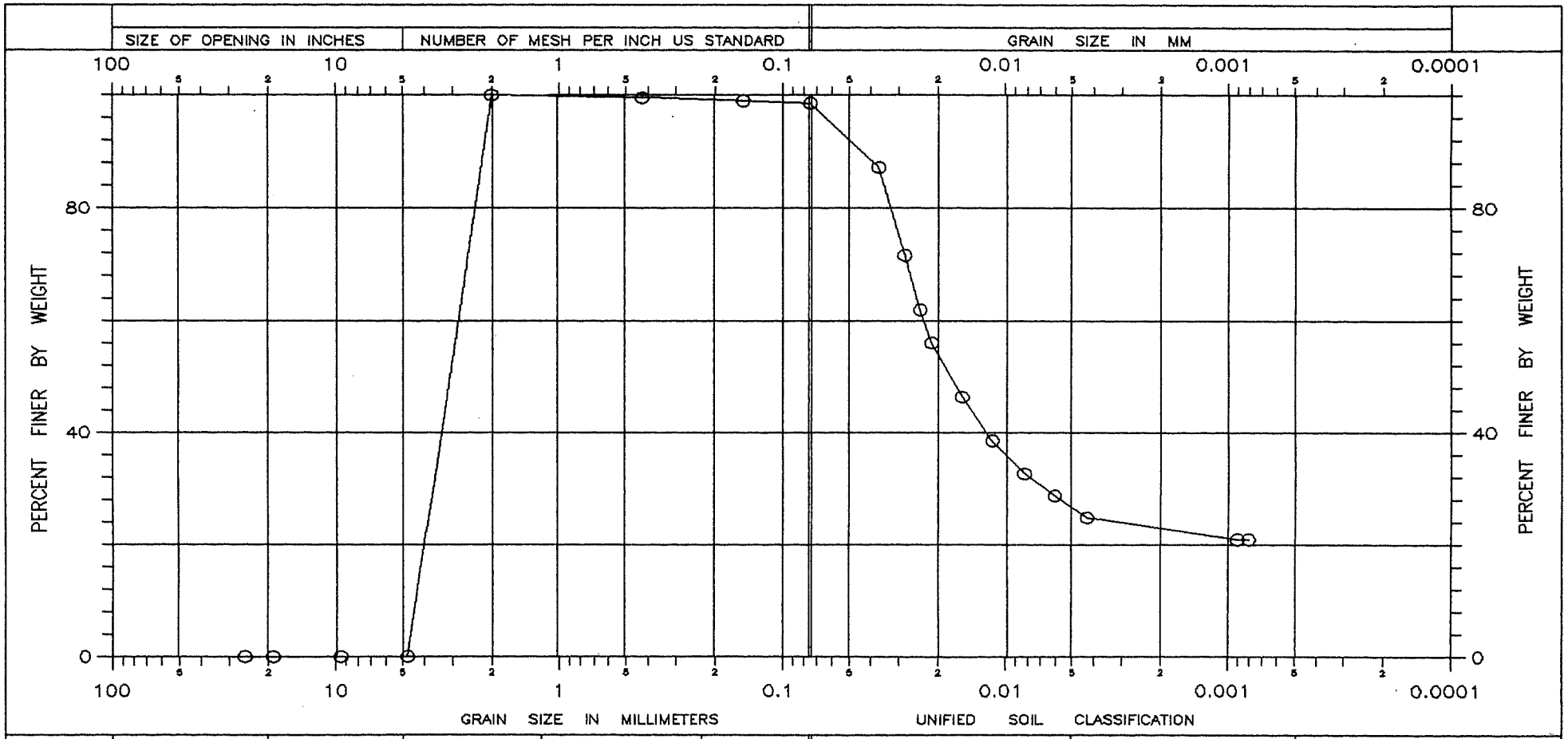
BORING NO.	TB–10	GRAVEL	0.0%	F. SAND	12.04%	D_{60}	C_u
SAMPLE NO.	S–4	C. SAND	3.16%	SILT	27.59%	D_{30}	C_z
DEPTH	14' – 16'	M. SAND	3.21%	CLAY	54.0%	D_{10}	UNIFIED CLASS CH
ELEV.							

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DATE: 07/13/90
JOB NO: 70388



COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY	COLLOIDS
GRAVEL		SAND					

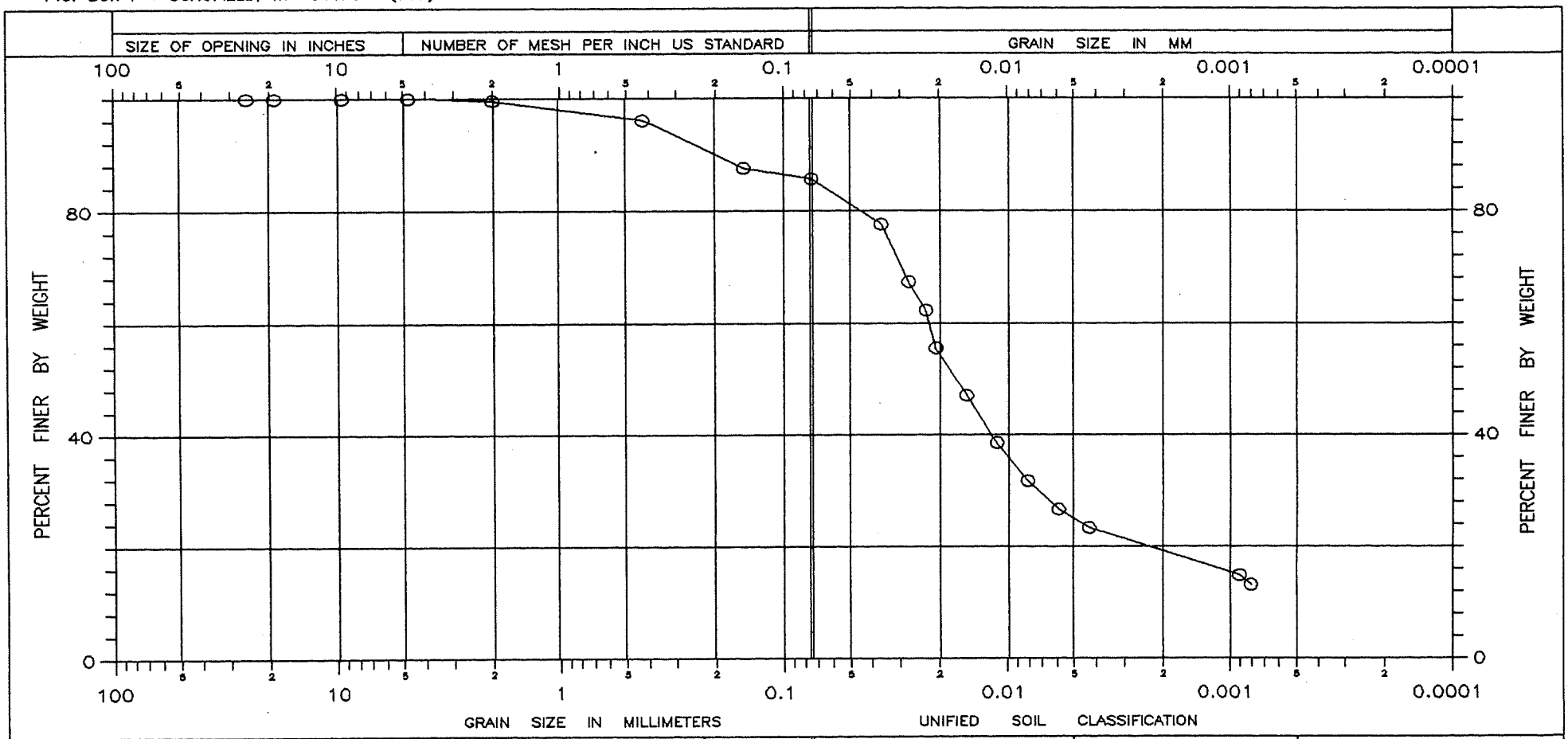
BORING NO.	TB-10	GRAVEL	0.0%	F. SAND	0.96%	D_{60}	C_u XX%
SAMPLE NO.	S-2	C. SAND	0.0%	SILT	72.58%	D_{30}	C_z XX%
DEPTH	3' - 4'	M. SAND	0.46%	CLAY	26.0%	D_{10}	UNIFIED CLASS CL
ELEV.							

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PROJECT: Vernon Co.
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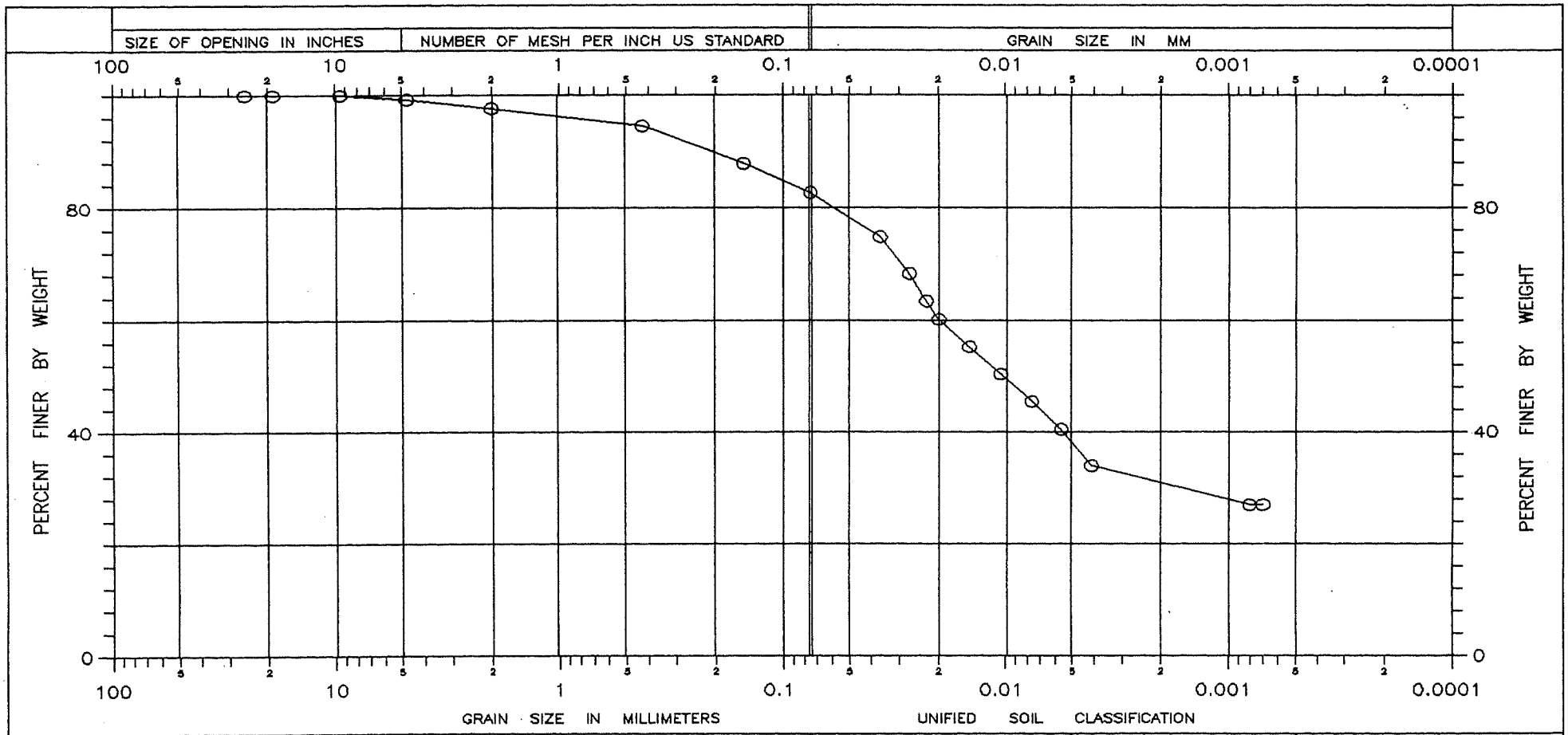


BORING NO. TB-11	GRAVEL 0.0%	F. SAND 10.42%	D_{60}	C_u	MECHANICAL
SAMPLE NO. S-2	C. SAND 0.37%	SILT 60.72%	D_{30}	C_z	HYDROMETER
DEPTH 5' - 6'	M. SAND 3.49%	CLAY 25.0%	D_{10}	UNIFIED CLASS CL	
ELEV.					

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon Co.
DATE: 07/13/90
JOB NO: 70388



BORING NO. TB-11	GRAVEL 0.75%	F. SAND 11.85%	D_{60}	C_u	MECHANICAL
SAMPLE NO. S-5	C. SAND 1.58%	SILT 44.8%	D_{30}	C_z	HYDROMETER
DEPTH 20' - 21'	M. SAND 3.12%	CLAY 37.9%	D_{10}	UNIFIED CLASS CH	
ELEV.					

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 57786

Sample No.: TB-1, 2 ft to 3 ft

Sample Description: Clay, Brown, Trace of Silt and Sand

Sample Diameter: 6.2 cm

Sample Height (L): 6.0 cm

Sample Area (A): 30.19 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density:

Moisture Content (Initial):

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	89400	89.5	83.3	2.82×10^{-7}
2	76800	83.3	79.1	2.37×10^{-7}
3	319140	79.1	61.4	2.79×10^{-7}
4	86400	61.4	58.2	2.18×10^{-7}
5	89100	58.2	55.3	2.02×10^{-7}
			Ave. K_T	2.44×10^{-7}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 57786

Sample No.: TB-3, at 2 feet

Sample Description: Clay, Red-Brown, with Sand and Some Gravel

Sample Diameter: 3.4 cm

Sample Height (L): 2.5 cm

Sample Area (A): 9.079 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density:

Moisture Content (Initial):

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	1500	89.0	88.3	2.57×10^{-6}
2	318720	88.3	87.2	1.92×10^{-8}
3	86400	87.2	86.8	2.59×10^{-8}
4	89340	86.8	86.4	2.52×10^{-8}
			Ave. K_T (Trials 2, 3, and 4)	2.34×10^{-8}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 57786

Sample No.: TB-5 (2 ft - 3 ft)

Sample Description: Clay, Red-Brown, Trace of Sand and Gravel

Sample Diameter: 3.4 cm

Sample Height (L): 6.1 cm

Sample Area (A): 9.08 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density:

Moisture Content (Initial):

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	88200	87.0	63.5	4.24×10^{-6}
2	343320	63.5	59.6	2.20×10^{-7}
3	86400	59.6	59.5	2.31×10^{-8}
4	89280	59.5	59.4	2.24×10^{-8}
			Ave. K_T	1.13×10^{-6}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 57786

Sample No.: TB-8 (at 8.0 ft)

Sample Description: Sand, Red M-F with Silt and Clay

Sample Diameter: 3.5 cm

Sample Height (L): 5.1 cm

Sample Area (A): 9.631 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density:

Moisture Content (Initial):

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	37.5	89.0	57.0	1.11×10^{-2}
2	30.97	89.0	57.0	1.35×10^{-2}
3	34.75	89.0	56.0	1.25×10^{-2}
4	32.54	89.0	54.0	1.44×10^{-2}
5	29.94	89.0	56.0	1.45×10^{-2}
6	29.04	89.0	57.0	1.44×10^{-2}
7	36.4	89.0	50.0	1.49×10^{-2}
			Ave. K_T	1.35×10^{-2}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 57786

Sample No.: TB-8 (at 15 feet)

Sample Description: Sand, Red Brown with Clay

Sample Diameter: 3.4 cm

Sample Height (L): 2.3 cm

Sample Area (A): 9.079 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density:

Moisture Content (Initial):

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	328800	89.0	69.2	3.43×10^{-7}
2	86400	69.2	65.6	2.77×10^{-7}
3	89520	65.6	62.2	2.67×10^{-7}
			Ave. K_T	2.96×10^{-7}

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FINAL TEST INFORMATION

PROJECT: Vernon County Clay Search JOB NO. 70389 DATE 10/19/89

Boring No.	Sample No.	Depth	Field Class	GRADATION - % PASSING									LL	PI	USCS	Wn %	e	Yd P.C.F.	GS	k -(CM/S)
				.005	.02	.200	100	#40	#10	#4	3/8"	3/4"								
TP-7	S1-7	1.5'-2'		28.0	58.0	99.53	100%	100%	100%	100%	100%	100%	37.7	19.4	CL					
	S2-7	3'-4.5'		26.0	50.0	88.58	89.72	96.06	98.79	99.39	100%	100%	35.0	15.22	CL					
	S3-7	6'-8'		50.0	65.0	78.53	81.07	92.06	94.02	94.49	94.72	100%	56.0	29.91	CH					
TP-8	S1-8	3'-4'		25.0	52.0	98.25	98.71	100%	100%	100%	100%	100%	39.6	16.8	CL					
	S2-8	5'-5.5'		26.0	38.0	52.8	58.57	85.3	90.65	92.73	95.58	100%	42.3	23.52	CL					
	S3-8	6'-7'		25.0	49.0	95.3	96.41	98.30	99.38	100%	100%	100%	54.8	29.37	CH					
TP-9	S2-9	3'-4'		20.0	41.0	73.53	75.95	88.48	94.65	96.9	100%	100%	37.0	17.27	CL					
	S3-9	5'-6'		40.0	56.0	72.87	76.75	88.26	93.43	94.79	96.76	100%	54.5	27.99	CL					
TP-10	S1-10	2'-3'		27.0	56.0	98.71	100%	100%	100%	100%	100%	100%	40.0	18.1	CL					
	S2-10	6'-7'		29.0	36.0	43.54	45.58	76.81	98.54	99.0	100%	100%	48.9	24.32	CL					
	S3-10	9'-10'		68.0	84.0	96.89	97.49	99.43	100%	100%	100%	100%	113.5	56.36	Pt					
TP-11	S1-11	1'-2'		27.0	54.0	94.5	95.37	97.23	98.42	99.17	100%	100%	39.5	16.55	CL					
	S2-11	3.5'-4'		42.0	53.0	73.59	77.18	92.57	96.34	97.39	98.36	100%	47.8	25.92	CL					
	S3-11	6'-7'		—	—	33.55	35.27	72.49	98.73	99.48	100%	100%	—	—						
TP-13	S1-13	2'-3'		26.0	54.0	99.45	100%	100%	100%	100%	100%	100%	42.2	17.99	CL					
	S2-13	5'-6'		39.0	58.0	78.43	81.61	95.46	98.83	99.17	100%	100%	58.8	31.62	CH					
TP-14	S2-14	4'-5'		27.0	53.0	99.47	100%	100%	100%	100%	100%	100%	36.8	15.36	CL					
	S3-14	7'-8'		23.0	52.0	98.42	100%	100%	100%	100%	100%	100%	40.5	17.51	CL					
	S4-14	9'-10'		31.0	41.0	51.63	60.38	88.76	94.87	95.99	97.58	100%	42.7	21.18	CL					
TP-15	S1-15	1'-2'		27.0	58.0	99.63	100%	100%	100%	100%	100%	100%	41.4	16.27	CL					
	S2-15	3'-4'		22.0	52.0	99.56	100%	100%	100%	100%	100%	100%	38.3	17.03	CL					
	S3-15	8'-9'		—	—	29.12	36.90	90.37	99.02	99.17	100%	100%	—	—	—					
TP-20	S1-20	2'-3'		26.0	53.0	99.77	100%	100%	100%	100%	100%	100%	36.3	15.12	CL					
	S2-20	4'-5'		27.0	56.0	99.71	100%	100%	100%	100%	100%	100%	41.5	18.19	CL					

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FINAL TEST INFORMATION

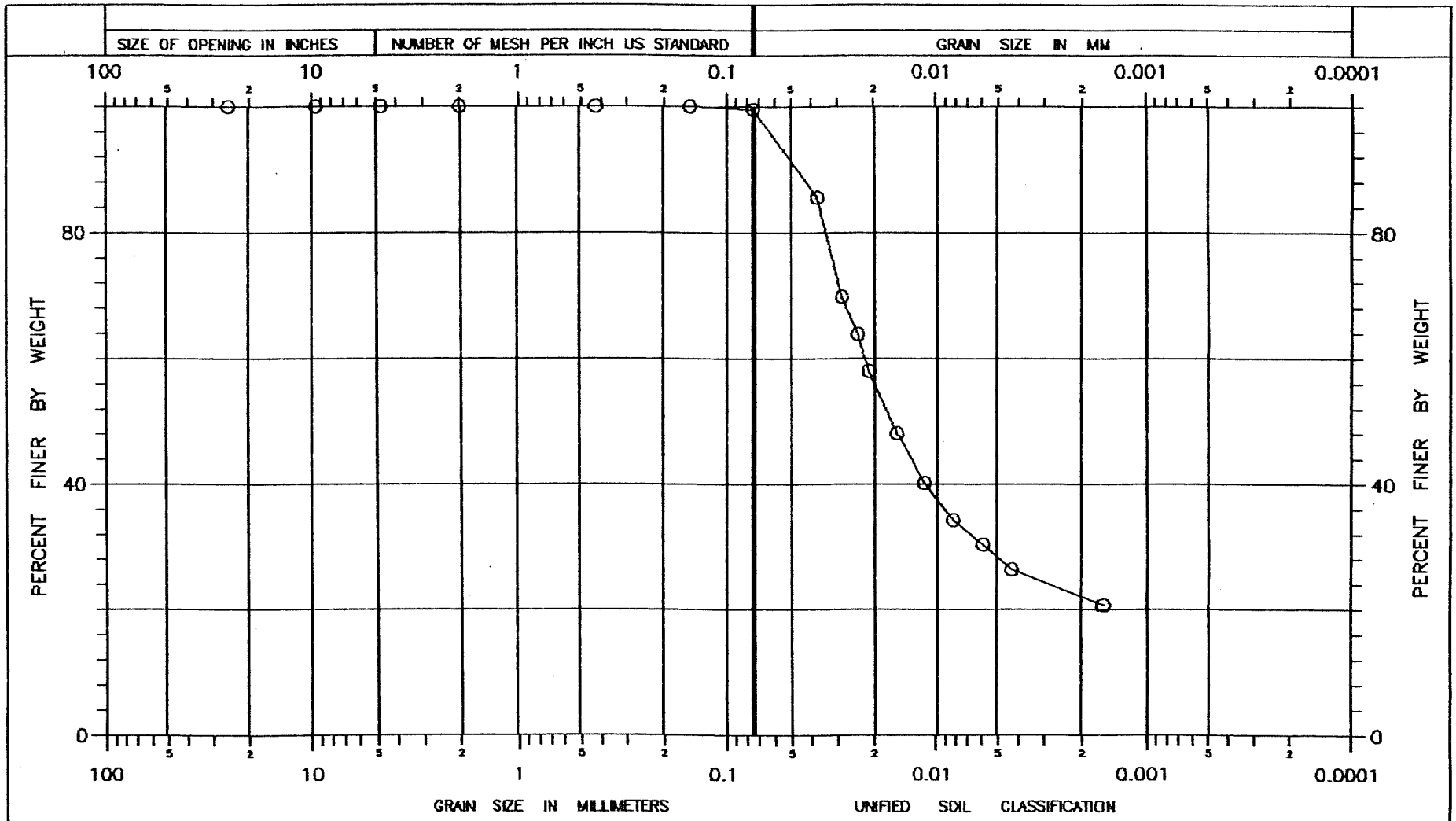
PROJECT: Vernon County Clay Search JOB NO. 70389 DATE 10/19/89

Boring No.	Sample No.	Depth	Field Class	GRADATION - % PASSING									LL	PI	USCS	Wn %	M %	D.D. P.C.F.	GS	k -(CM/S)
				.005	.02	200	100	#40	#10	#4	3/8"	3/4"								
TP-20	S3-20	8'-9'		16.0	54.0	99.70	100%	100%	100%	100%	100%	100%	36.5	15.05	CL		26.8			
	S4-20	10'-11'		39.0	51.0	61.21	66.18	93.35	99.50	99.65	100%	100%	45.0	23.33	CL					
TP-21	S1-21	2'-3'		30.0	60.0	99.73	100%	100%	100%	100%	100%	100%	41.3	19.31	CL					
	S2-21	6'-7'		28.0	56.0	99.64	100%	100%	100%	100%	100%	100%	37.4	15.39	CL					
	S3-21	10'-11'		32.0	47.0	59.81	64.32	84.52	93.74	94.81	95.94	100%	55.5	30.8	CH					
TP-22	S1-22	3'-4'		19.0	55.0	99.81	100%	100%	100%	100%	100%	100%	38.8	15.58	CL		23.3			
	S3-22	9'-10'		36.0	58.0	75.36	78.07	93.44	97.83	98.99	100%	100%	49.5	23.56	CL		25.2			
TP-25	S1-25	1.5'-2.5'		25.0	52.0	98.09	98.4	98.94	99.5	100%	100%	100%	38.3	15.45	CL					
	S2-25	4'-5'		57.0	72.0	78.85	81.25	92.66	98.97	100%	100%	100%	63.6	35.71	CH					
TP-27	S1-27	1.5'-2.5'		27.0	52.0	98.95	99.26	99.49	99.66	99.79	100%	100%	40.5	17.6	CL		21.5			
	S2-27	4'-5'		50.0	68.0	84.04	86.28	95.59	98.59	99.56	100%	100%	65.0	32.55	CH		21.1			
	S3-27	7'-9'		—	—	32.24	41.38	83.5	100%	100%	100%	100%	—	—	—		20.1			
TP-A	S1-A	4'-5'		54.0	73.0	91.49	92.16	98.1	99.29	99.58	100%	100%	62.8	32.36	CH					
	S2-A	7'-8'		50.0	63.0	78.64	80.61	93.6	98.64	100%	100%	100%	58.2	30.99	CH					
TP-B	S1-B	3'-4'		34.0	59.0	96.40	96.99	98.12	98.68	99.04	100%	100%	38.9	16.38	CL					
	S2-B	5'-6'		39.0	51.0	73.09	76.61	94.61	99.69	100%	100%	100%	45.3	22.72	CL					
	S3-B	8'-9'		69.0	73.0	84.76	87.24	96.74	99.09	99.46	100%	100%	63.5	32.48	CH		18.0			
TP-C	S1-C	3'-3.5'		26.0	54.0	99.46	100%	100%	100%	100%	100%	100%	34.9	15.09	CL					
	S2-C	5'-6'		30.0	57.0	99.0	100%	100%	100%	100%	100%	100%	43.8	20.78	CL		19.9			
	S3-C	7'-8'		42.0	51.0	60.91	64.92	88.51	93.51	94.92	97.7	100%	54.2	28.7	CL					
TP-D	S1-D	3'-4'		24.0	51.0	98.94	99.16	100%	100%	100%	100%	100%	41.1	16.23	CL					
TP-12	S2-12																22.7	104.65		9.47×10^{-9}
TP-12	S2-12																24.8	100.24		7.79×10^{-9}
TP-12	S2-12																18.64	109.74		2.66×10^{-8}
TP-12	S2-12																15.89	107.43		1.03×10^{-8}

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/27/89
JOB NO: 70389

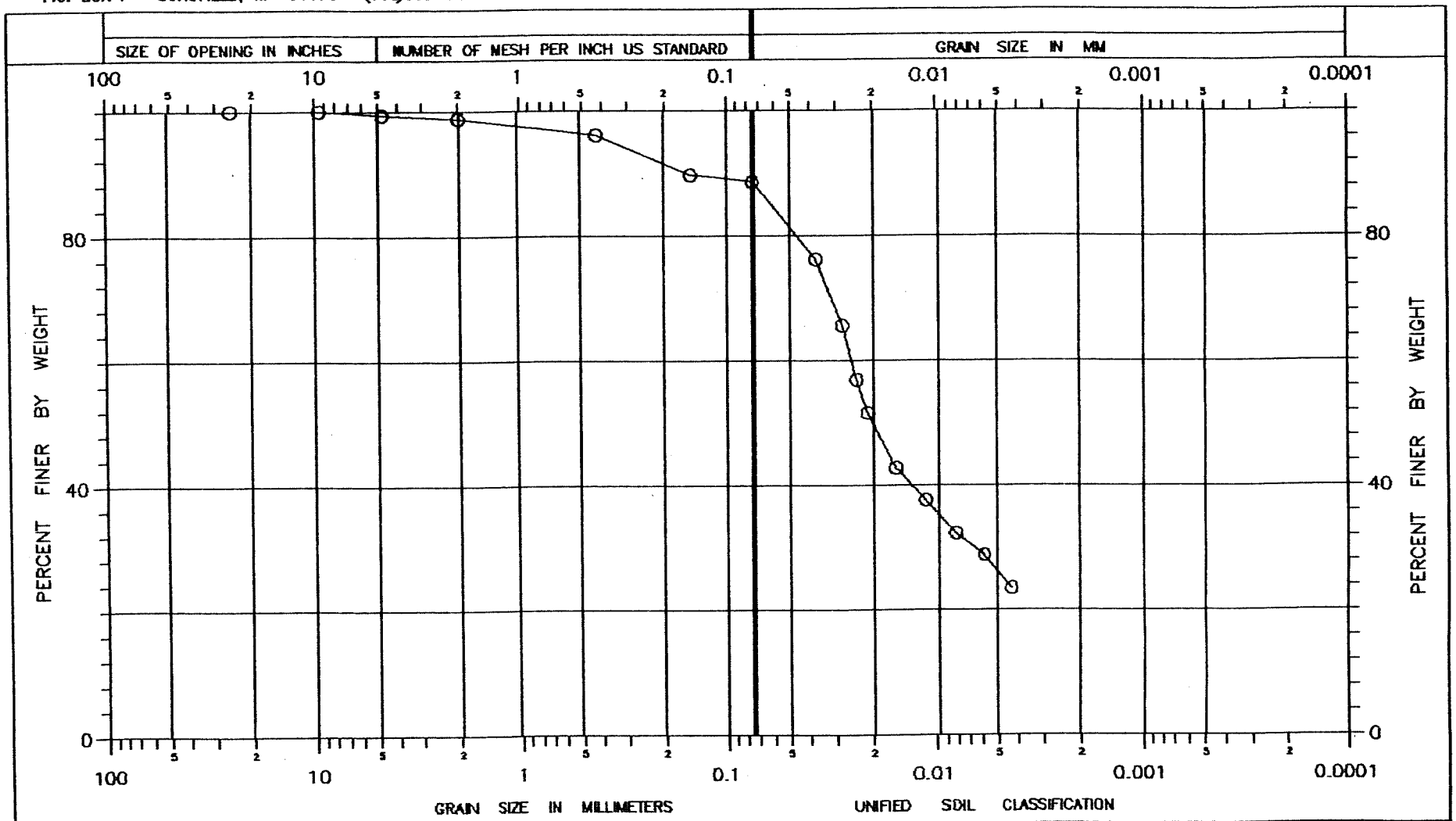


BORING NO. Test Pit 7	GRAVEL 0.0%	F. SAND 0.48%		D_{60}	C_U	○○○○○ MECHANICAL
SAMPLE NO. S1-7	C. SAND 0.0%	SILT 71.53%		D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 1.5'-2.0'	M. SAND 0.0%	CLAY 28.0%		D_{10}	UNIFIED CLASS CL	
ELEV.						

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 10/1/89
JOB NO: 70389



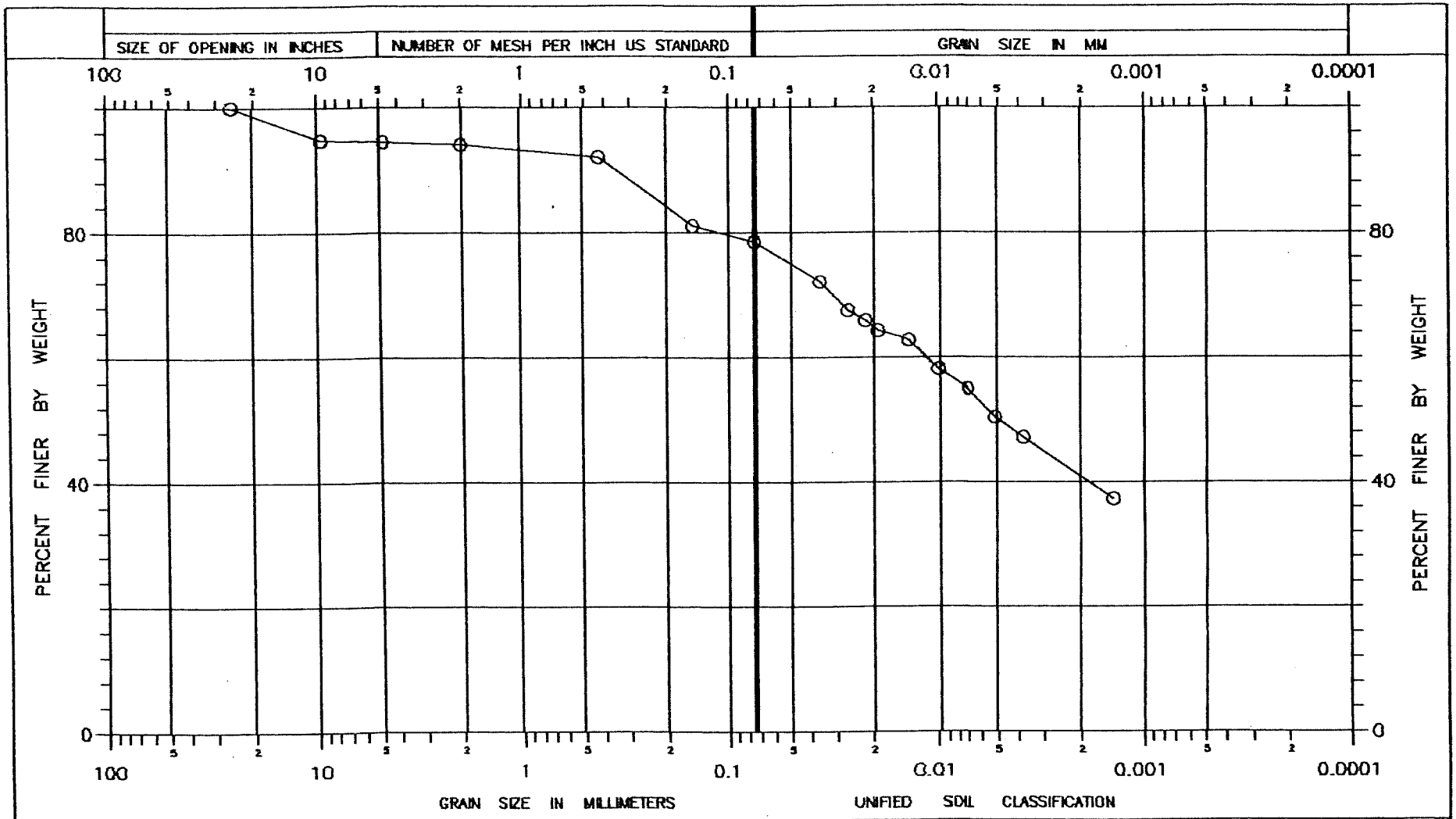
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY	COLLOIDS
	GRAVEL		SAND					

BORING NO.	Test Pit 7	GRAVEL 0.61%	F. SAND 7.48%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO.	S2-7	C. SAND 0.60%	SILT 62.58%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH	3'-4.5'	M. SAND 2.73%	CLAY 26.0%	D_{10}	UNIFIED CLASS CL	
ELEV.						

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/28/89
JOB NO: 70389

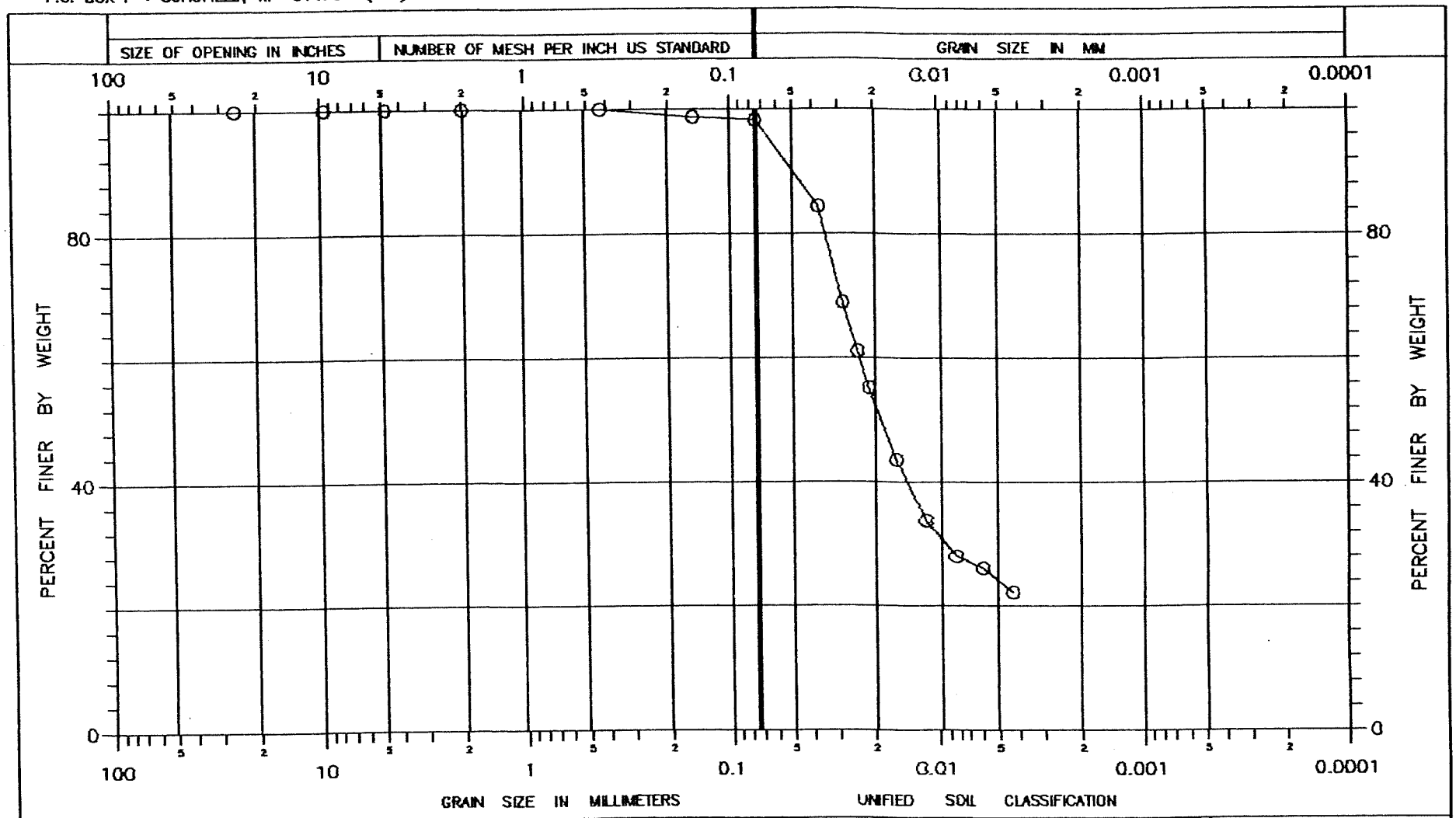


BORING NO.	Test Pit 7	GRAVEL 5.51%	F. SAND 13.53%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO.	S3-7	C. SAND 0.47%	SILT 28.53%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH	6'-8'	M. SAND 1.96%	CLAY 50.0%	D_{10}	UNIFIED CLASS CH	
ELEV.						

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/29/89
JOB NO: 70389

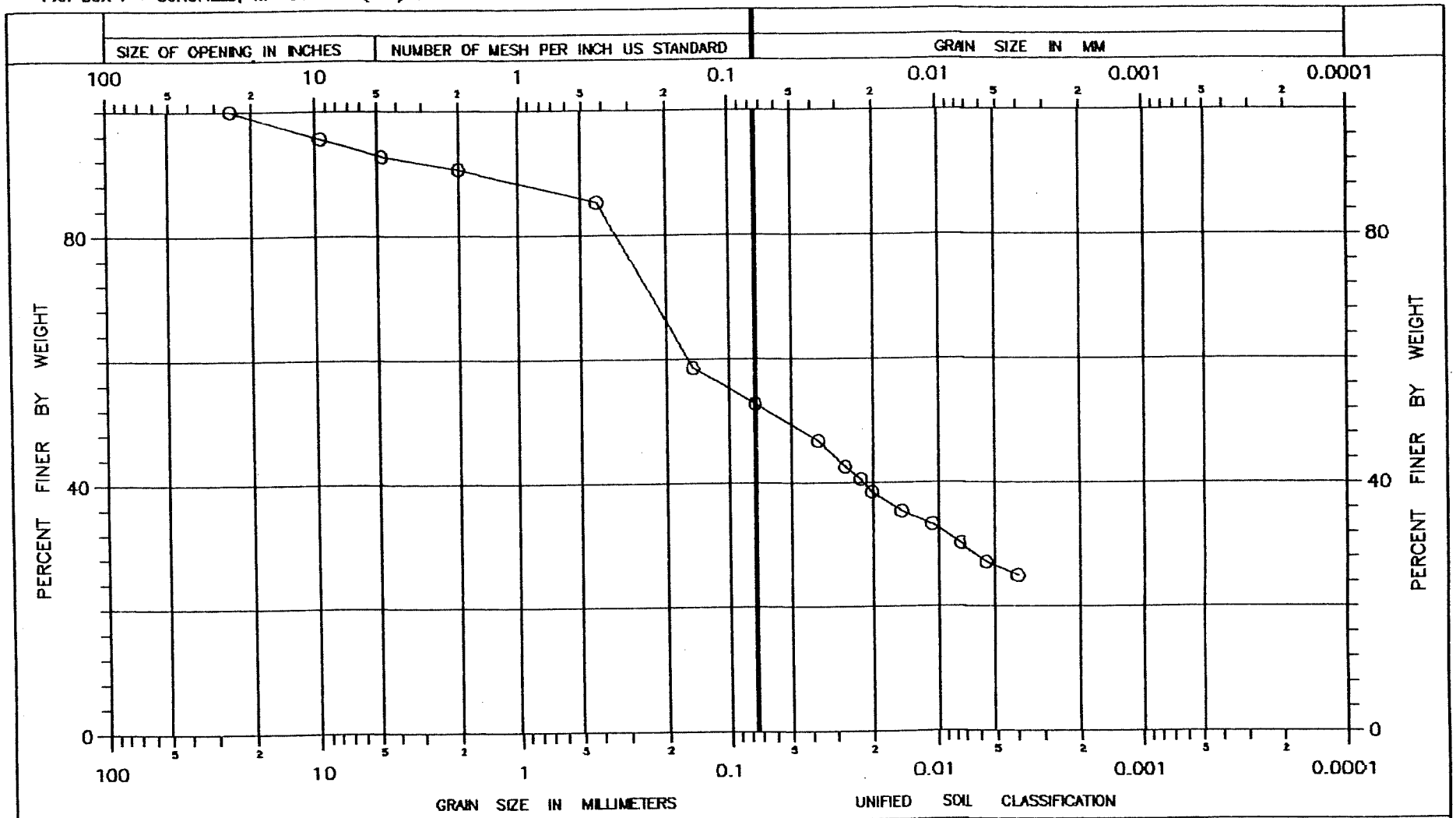


BORING NO. Test Pit 8	GRAVEL 0.0%	F. SAND 1.75%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO. S1-8	C. SAND 0.0%	SILT 73.25%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 3'-4'	M. SAND 0.0%	CLAY 25.0%	D_{10}	UNIFIED CLASS CL	
ELEV.					

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/29/89
JOB NO: 70389

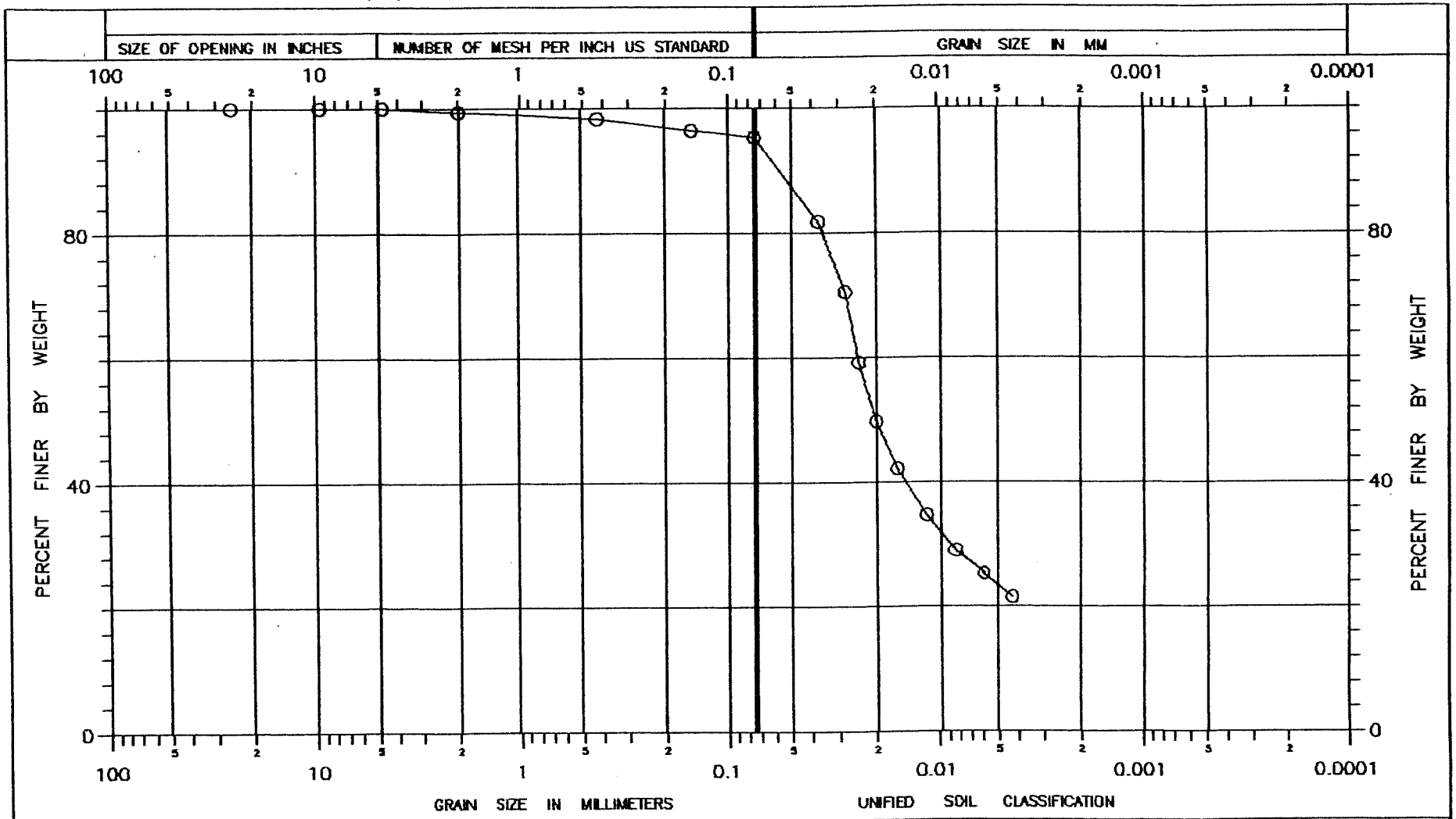


BORING NO. Test Pit 8	GRAVEL 7.27%	F. SAND 32.50%	D_{60}	C_u	○ MECHANICAL	
SAMPLE NO. S2-8	C. SAND 2.08%	SILT 26.80%	D_{30}	C_z	○ HYDROMETER	
DEPTH 5'-5.5'	M. SAND 5.35%	CLAY 26.0%	D_{10}	UNIFIED CLASS CL		
ELEV.						

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 10/1/89
JOB NO: 70389

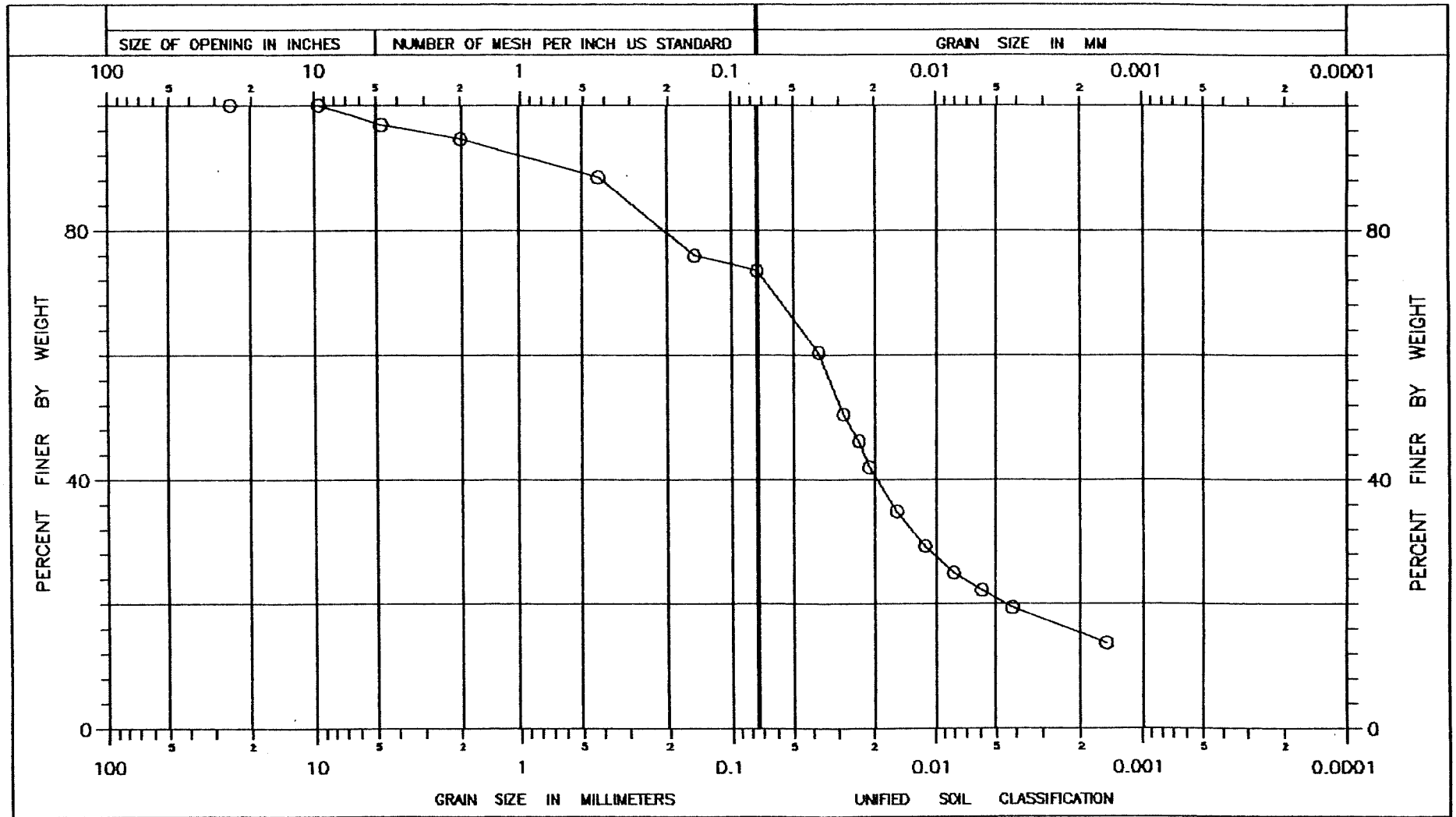


BORING NO.	Test Pit 8	GRAVEL 0.0%	F. SAND 3.0%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO.	S3-8	C. SAND 0.62%	SILT 70.3%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH	6'-7'	M. SAND 1.08%	CLAY 25.0%	D_{10}	UNIFIED CLASS CL	
ELEV.						

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 8/25/89
JOB NO: 70389

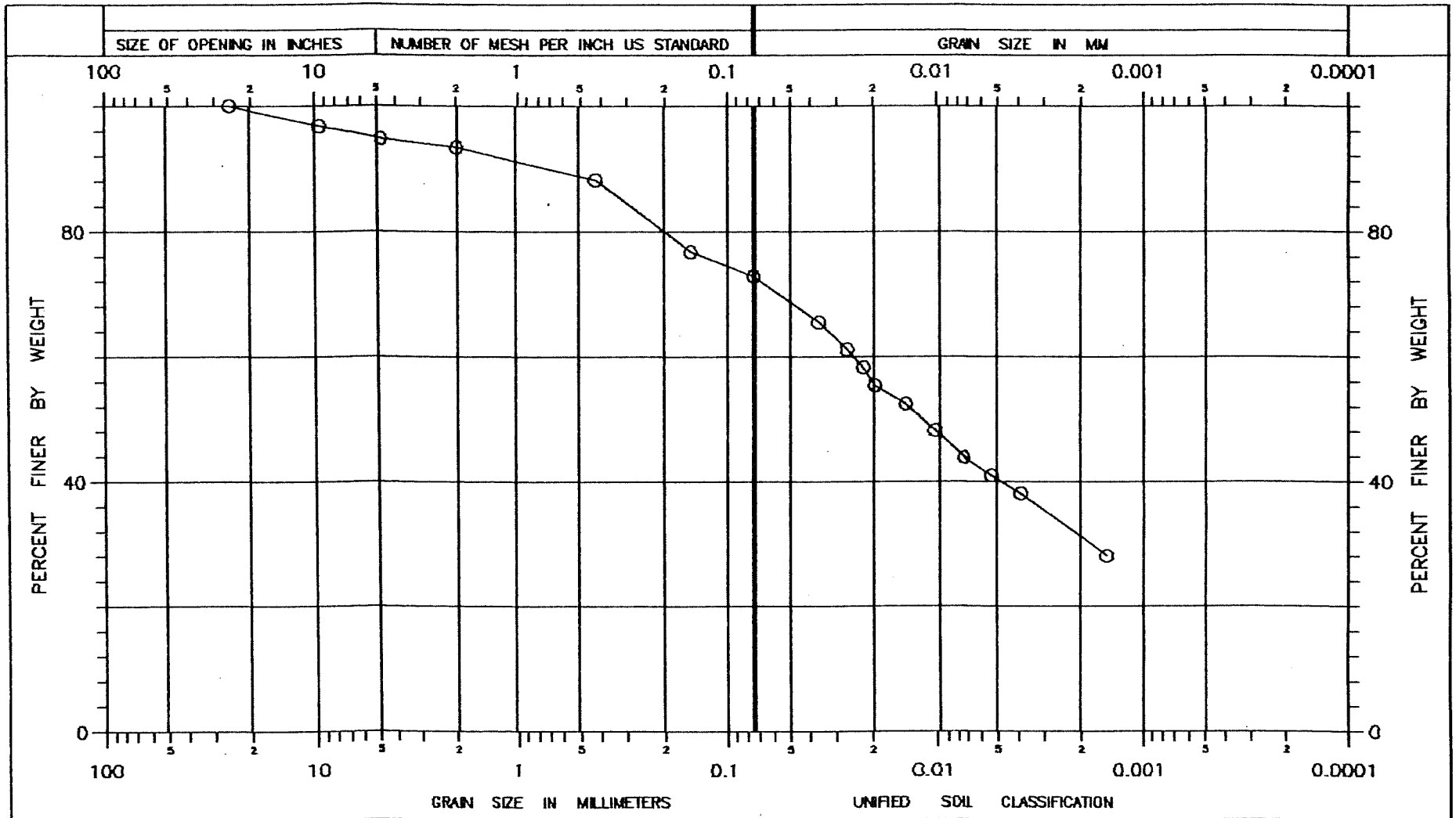


BORING NO. Test Pit 9	GRAVEL 3.1%	F. SAND 14.95%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO. S2-9	C. SAND 2.25%	SILT 53.53%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 3'-4'	M. SAND 6.17%	CLAY 20.0%	D_{10}	UNIFIED CLASS CL	
ELEV.					

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GRAIN SIZE DISTRIBUTION CURVE

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JOB NO: 70389

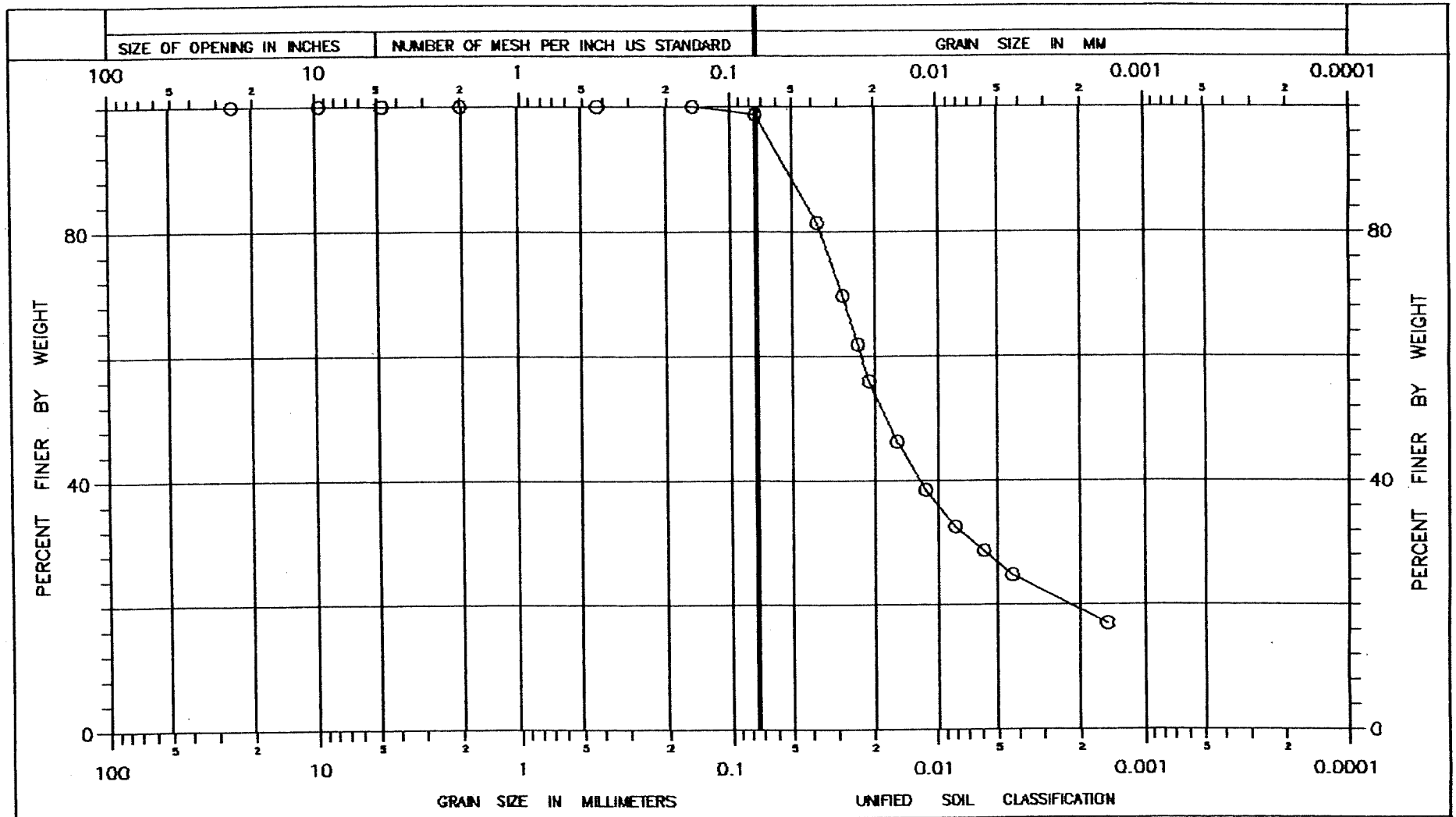


BORING NO. Test Pit	GRAVEL 5.21%	F. SAND 15.88%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO. S3-9	C. SAND 1.36%	SILT 32.87%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 5'-6'	M. SAND 5.17%	CLAY 40.0%	D_{10}	UNIFIED CLASS CL	
ELEV.					

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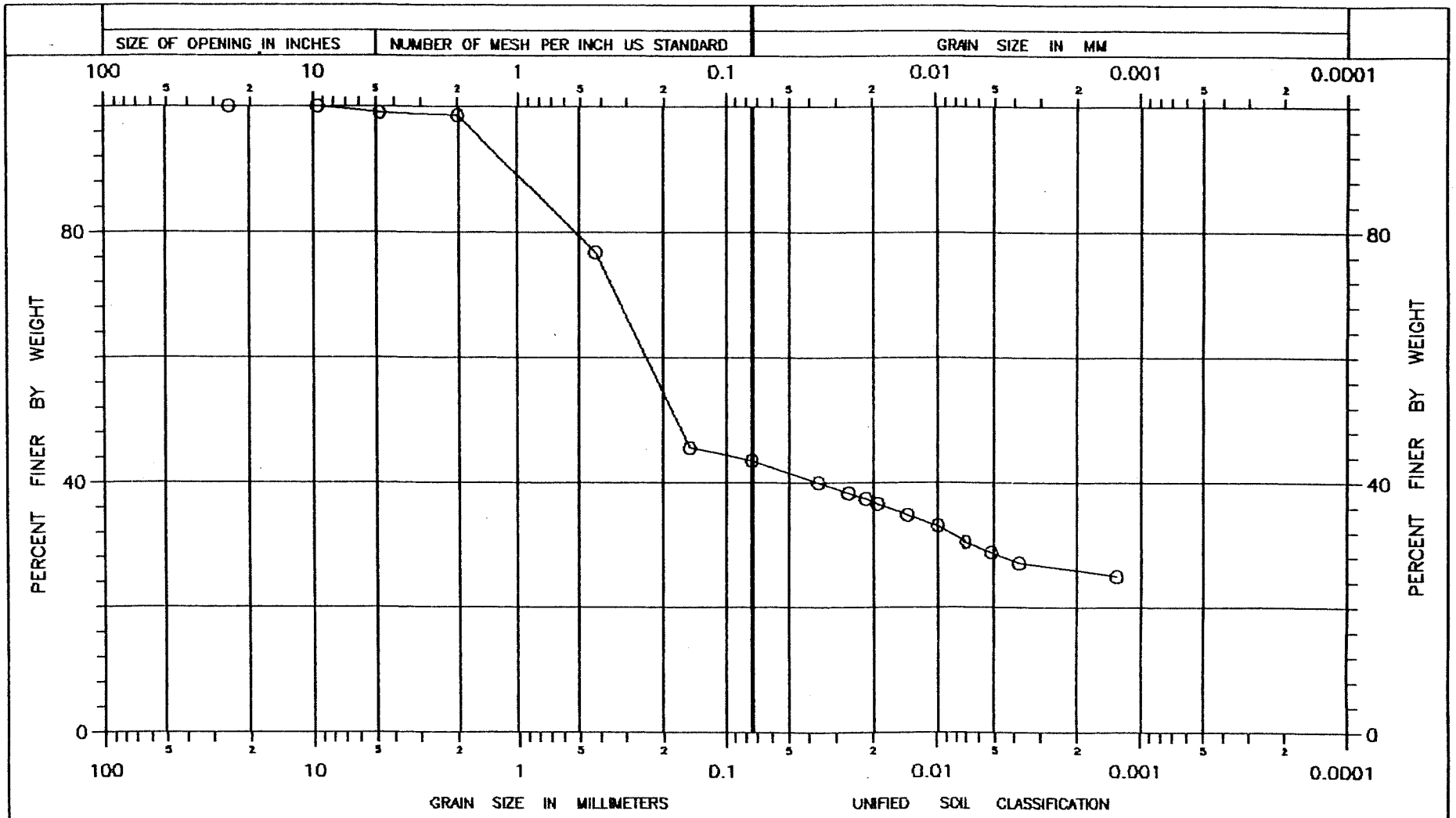


BORING NO.	Test Pit 10	GRAVEL 0.0%	F. SAND 1.29%	D_{60}	C_U	○○○○○ MECHANICAL
SAMPLE NO.	S1–10	C. SAND 0.0%	SILT 71.71%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH	2'–3'	M. SAND 0.0%	CLAY 27.0%	D_{10}	UNIFIED CLASS CL	
ELEV.						

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/28/89
JOB NO: 70389

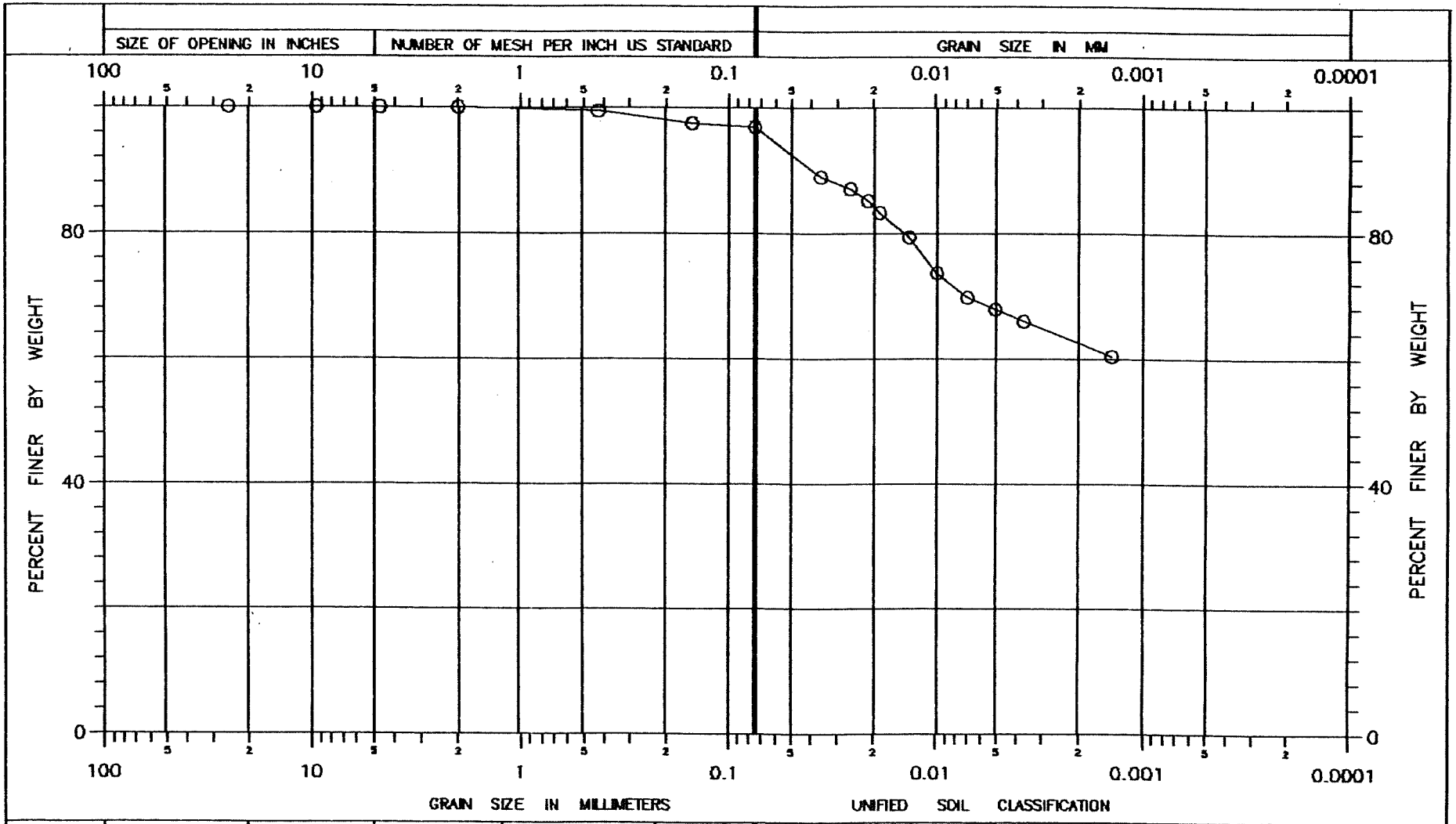


BORING NO. Test Pit 10	GRAVEL 1.0%	F. SAND 33.27%	D_{60}	C_u	MECHANICAL
SAMPLE NO. S2-10	C. SAND 0.46%	SILT 14.54%	D_{30}	C_z	HYDROMETER
DEPTH 6'-7'	M. SAND 21.73%	CLAY 29.0%	D_{10}	UNIFIED CLASS CL	
ELEV.					

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GRAIN SIZE DISTRIBUTION CURVE

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DATE: 10/16/89
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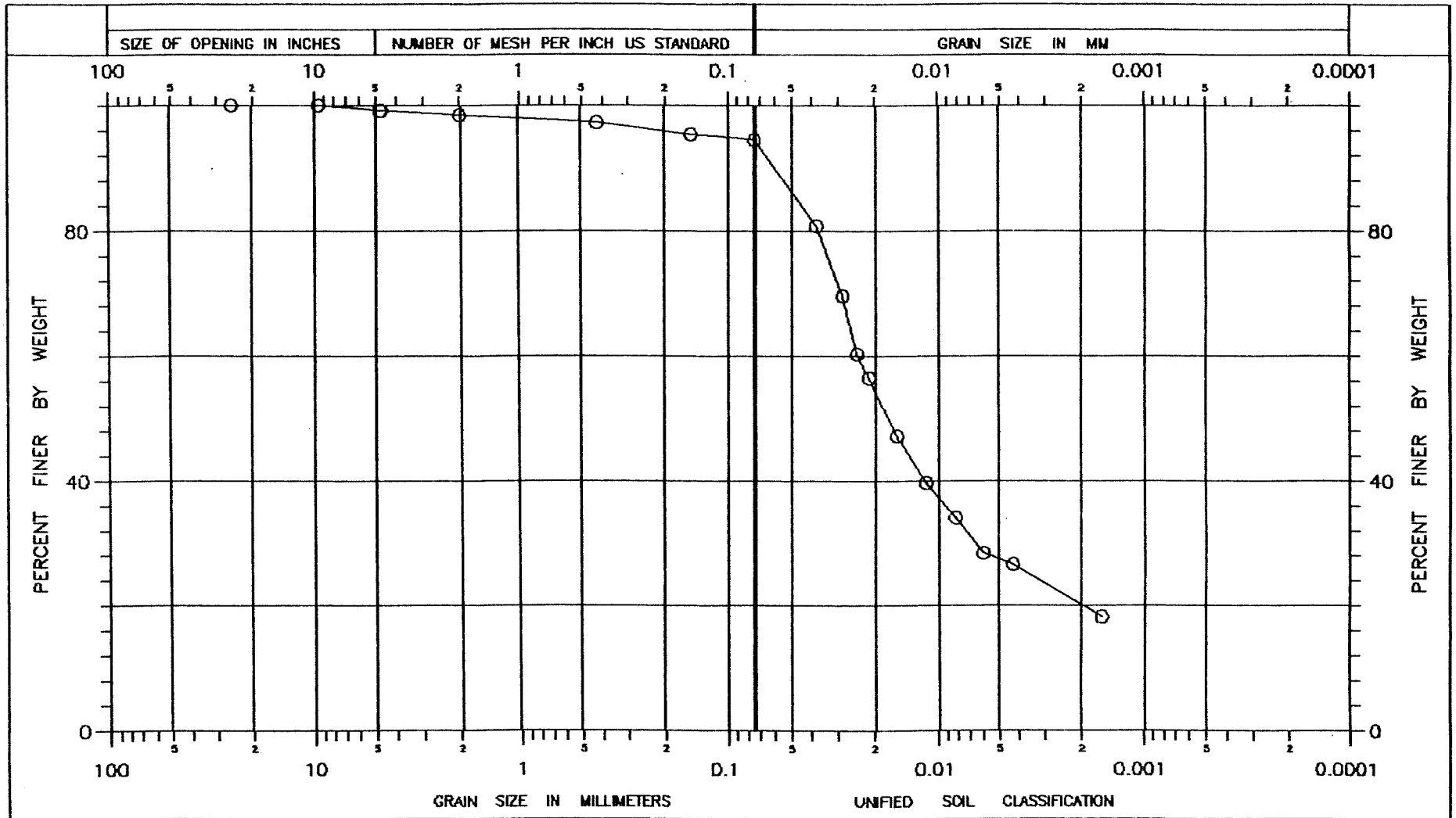
BORING NO.	Test Pit 10	GRAVEL	0.0%	F. SAND	2.54%	D_{60}	C_U
SAMPLE NO.	S3-10	C. SAND	0.0%	SILT	28.89%	D_{30}	C_z
DEPTH	9'-10'	M. SAND	0.57%	CLAY	68.0%	D_{10}	UNIFIED CLASS PT
ELEV.							

○○○○○ MECHANICAL
○○○○○ HYDROMETER

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 10/4/89
JOB NO: 70389



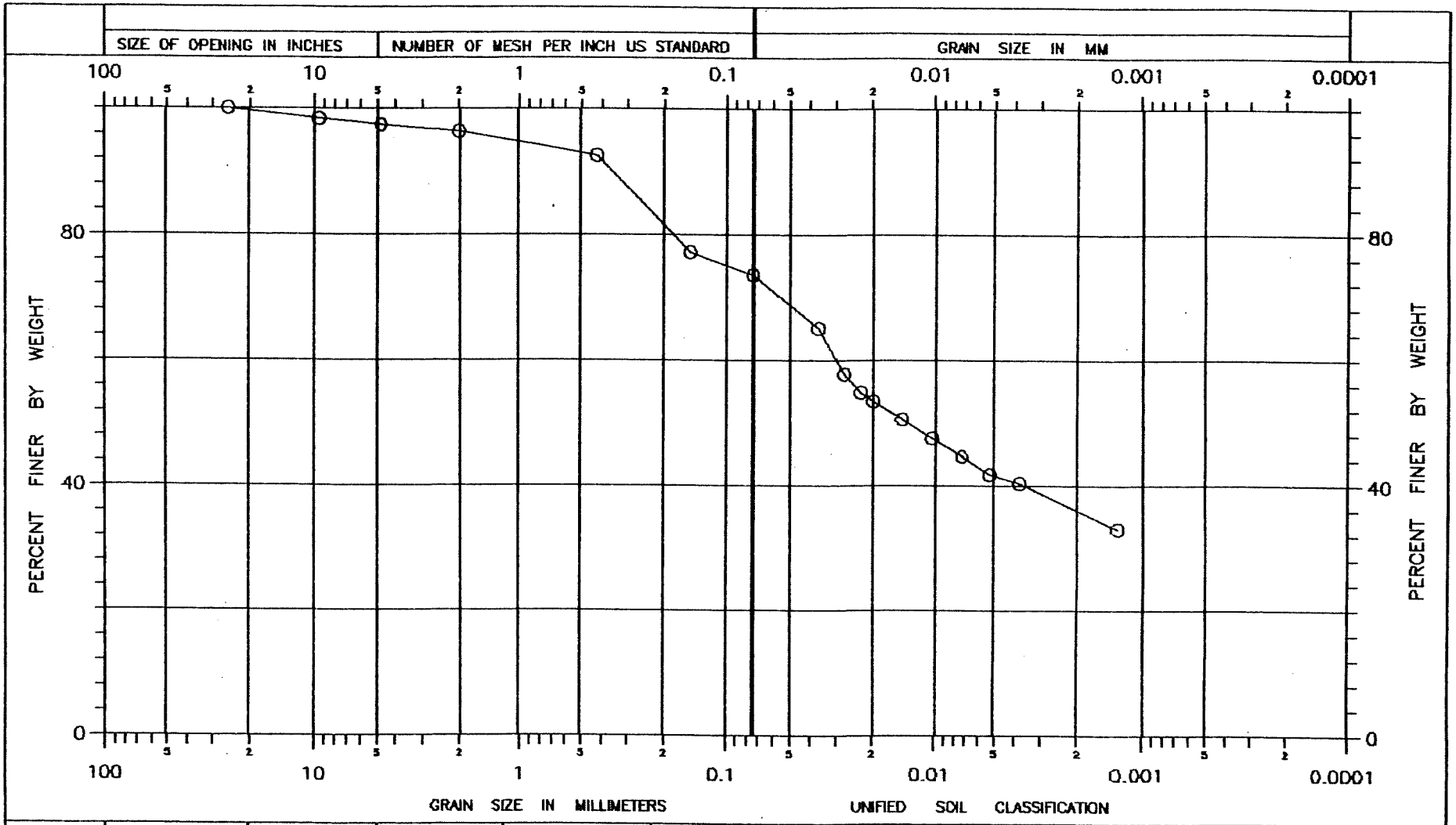
BORING NO.	Test Pit 11	GRAVEL	0.83%	F. SAND	2.73%	D_{60}	C_U
SAMPLE NO.	S1–11	C. SAND	0.75%	SILT	67.50%	D_{30}	C_z
DEPTH	1'–2'	M. SAND	1.19%	CLAY	27.0%	D_{10}	UNIFIED CLASS CL
ELEV.							

○○○○○ MECHANICAL
○○○○○ HYDROMETER

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 8/25/89
JOB NO: 70389



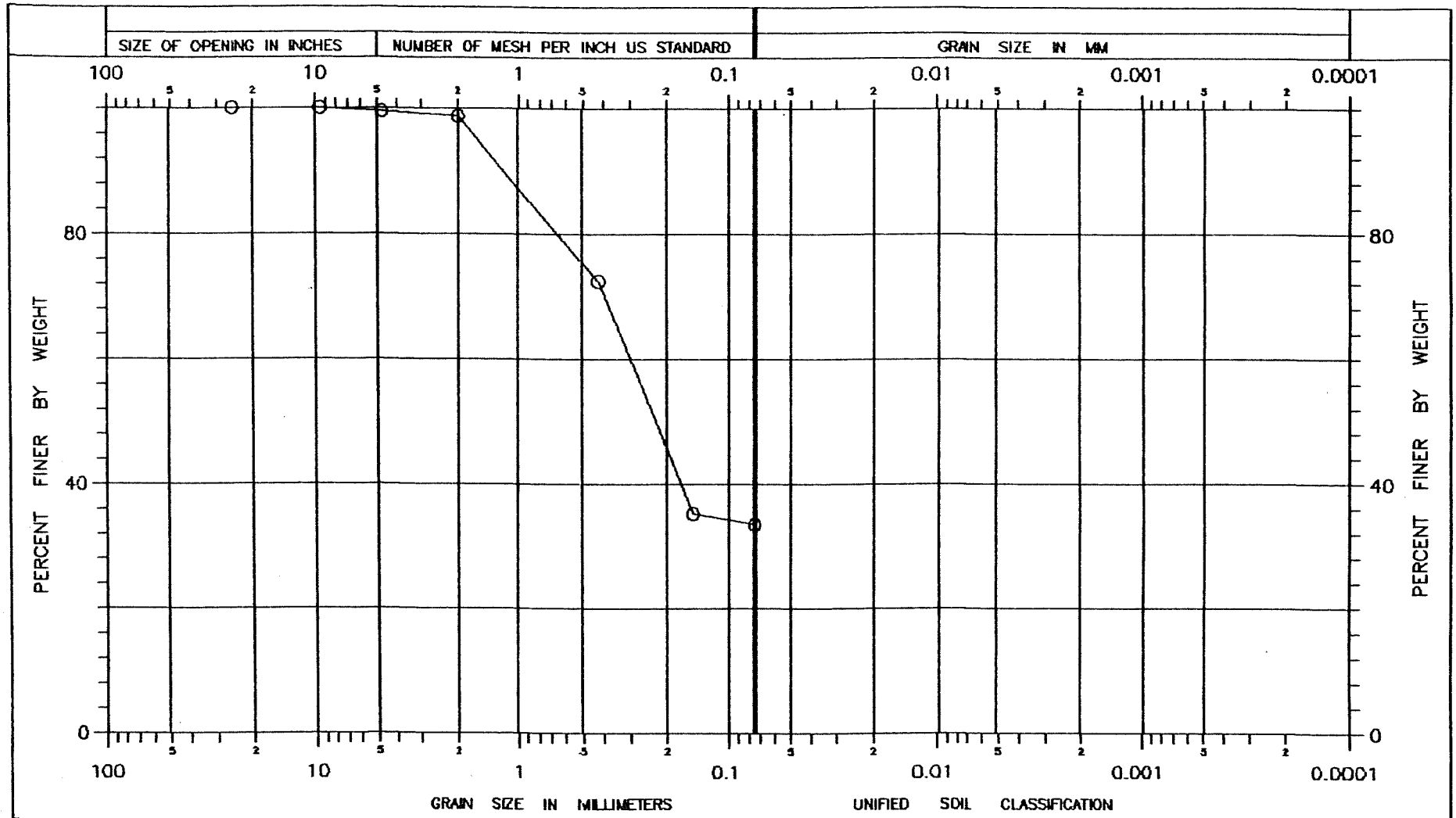
BORING NO.	Test Pit 11	GRAVEL	2.61%	F. SAND	18.98%	D_{60}	C_U
SAMPLE NO.	S2-11	C. SAND	1.05%	SILT	31.59%	D_{30}	C_z
DEPTH	3.4'-4'	M. SAND	3.77%	CLAY	42.0%	D_{10}	UNIFIED CLASS CL
ELEV.							

○ MECHANICAL
○ HYDROMETER

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 7/11/89
JOB NO: 70389



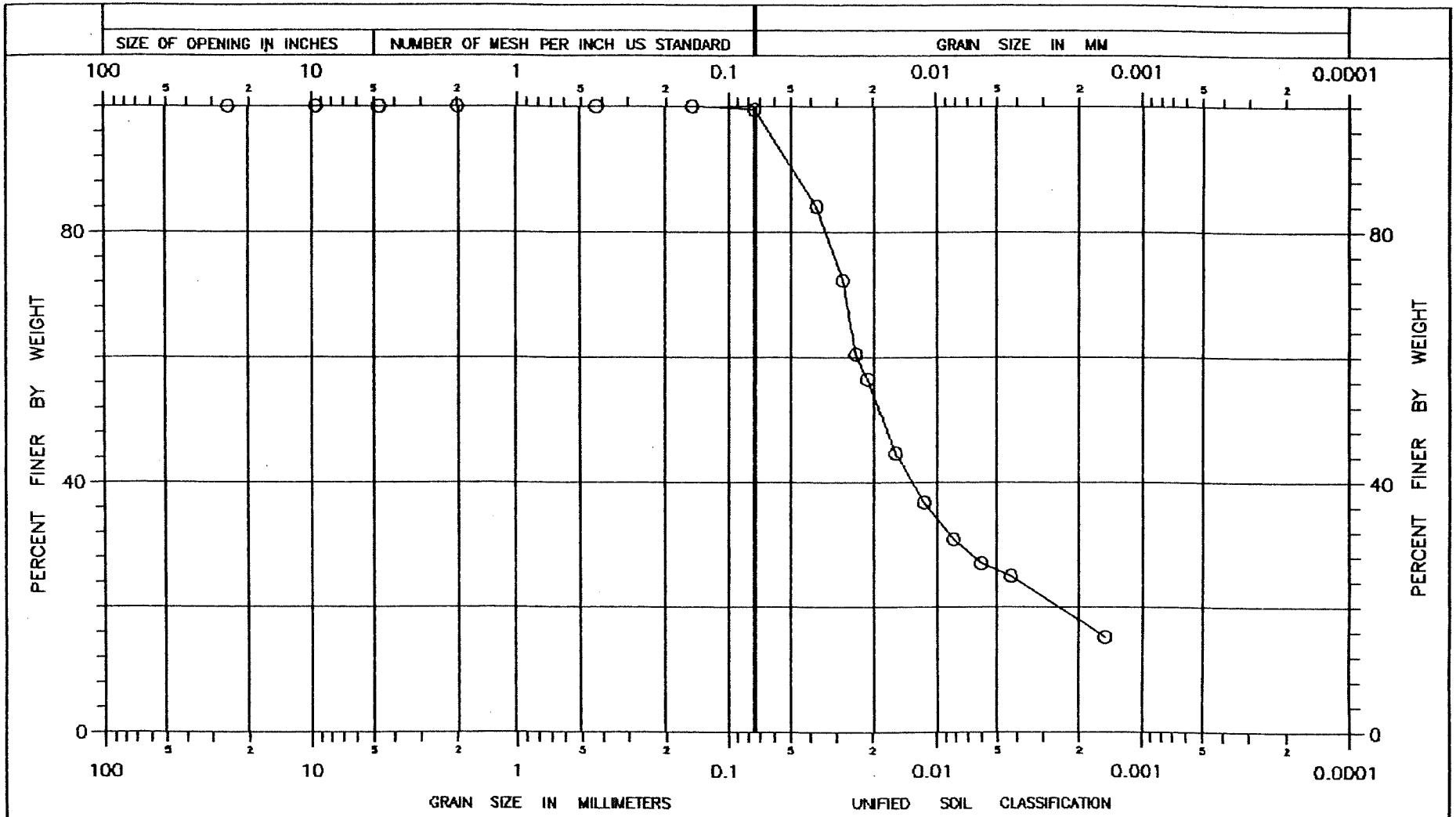
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY	COLLOIDS
	GRAVEL		SAND					

BORING NO. Test Pit 11 GRAVEL 0.52% F. SAND 38.94% D_{60} C_u ○○○○○ MECHANICAL
SAMPLE NO. S3-11 C. SAND 0.75% SILT D_{30} C_z ○○○○○ HYDROMETER
DEPTH 6'-7' M. SAND 26.24% CLAY P200= 33.55% D_{10} UNIFIED CLASS SC
ELEV.

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 8/25/89
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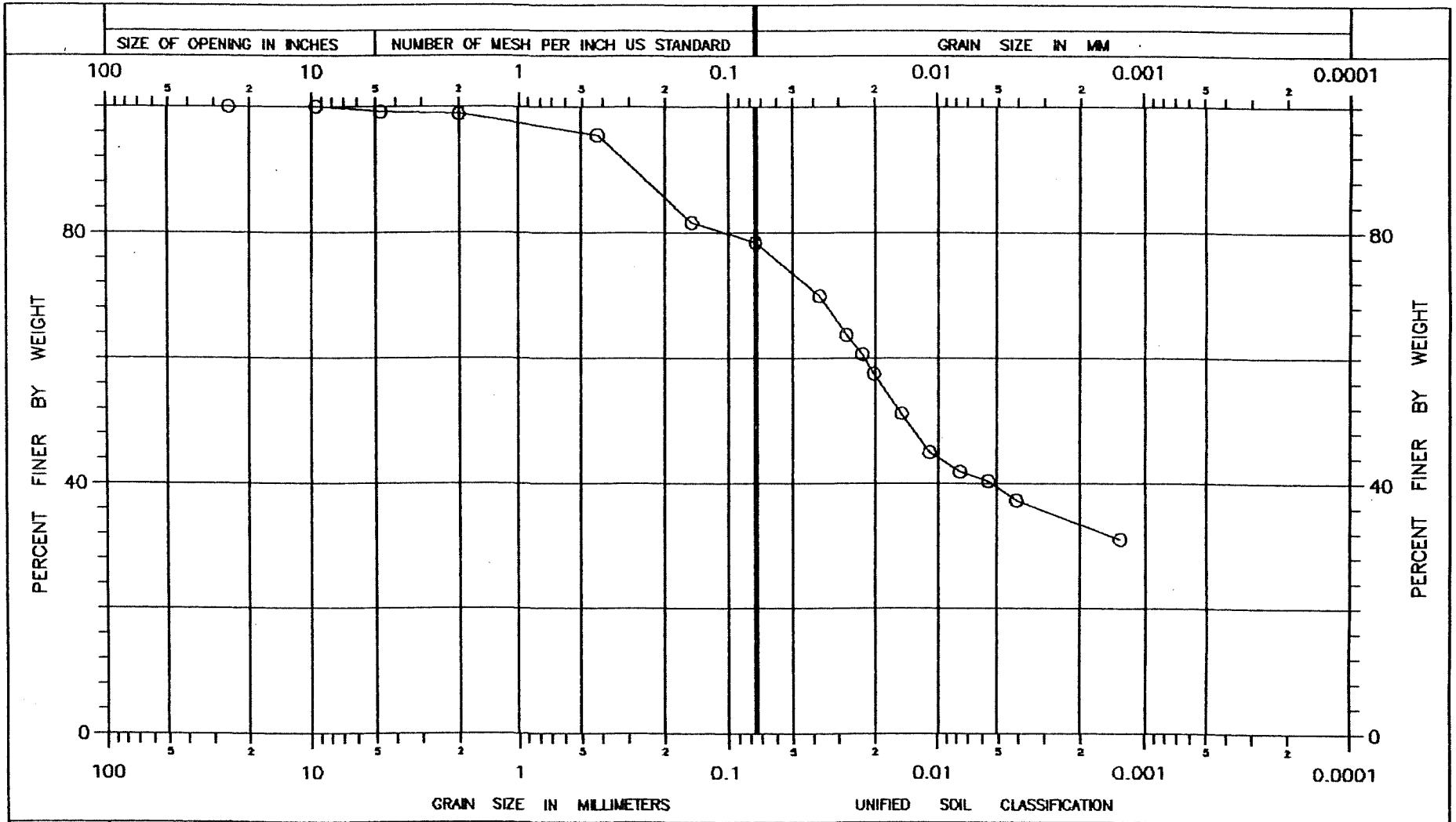


BORING NO.	Test Pit 13	GRAVEL 0.0%	F. SAND 0.55%		D_{60}	C_U	○○○○○ MECHANICAL
SAMPLE NO.	S1-13	C. SAND 0.0%	SILT 73.45%		D_{30}	C_z	○○○○○ HYDROMETER
DEPTH	2'-3'	M. SAND 0.0%	CLAY 26.0%		D_{10}	UNIFIED CLASS CL	
ELEV.							

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DATE: 8/25/89
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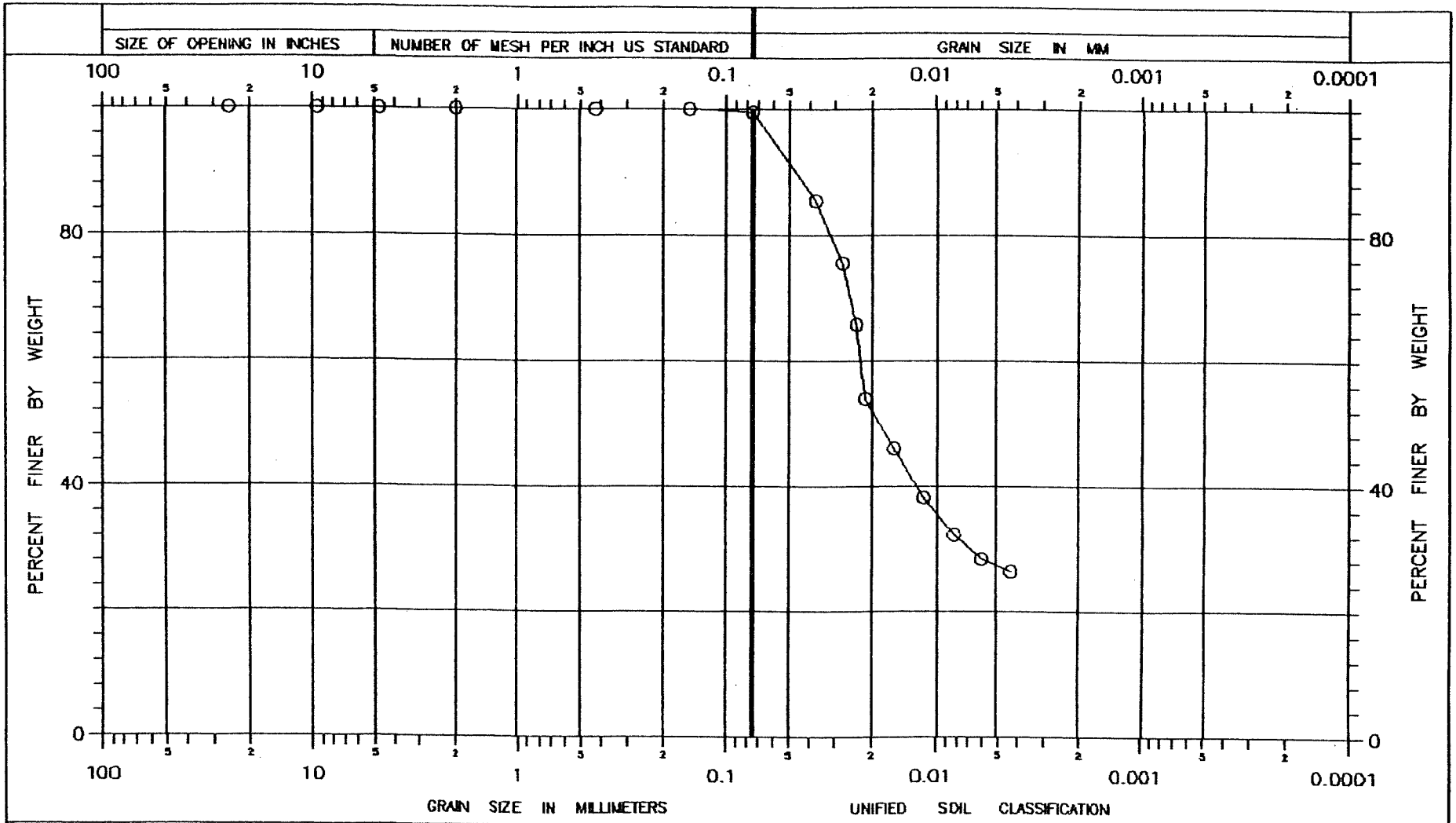


BORING NO. Test Pit 13	GRAVEL 0.83%	F. SAND 17.03%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO. S2-13	C. SAND 0.34%	SILT 39.43%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 5'-6'	M. SAND 3.37%	CLAY 39.0%	D_{10}	UNIFIED CLASS CH	
ELEV.					

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DATE: 10/1/89
JOB NO: 70389

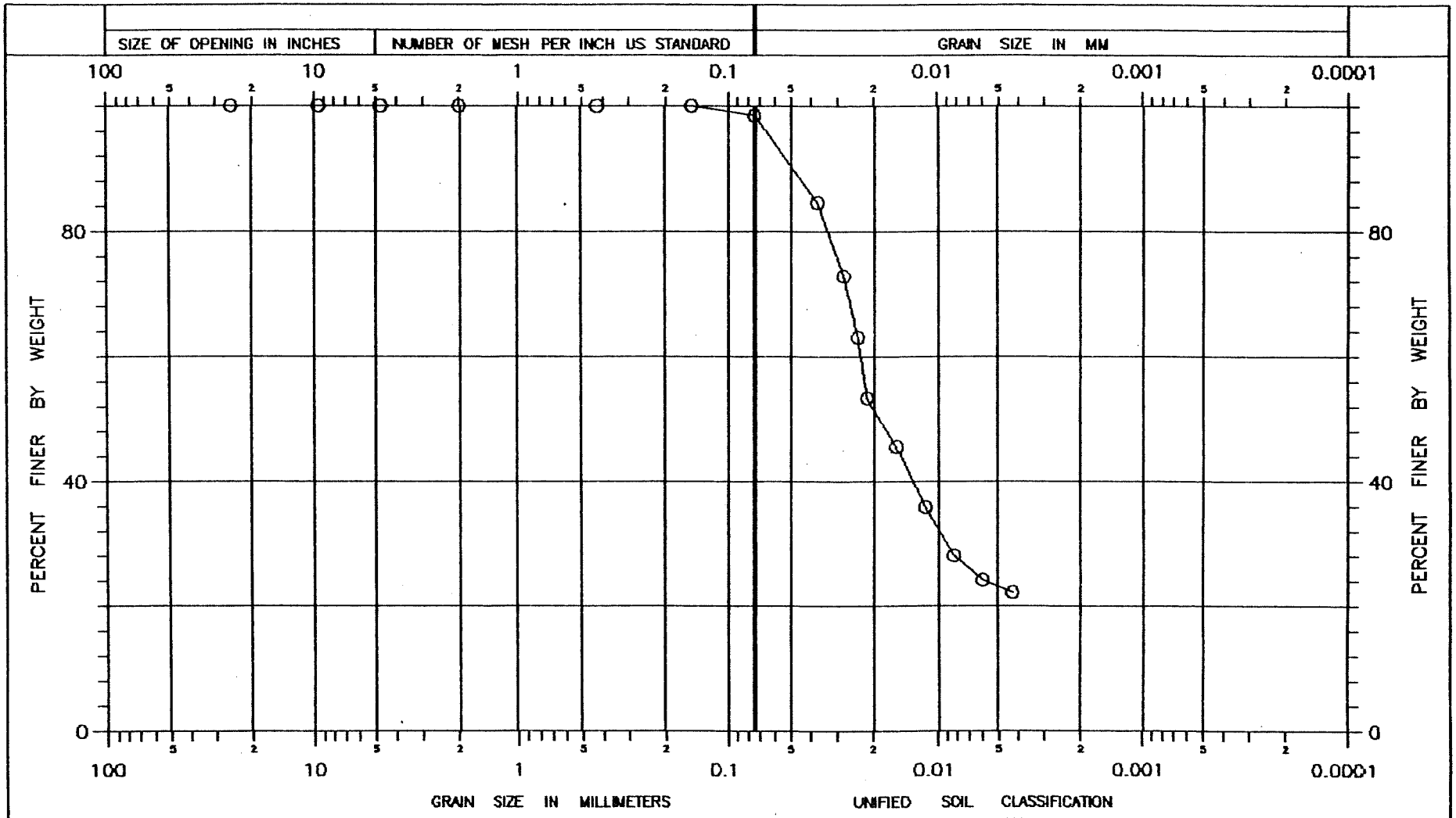


BORING NO.	Test Pit 14	GRAVEL 0.0%	F. SAND 0.5%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO.	S2-14	C. SAND 0.0%	SILT 72.4%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH	4'-5'	M. SAND 0.0%	CLAY 27.%	D_{10}	UNIFIED CLASS CL	
ELEV.						

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JOB NO: 70389

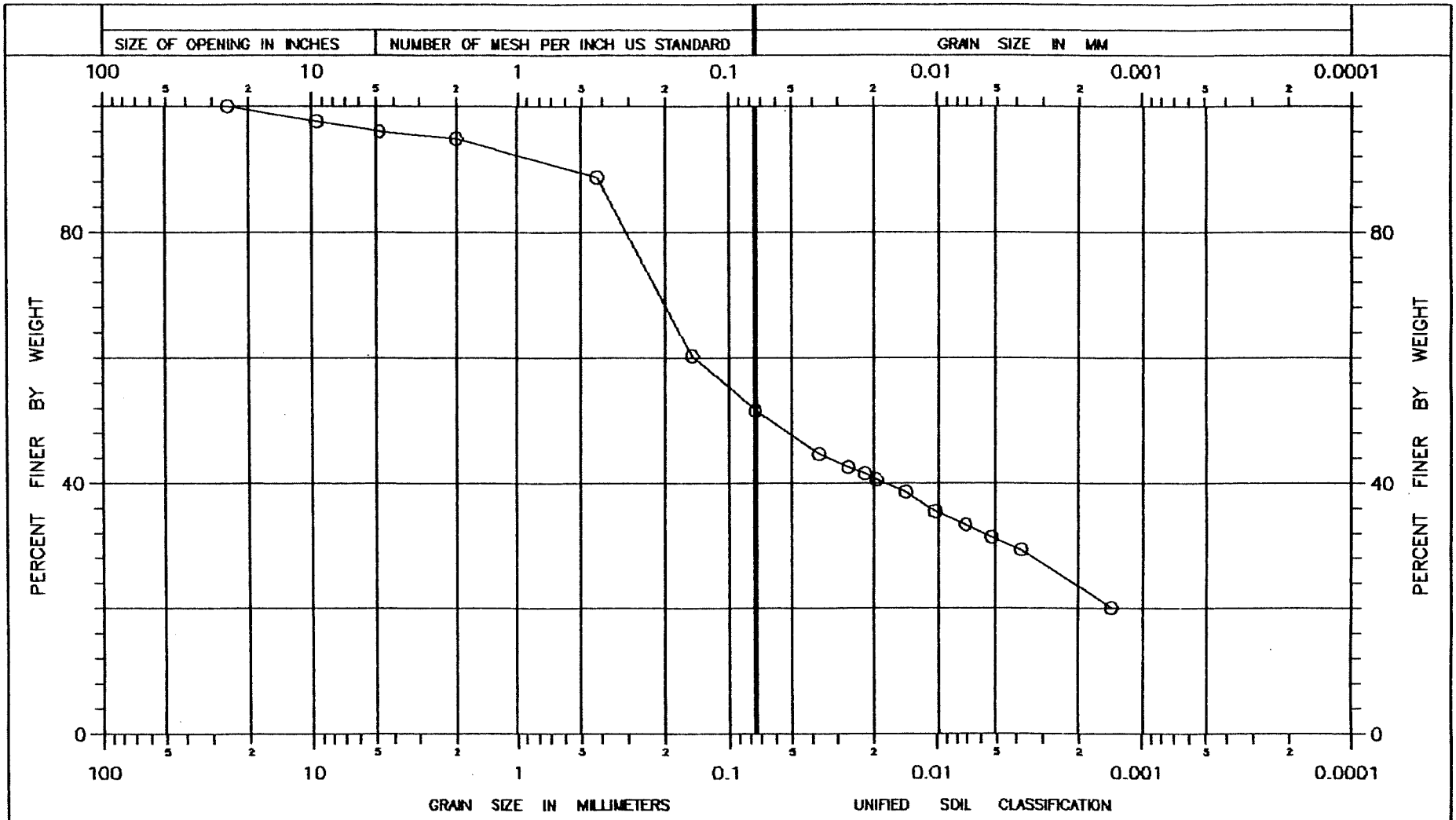


BORING NO. Test Pit 14	GRAVEL 0.0%	F. SAND 1.58%		D_{60}	C_U	○○○○○ MECHANICAL
SAMPLE NO. S3-14	C. SAND 0.0%	SILT 75.42%		D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 7'-8'	M. SAND 0.0%	CLAY 23.0%		D_{10}	UNIFIED CLASS CL	
ELEV.						

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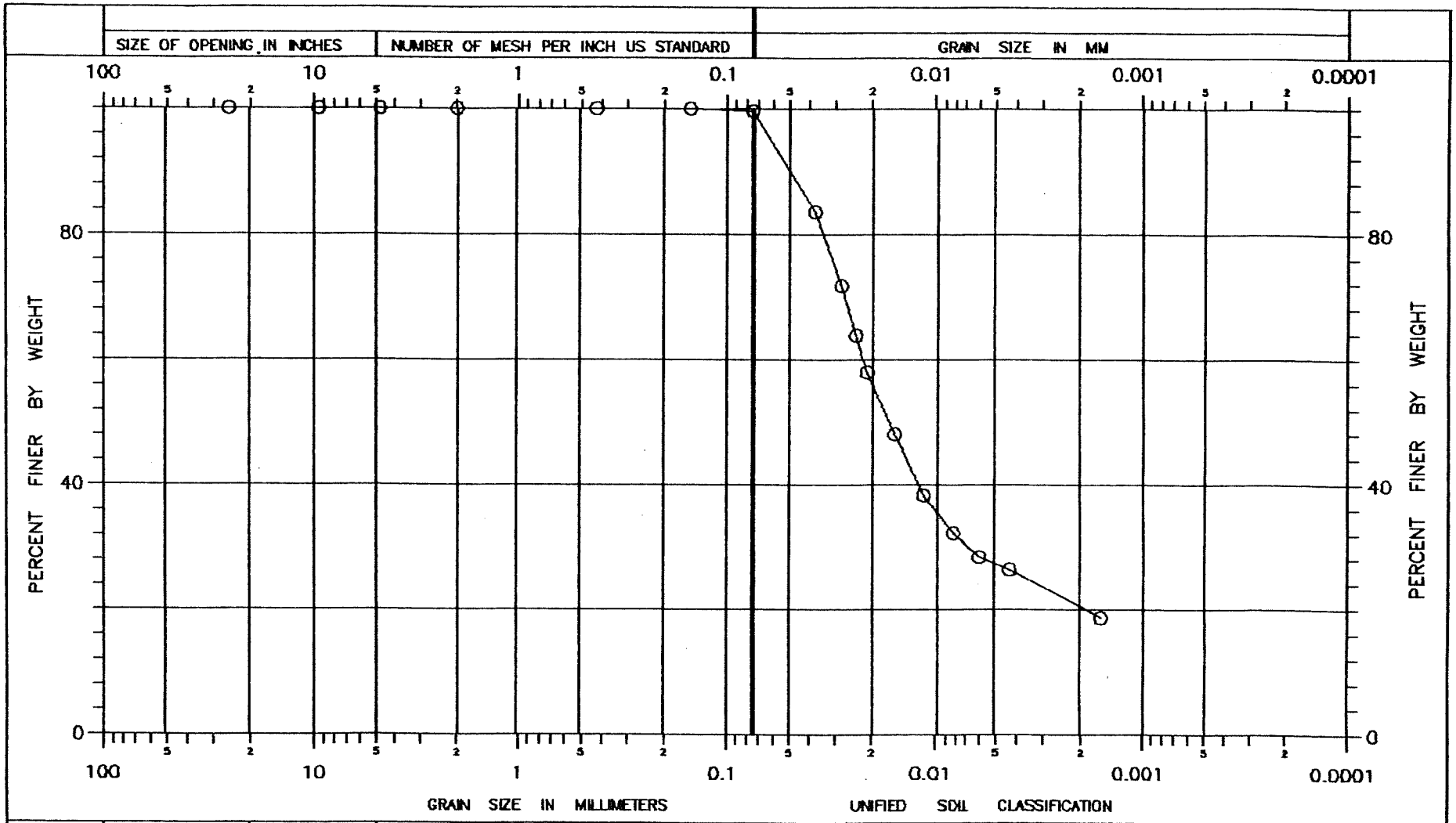


BORING NO. Test Pit 14	GRAVEL 4.01%	F. SAND 37.13%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO. S4-14	C. SAND 1.12%	SILT 20.63%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 9'-10'	M. SAND 6.11%	CLAY 31.0%	D_{10}	UNIFIED CLASS CL	
ELEV.					

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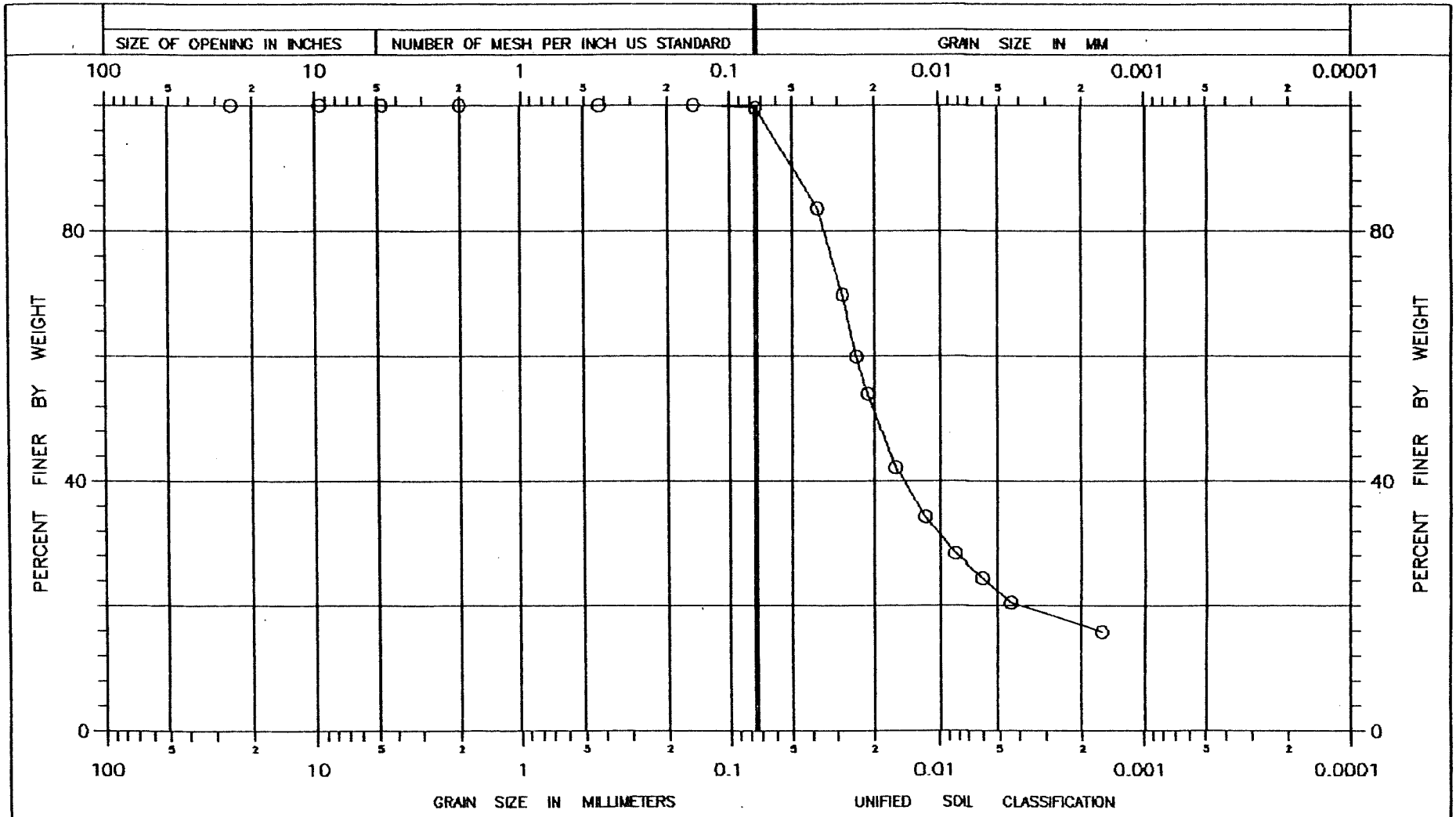
BORING NO.	Test Pit 15	GRAVEL	0.0%	F. SAND	0.37%	D_{60}	C_u
SAMPLE NO.	S1–15	C. SAND	0.0%	SILT	72.63%	D_{30}	C_z
DEPTH	1'–2'	M. SAND	0.0%	CLAY	27.0%	D_{10}	UNIFIED CLASS CL
ELEV.							

○○○○○ MECHANICAL
○○○○○ HYDROMETER

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DATE: 9/28/89
JOB NO: 70389

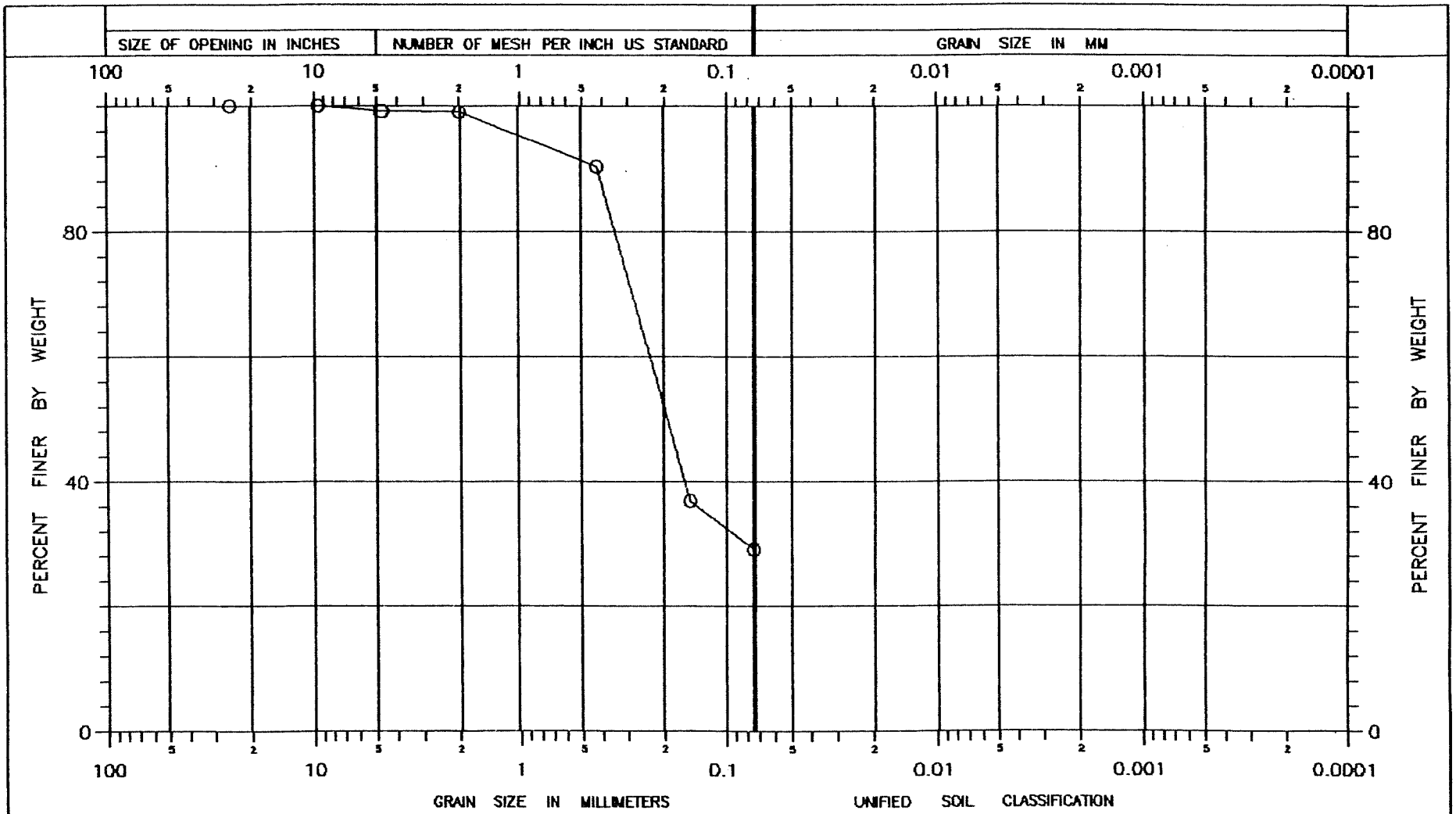


BORING NO.	Test Pit 15	GRAVEL 0.0%	F. SAND 0.44%	D_{60}	C_u	MECHANICAL
SAMPLE NO.	S2-15	C. SAND 0.0%	SILT 77.56%	D_{30}	C_z	HYDROMETER
DEPTH	3'-4'	M. SAND 0.0%	CLAY 22.0%	D_{10}	UNIFIED CLASS CL	
ELEV.						

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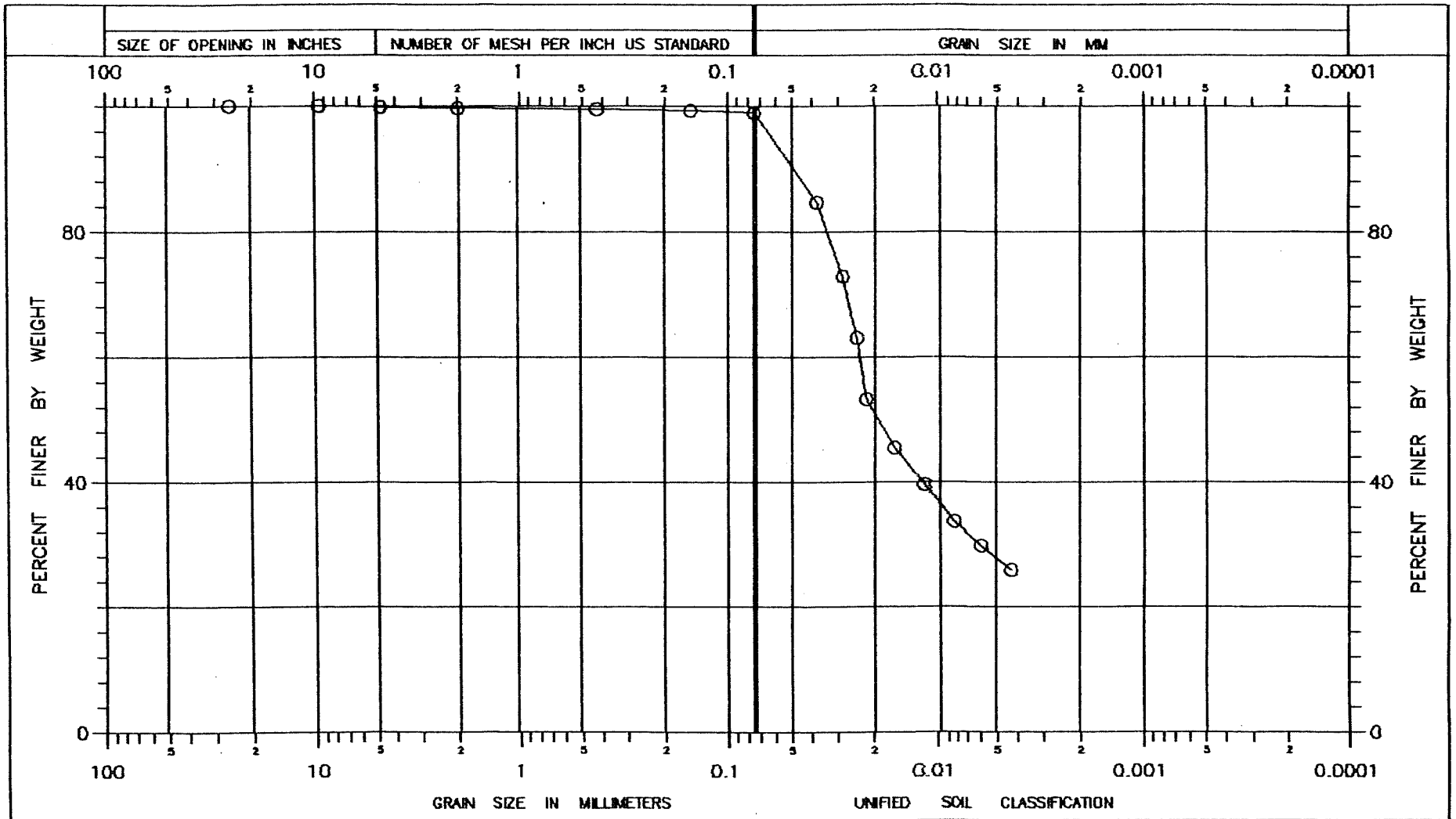
BORING NO.	Test Pit 15	GRAVEL 0.83%	F. SAND 61.25%		D_{60}	C_U
SAMPLE NO.	S3-15	C. SAND 0.15%	SILT	P200= 29.12%	D_{30}	C_z
DEPTH	8'-9'	M. SAND 8.65%	CLAY		D_{10}	UNIFIED CLASS SC
ELEV.						

○○○○○ MECHANICAL
○○○○○ HYDROMETER

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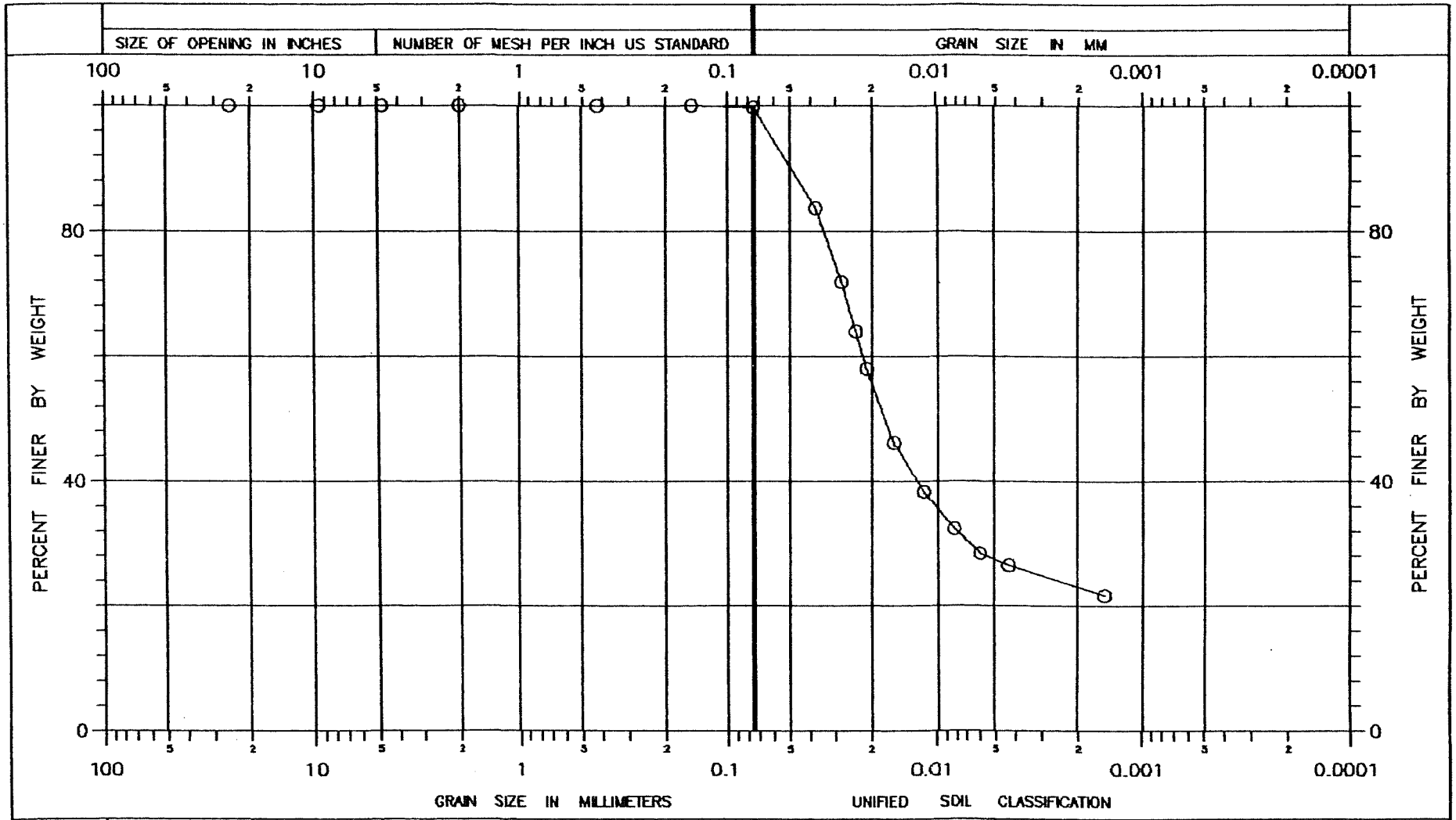
BORING NO.	Test Pit 20	GRAVEL	0.0%	F. SAND	0.23%	D_{60}	C_U
SAMPLE NO.	S1-20	C. SAND	0.0%	SILT	73.77%	D_{30}	C_z
DEPTH	2'-3'	M. SAND	0.0%	CLAY	26.0%	D_{10}	UNIFIED CLASS CL
ELEV.							

○○○○○ MECHANICAL
○○○○○ HYDROMETER

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JOB NO: 70389

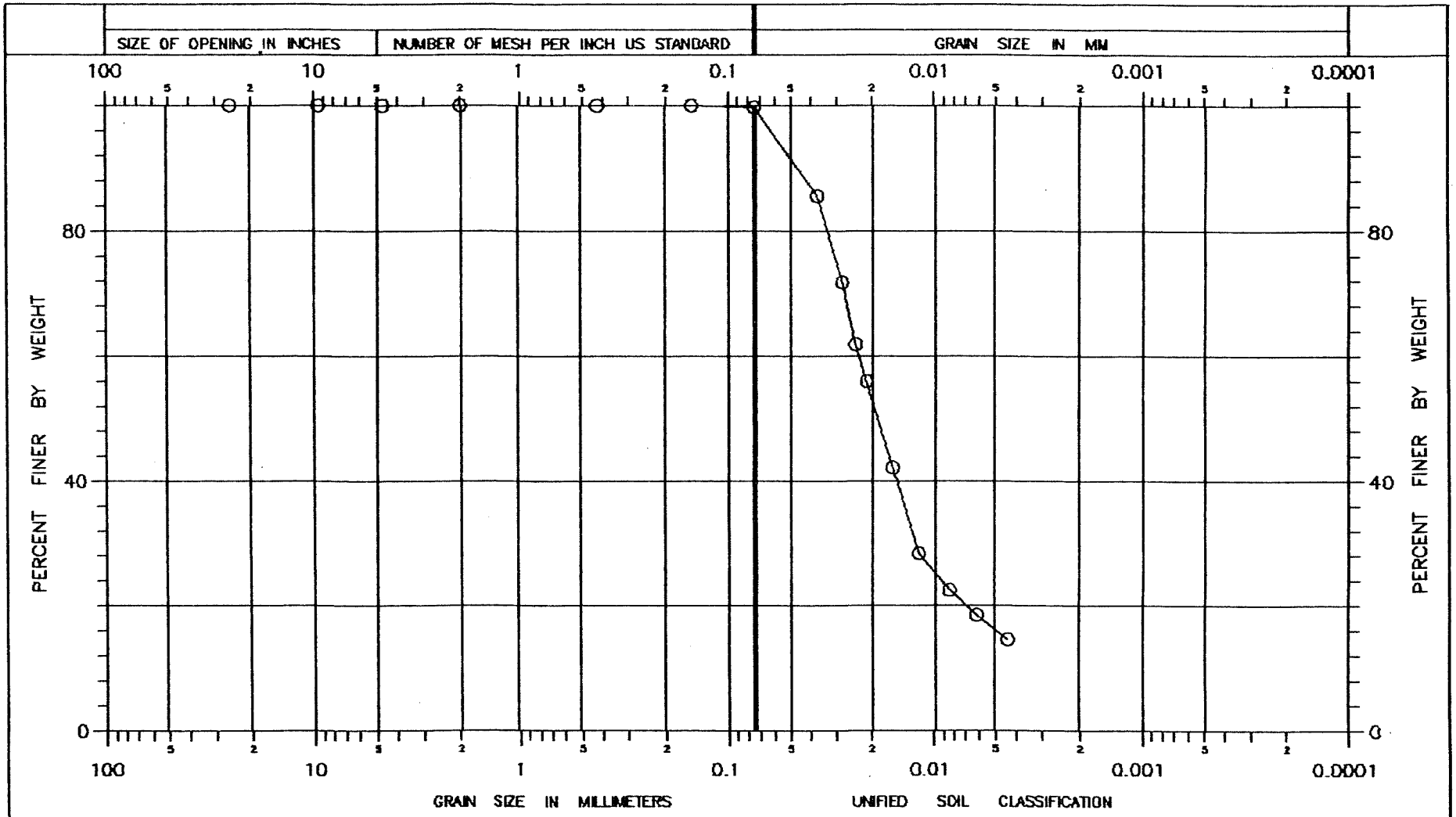


BORING NO. Test Pit 20	GRAVEL 0.0%	F. SAND 0.29%		D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO. S2-20	C. SAND 0.0%	SILT 72.71%		D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 4'-5'	M. SAND 0.0%	CLAY 27.0%		D_{10}	UNIFIED CLASS CL	
ELEV.						

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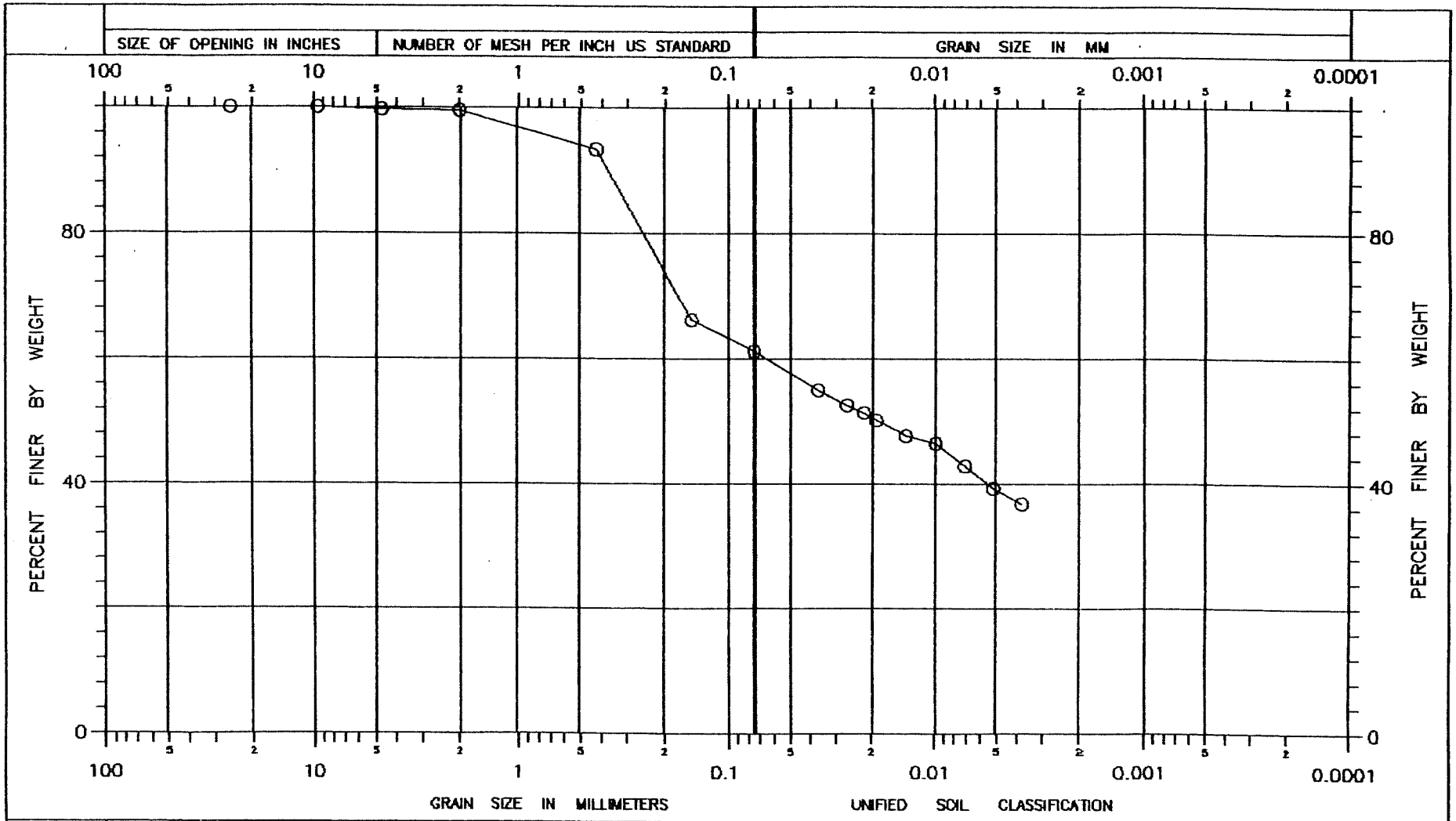


BORING NO. Test Pit 20	GRAVEL 0.0%	F. SAND 0.3%		D_{60}	C_u	○ MECHANICAL
SAMPLE NO. S3-20	C. SAND 0.0%	SILT 83.7%		D_{30}	C_z	○ HYDROMETER
DEPTH 8'-9'	M. SAND 0.0%	CLAY 16.0%		D_{10}	UNIFIED CLASS CL	
ELEV.						

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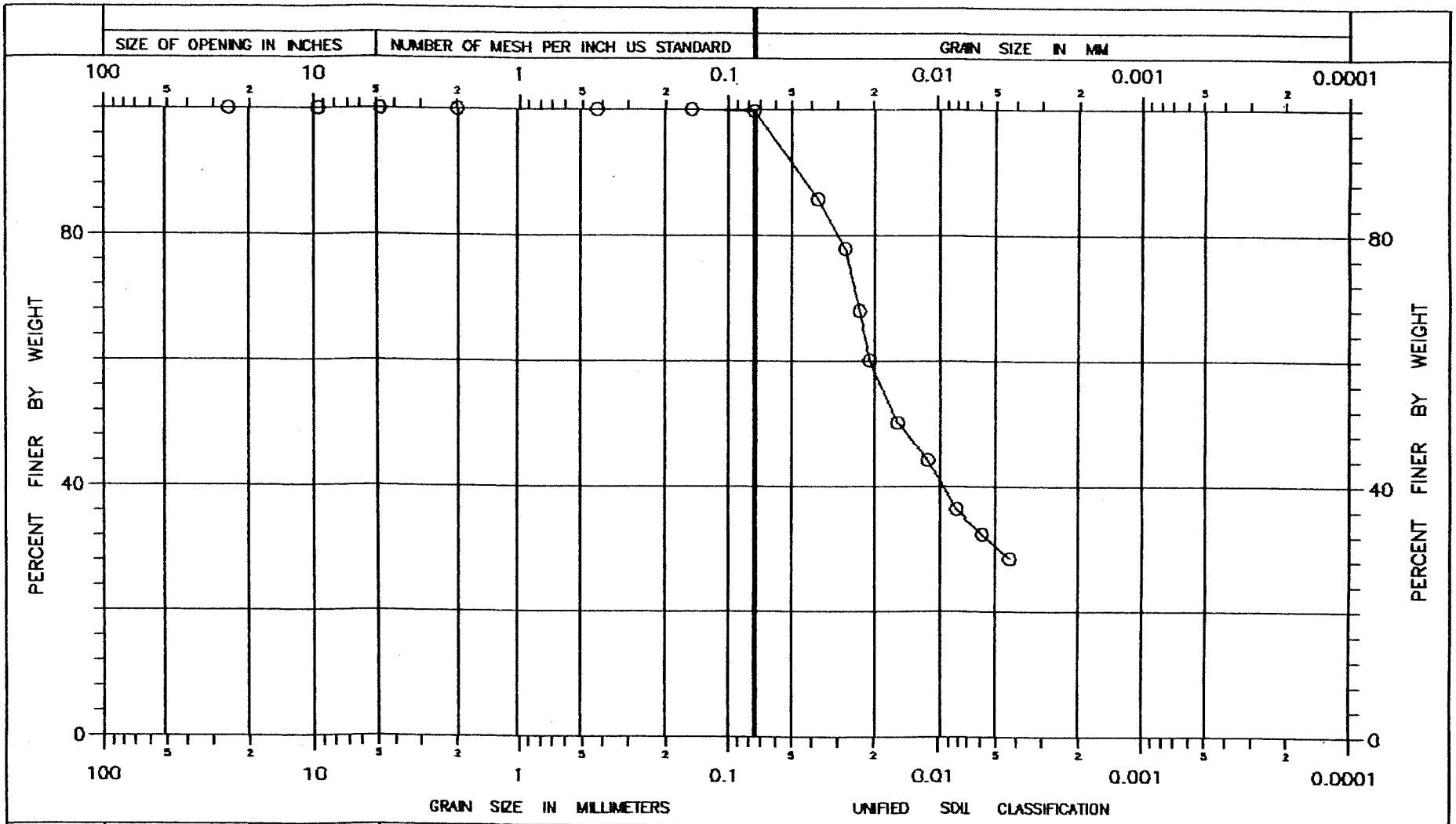
BORING NO.	Test Pit 20	GRAVEL	0.35%	F. SAND	32.14%	D_{60}	C_U
SAMPLE NO.	S4-20	C. SAND	0.15%	SILT	22.21%	D_{30}	C_z
DEPTH	10'-11'	M. SAND	6.15%	CLAY	39.0%	D_{10}	UNIFIED CLASS CL
ELEV.							

○○○○○ MECHANICAL
○○○○○ HYDROMETER

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 10/1/89
JOB NO: 70389

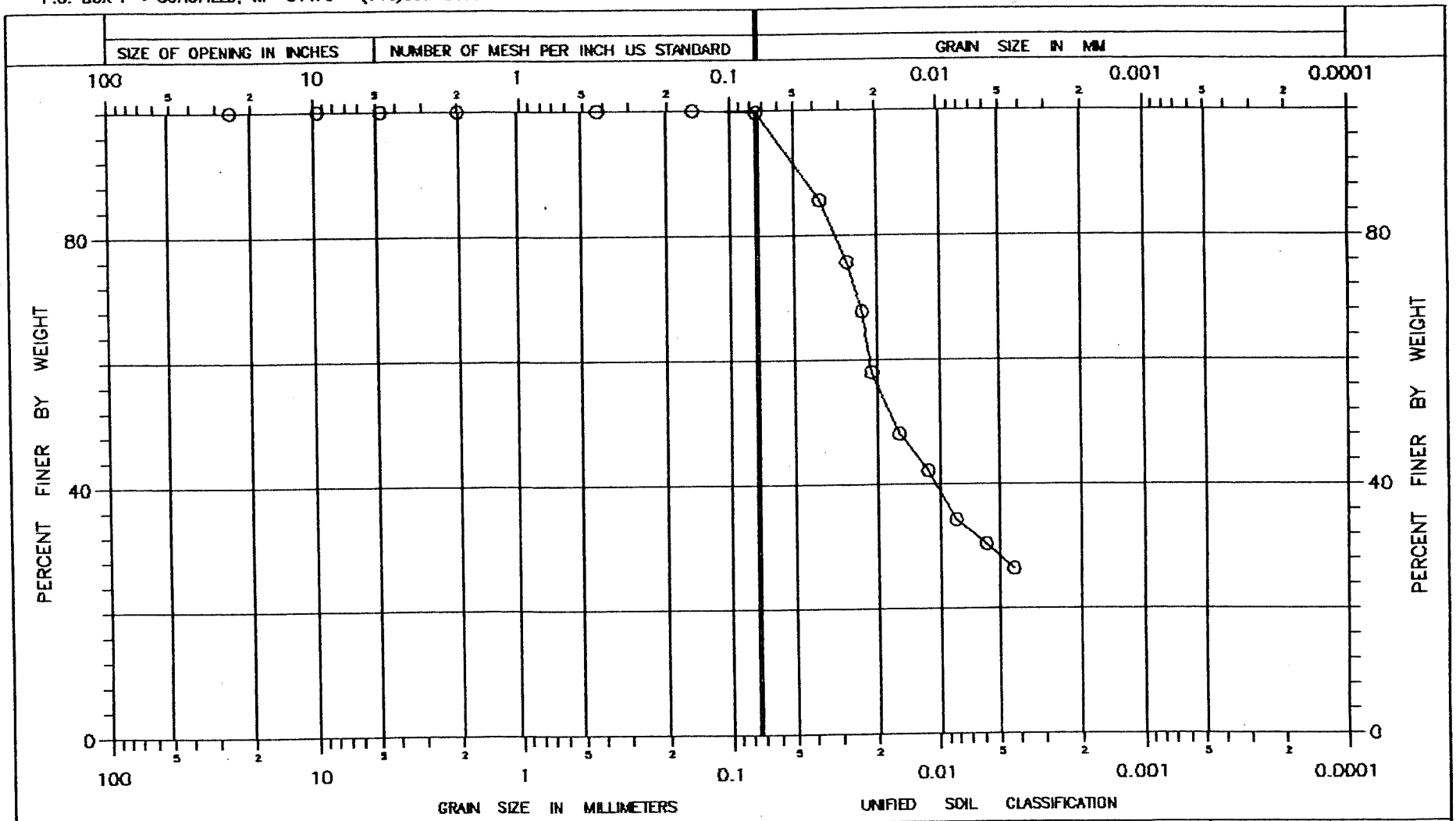


BORING NO.	Test Pit 21	GRAVEL 0.0%	F. SAND 0.27%		D_{60}	C_U	○○○○○ MECHANICAL
SAMPLE NO.	S1-21	C. SAND 0.0%	SILT 69.73%		D_{30}	C_z	○○○○○ HYDROMETER
DEPTH	2'-3'	M. SAND 0.0%	CLAY 30.0%		D_{10}	UNIFIED CLASS CL	
ELEV.							

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 10/1/89
JOB NO: 70389

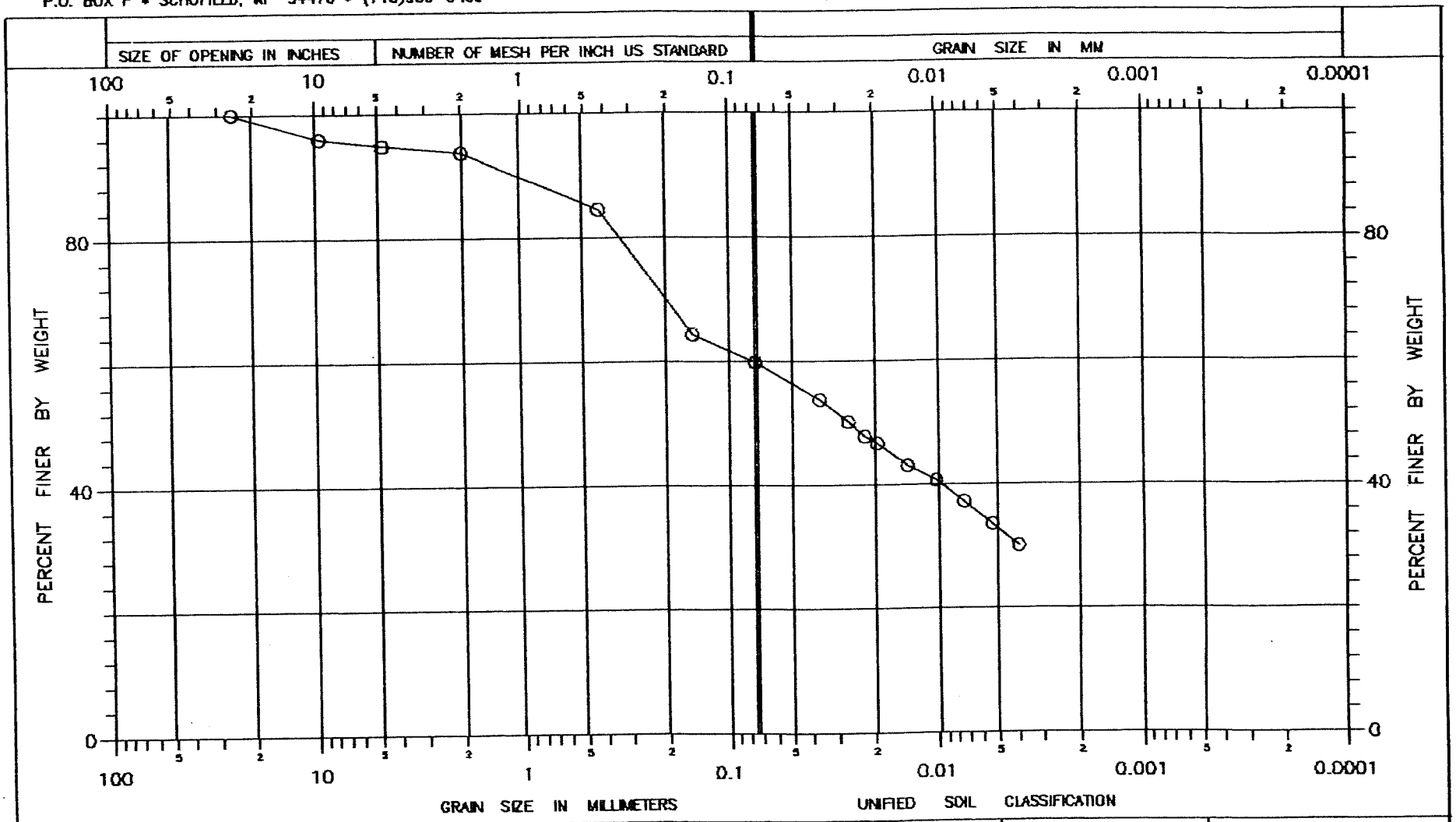


BORING NO. Test Pit 21	GRAVEL 0.0%	F. SAND 0.36%	D_{60}	C_U	○ MECHANICAL
SAMPLE NO. S2-21	C. SAND 0.0%	SILT 71.64%	D_{30}	C_z	○ HYDROMETER
DEPTH 6'-7'	M. SAND 0.0%	CLAY 28.0%	D_{10}	UNIFIED CLASS CH	
ELEV.					

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/29/89
JOB NO: 70389

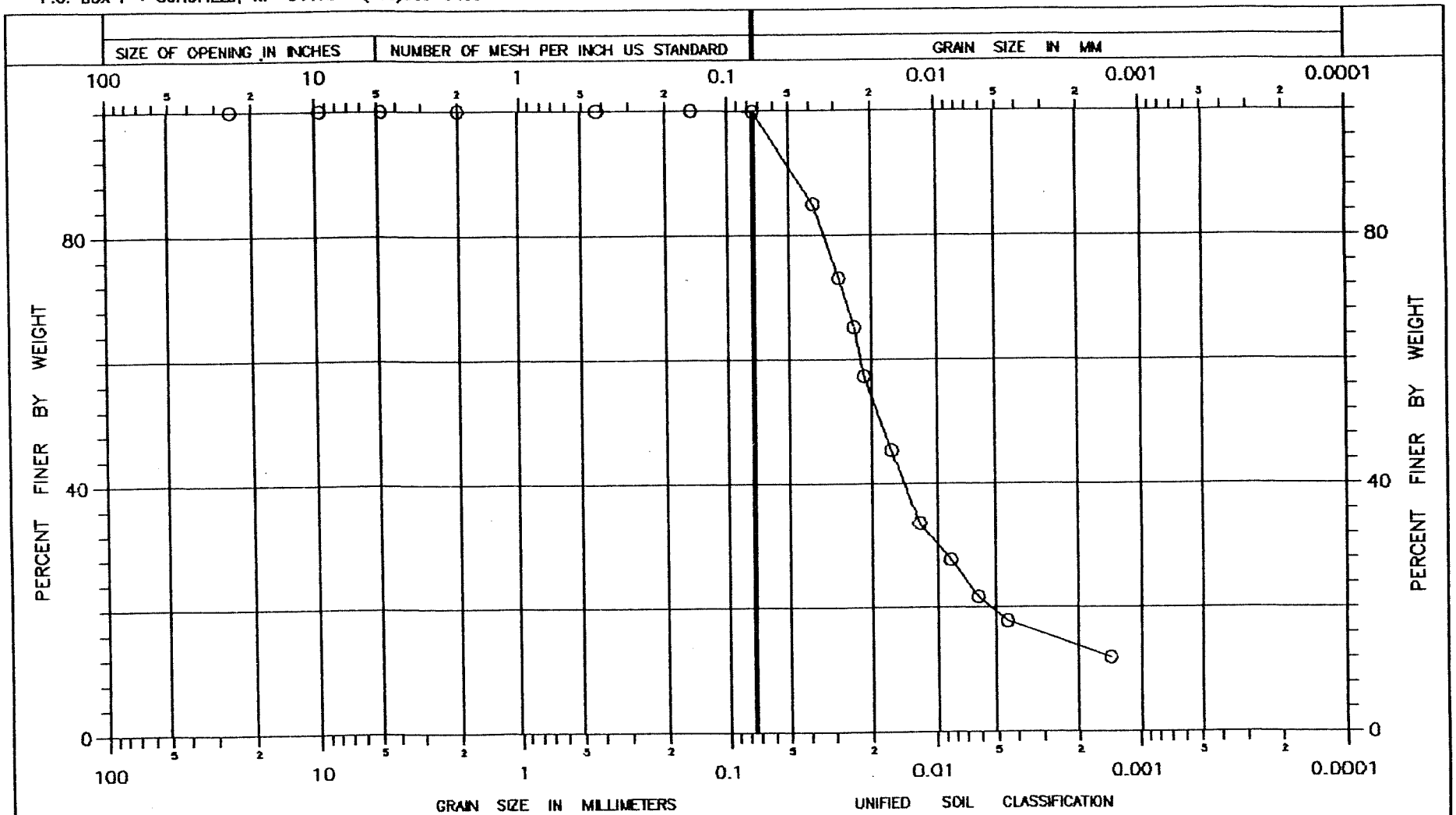


BORING NO. Test Pit 21	GRAVEL 5.19%	F. SAND 24.71%	D_{60}	C_U	○○○○○ MECHANICAL
SAMPLE NO. S3-21	C. SAND 1.07%	SILT 27.81%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 10'-11'	M. SAND 9.22%	CLAY 32.0%	D_{10}	UNIFIED CLASS CH	
ELEV.					

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/29/89
JOB NO: 70389

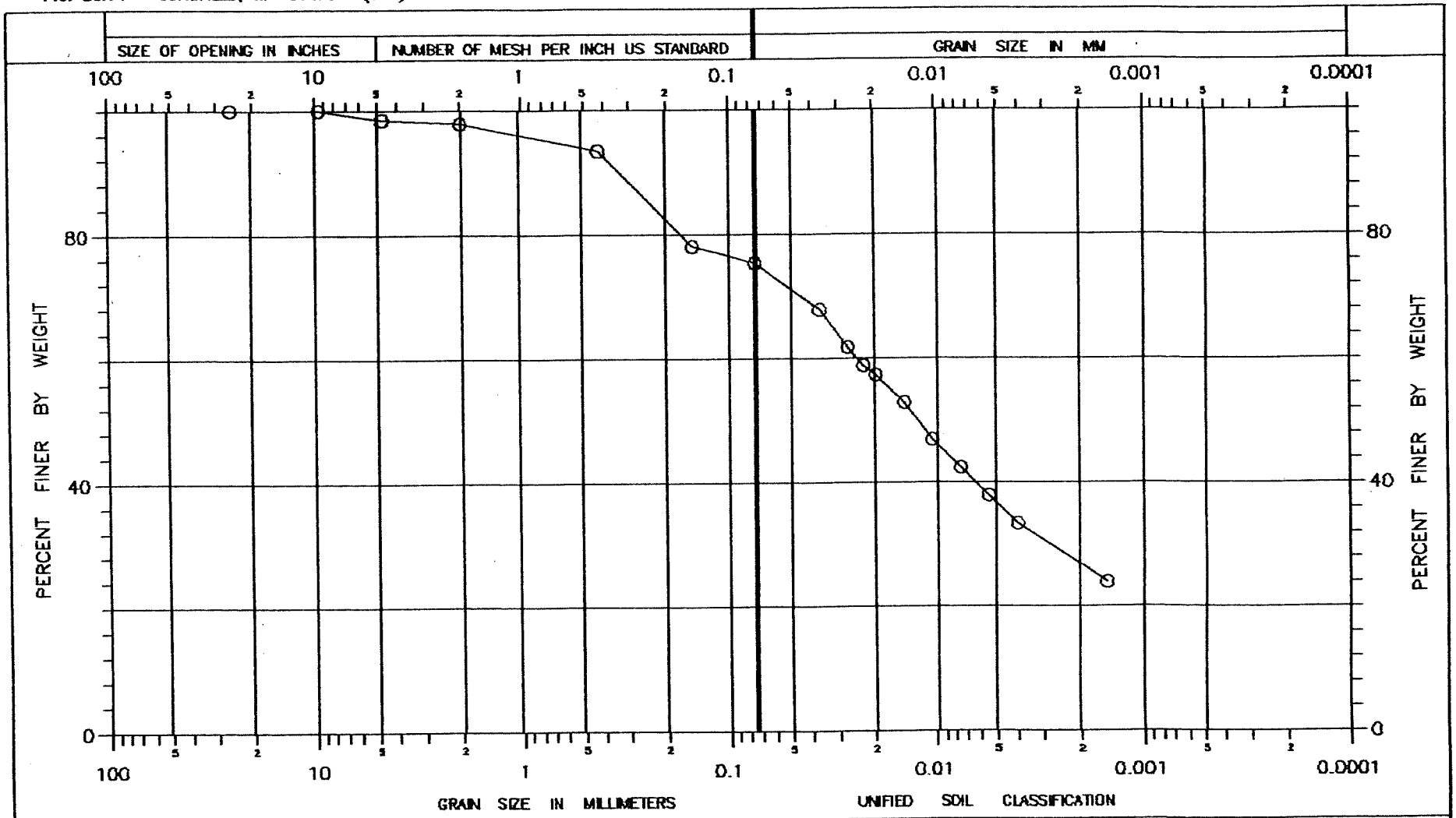


BORING NO. Test Pit 22	GRAVEL 0.0%	F. SAND 0.19%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO. S1-22	C. SAND 0.0%	SILT 80.81%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 3'-4'	M. SAND 0.0%	CLAY 19.0%	D_{10}	UNIFIED CLASS CL	
ELEV.					

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/28/89
JOB NO: 70389



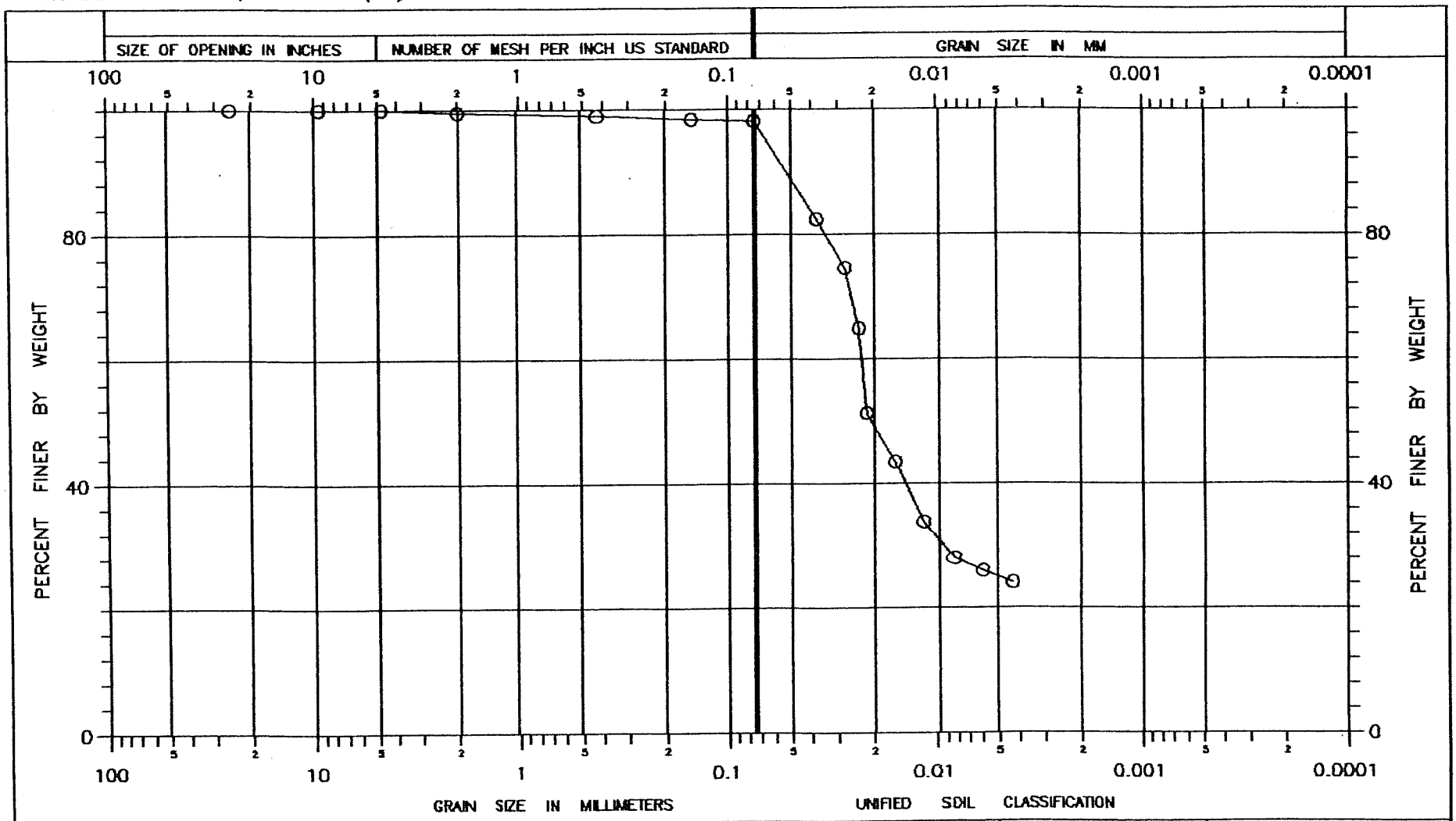
BORING NO.	Test Pit 22	GRAVEL	1.51%	F. SAND	18.08%	D_{60}	C_u
SAMPLE NO.	S3–22	C. SAND	0.66%	SILT	39.36%	D_{30}	C_z
DEPTH	9'–10'	M. SAND	4.39%	CLAY	36.0%	D_{10}	UNIFIED CLASS CL
ELEV.							

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 10/1/89
JOB NO: 70389

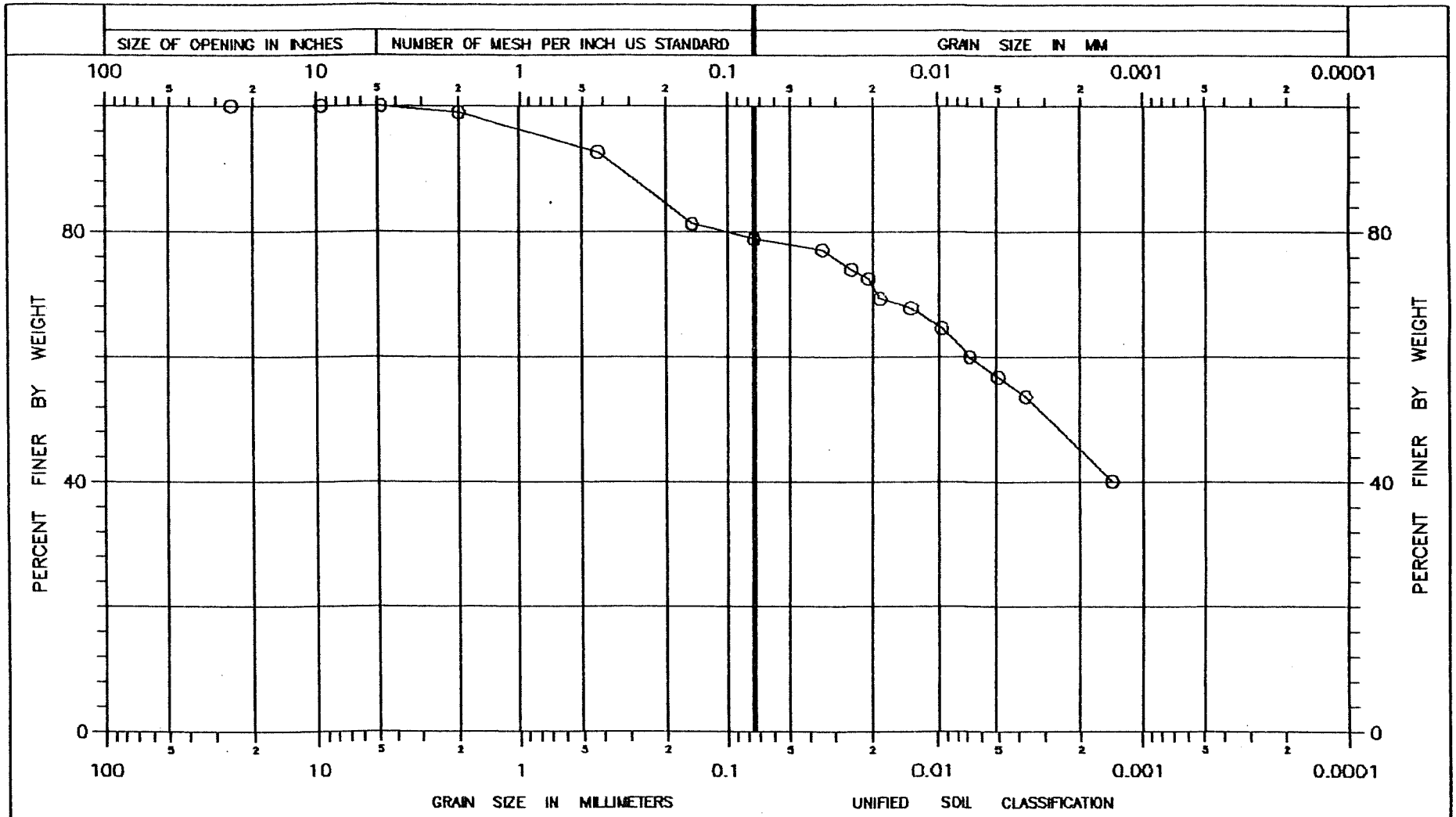


BORING NO. Test Pit 25	GRAVEL 0.0%	F. SAND 0.85%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO. S1-25	C. SAND 0.5%	SILT 73.08%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 1.5'-2.5'	M. SAND 0.56%	CLAY 25.0%	D_{10}	UNIFIED CLASS CL	
ELEV.					

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 10/4/89
JOB NO: 70389

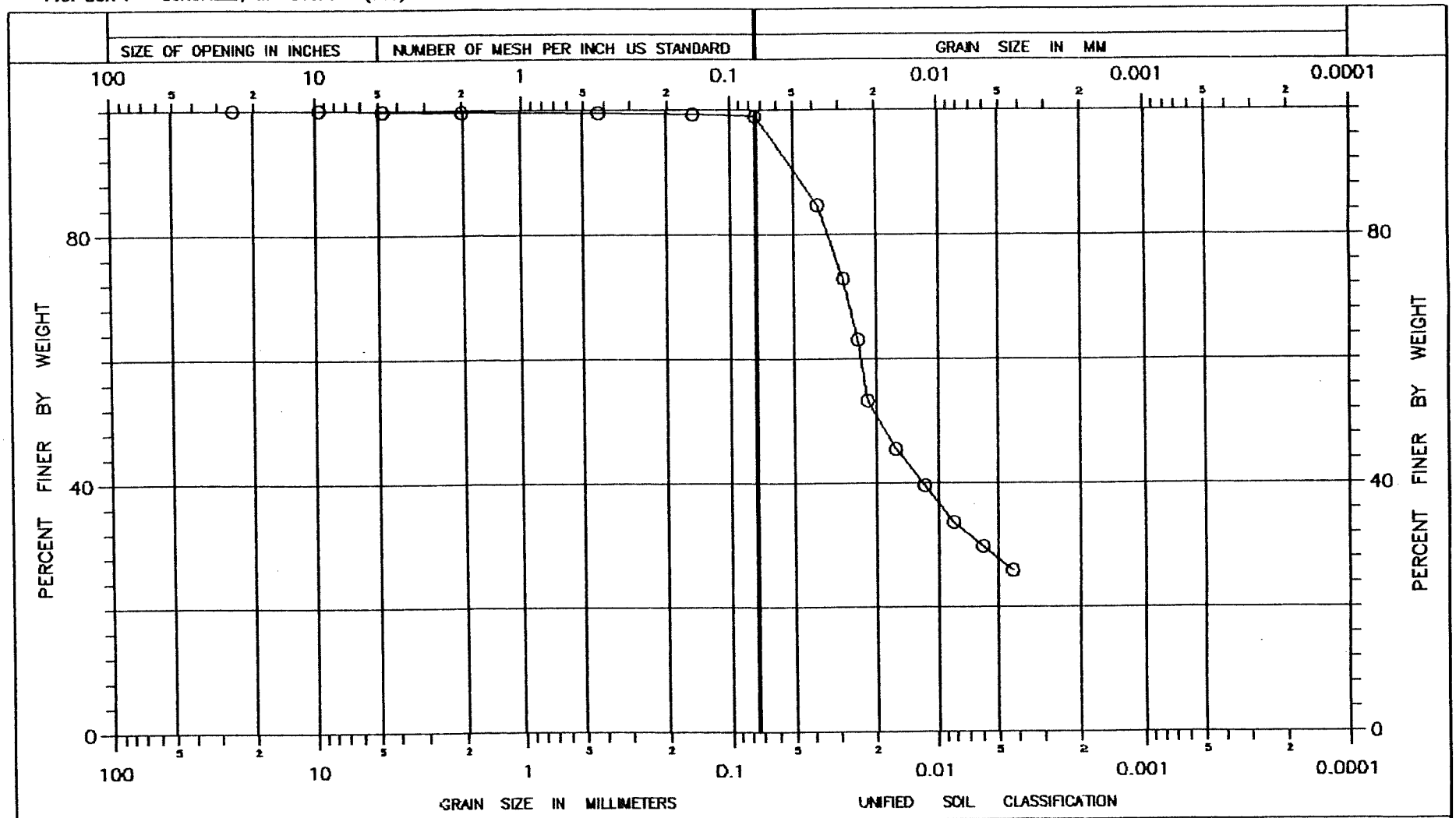


BORING NO. Test Pit 25	GRAVEL 0.0%	F. SAND 13.81%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO. S2-25	C. SAND 1.03%	SILT 21.85%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 4'-5'	M. SAND 6.31%	CLAY 57.0%	D_{10}	UNIFIED CLASS CH	
ELEV.					

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/29/89
JOB NO: 70389

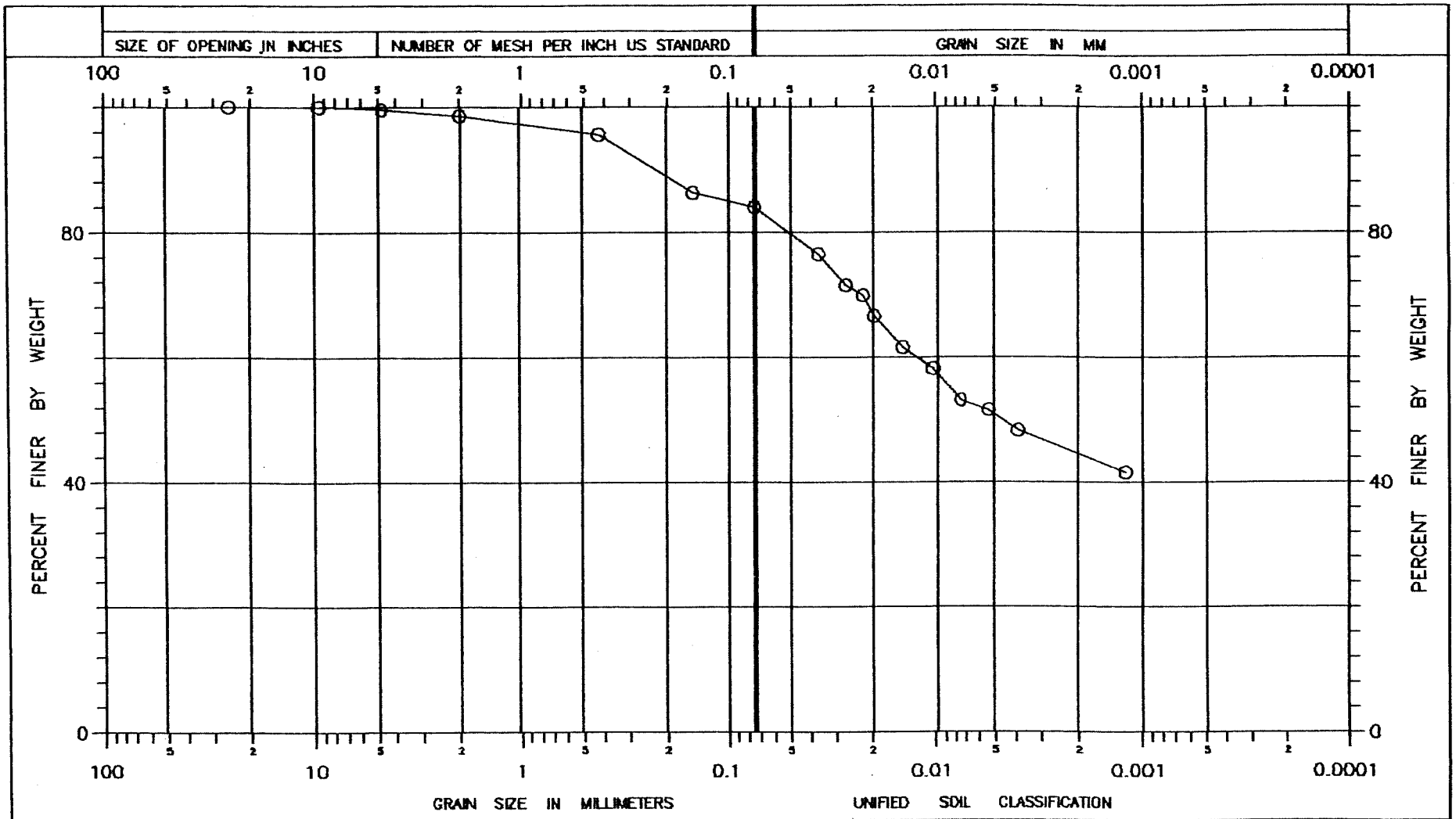


BORING NO. Test Pit 27	GRAVEL 0.21%	F. SAND 0.54%		D_{60}	C_U	○○○○○ MECHANICAL
SAMPLE NO. S1-27	C. SAND 0.13%	SILT 71.95%		D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 1.5'-2.5'	M. SAND 0.17%	CLAY 27.0%		D_{10}	UNIFIED CLASS CL	
ELEV.						

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/28/89
JOB NO: 70389



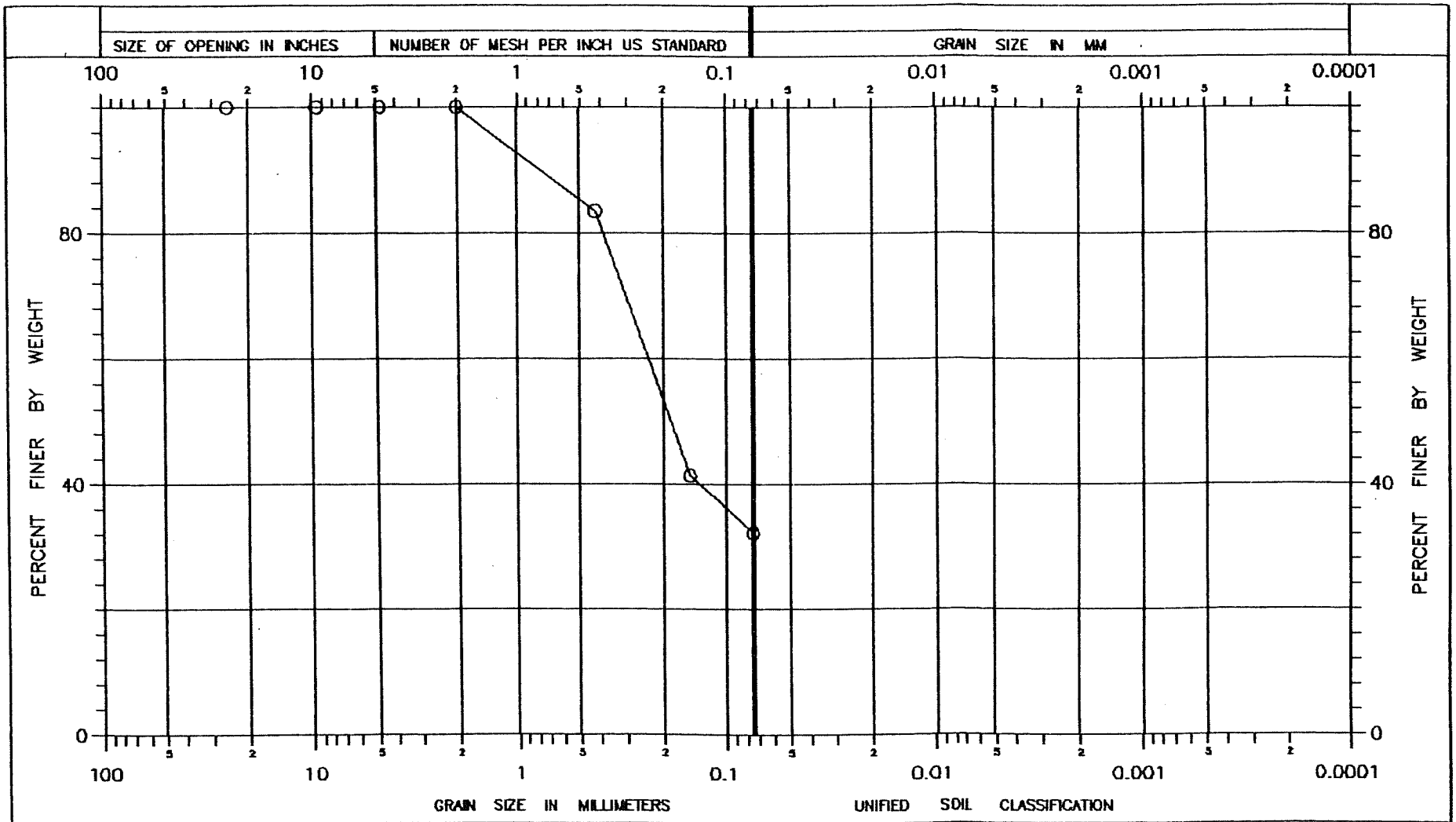
BORING NO.	Test Pit 27	GRAVEL	0.44%	F. SAND	11.55%	D_{60}	C_U
SAMPLE NO.	S2-27	C. SAND	0.97%	SILT	34.04%	D_{30}	C_z
DEPTH	4'-5'	M. SAND	3.0%	CLAY	50.0%	D_{10}	UNIFIED CLASS CH
ELEV.							

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 8/28/89
JOB NO: 70389

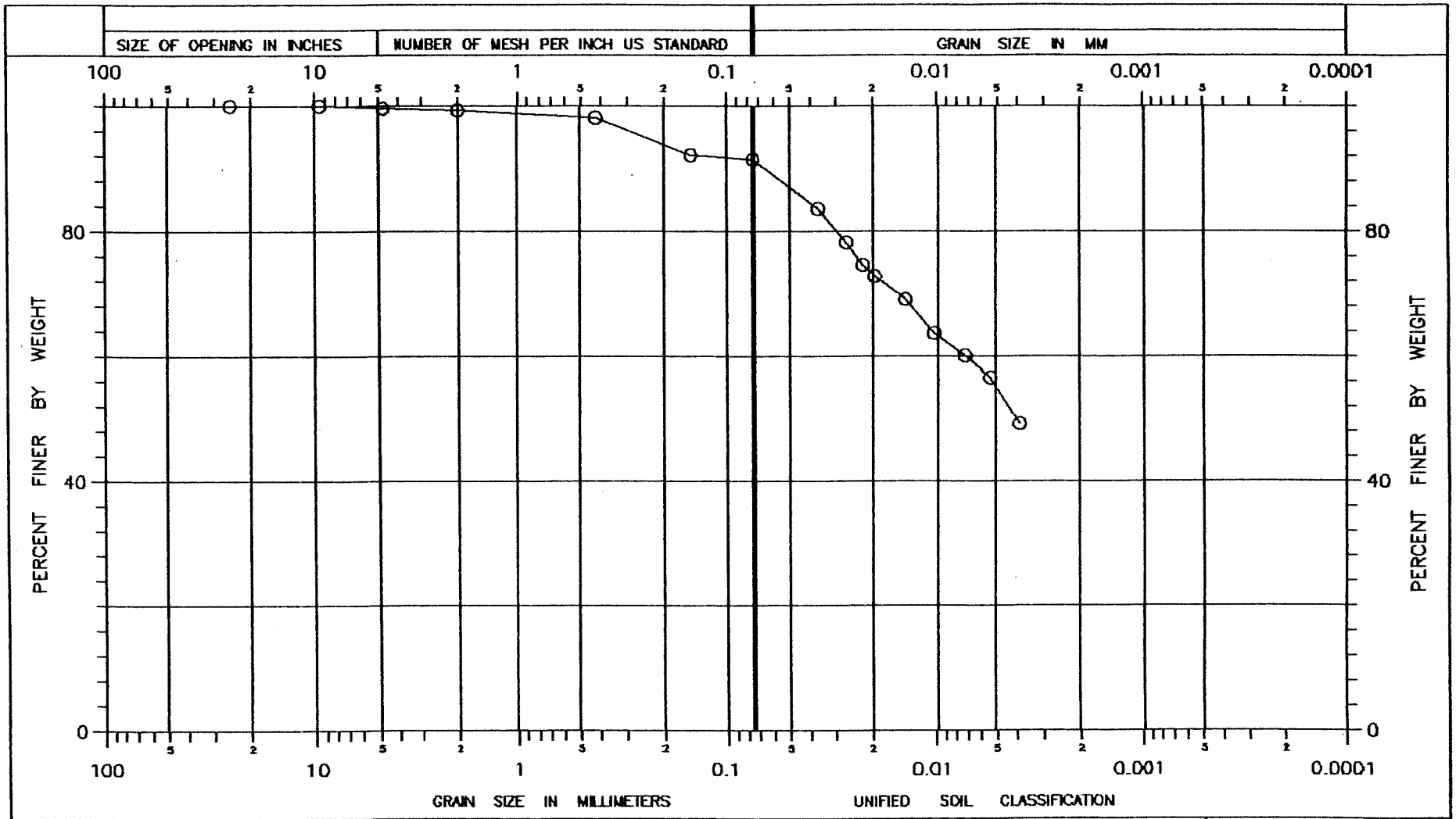


BORING NO. Test Pit 27	GRAVEL 0.0%	F. SAND 51.26%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO. S3-27	C. SAND 0.0%	SILT	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 7'-9'	M. SAND 16.5%	CLAY	D_{10}	UNIFIED CLASS SC	
ELEV.		P200= 32.24%			

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/29/89
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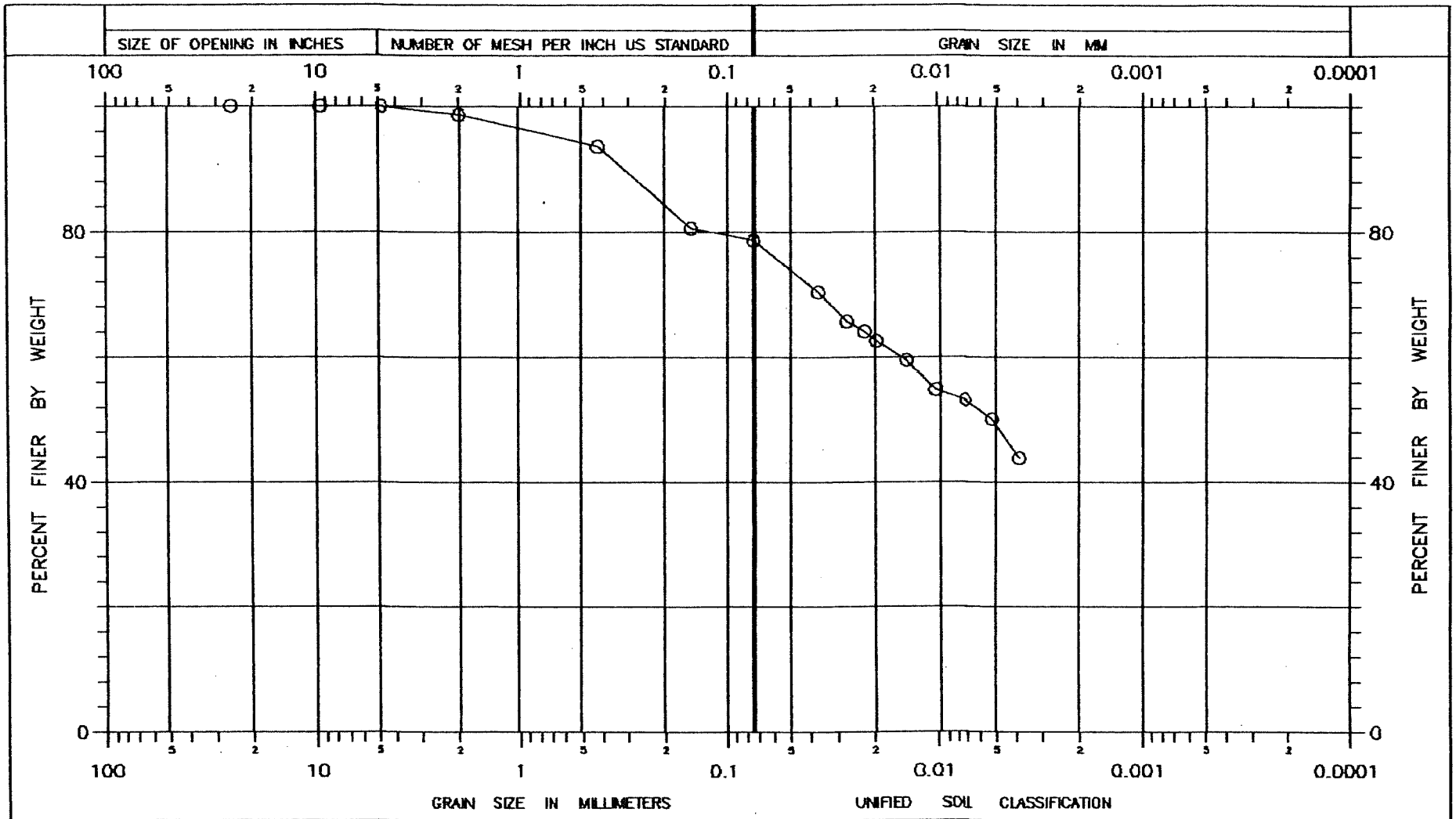
BORING NO.	Test Pit A	GRAVEL	0.42%	F. SAND	6.61%	D_{60}	C_u
SAMPLE NO.	S1-A	C. SAND	0.29%	SILT	37.49%	D_{30}	C_z
DEPTH	4'-5'	M. SAND	1.19%	CLAY	54.0%	D_{10}	UNIFIED CLASS CH
ELEV.							

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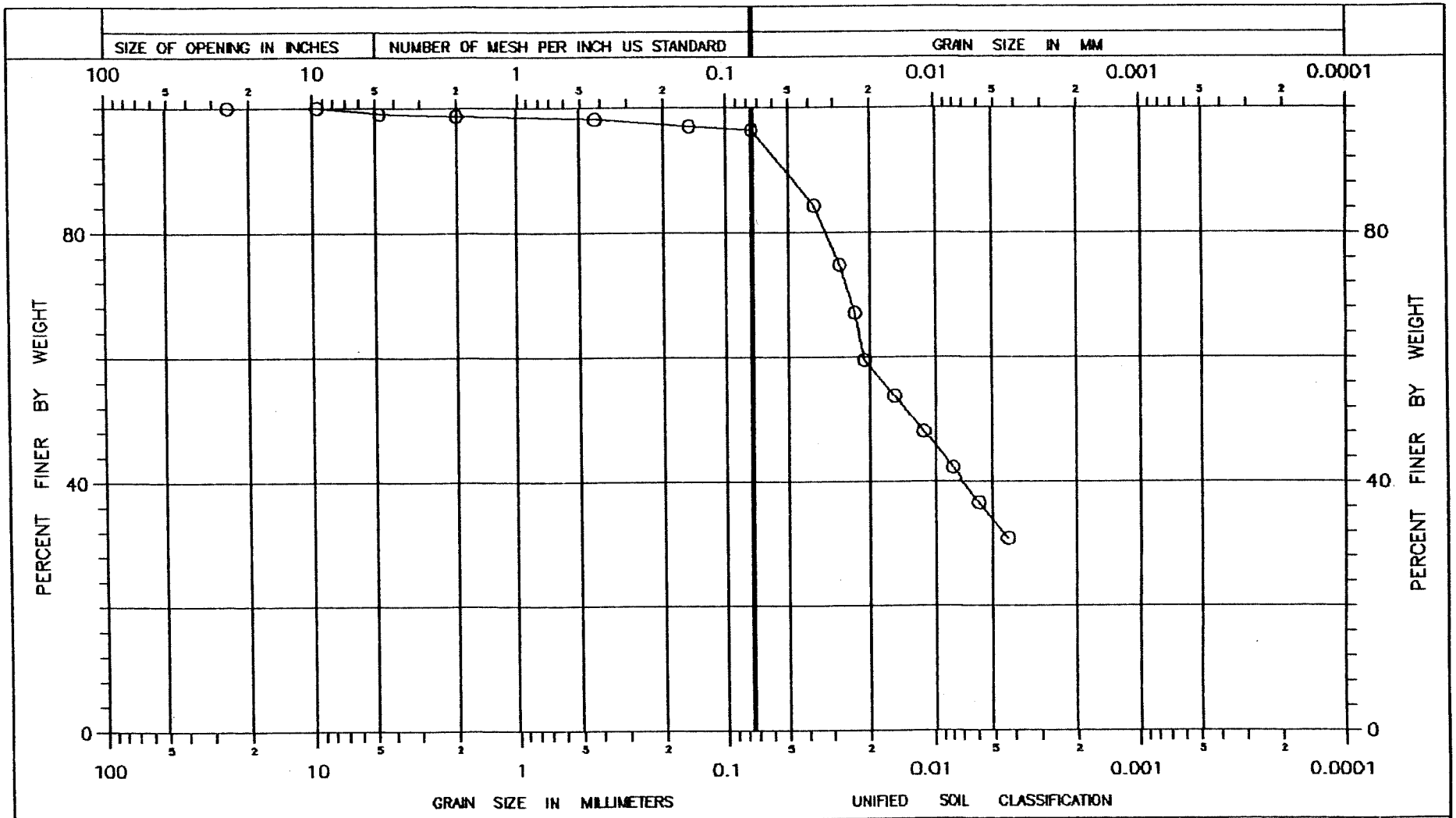
BORING NO.	Test Pit A	GRAVEL	0.0%	F. SAND	14.96%	D_{60}	C_u
SAMPLE NO.	S2-A	C. SAND	1.36%	SILT	28.64%	D_{30}	C_z
DEPTH	7'-8'	M. SAND	5.06%	CLAY	50.0%	D_{10}	UNIFIED CLASS CH
ELEV.							

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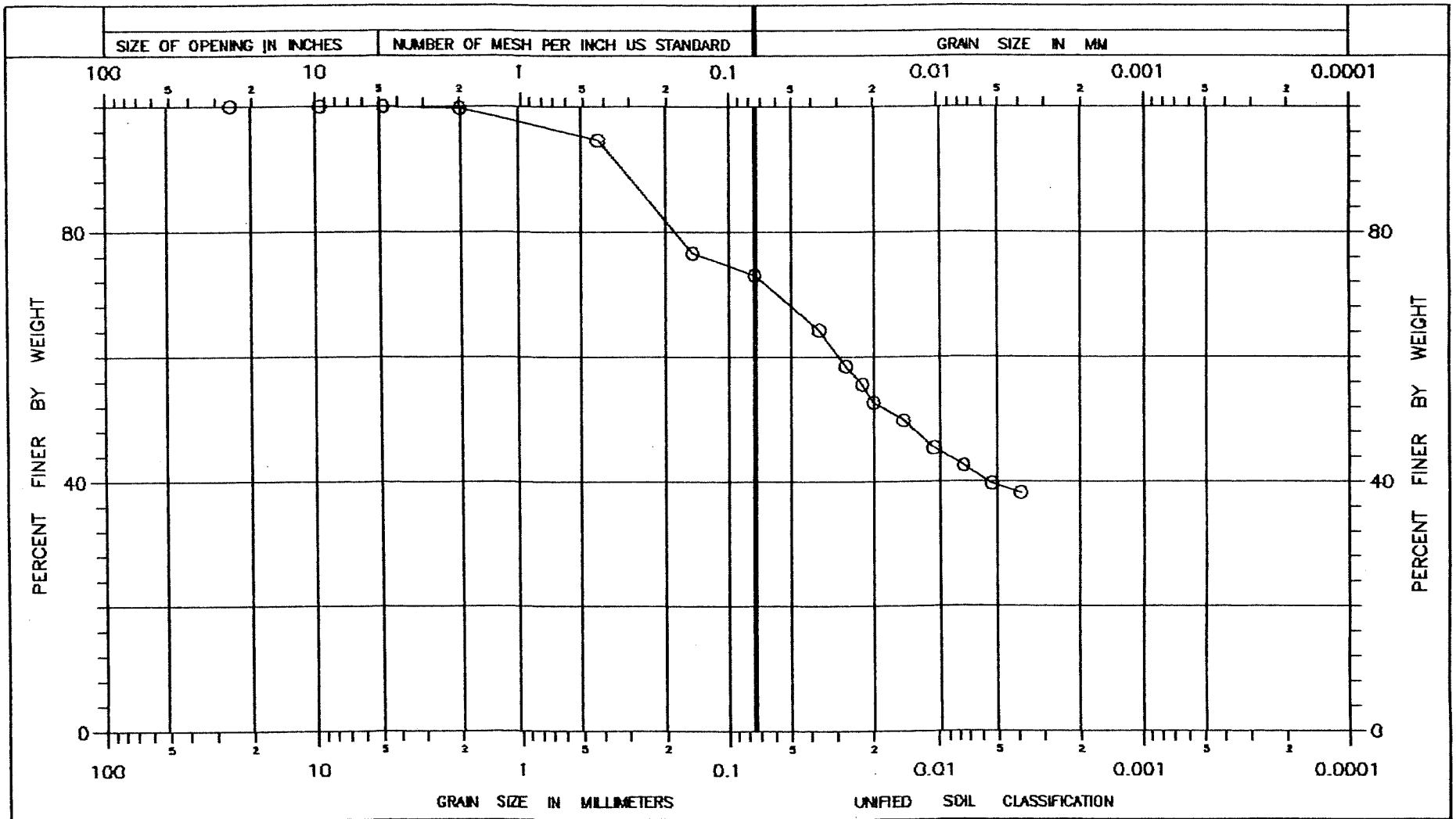
BORING NO.	Test Pit B	GRAVEL	0.96%	F. SAND	1.72%	D_{60}	C_u
SAMPLE NO.	S1-B	C. SAND	0.36%	SILT	62.40%	D_{30}	C_z
DEPTH	3'-4'	M. SAND	0.56%	CLAY	34.0%	D_{10}	UNIFIED CLASS CL
ELEV.							

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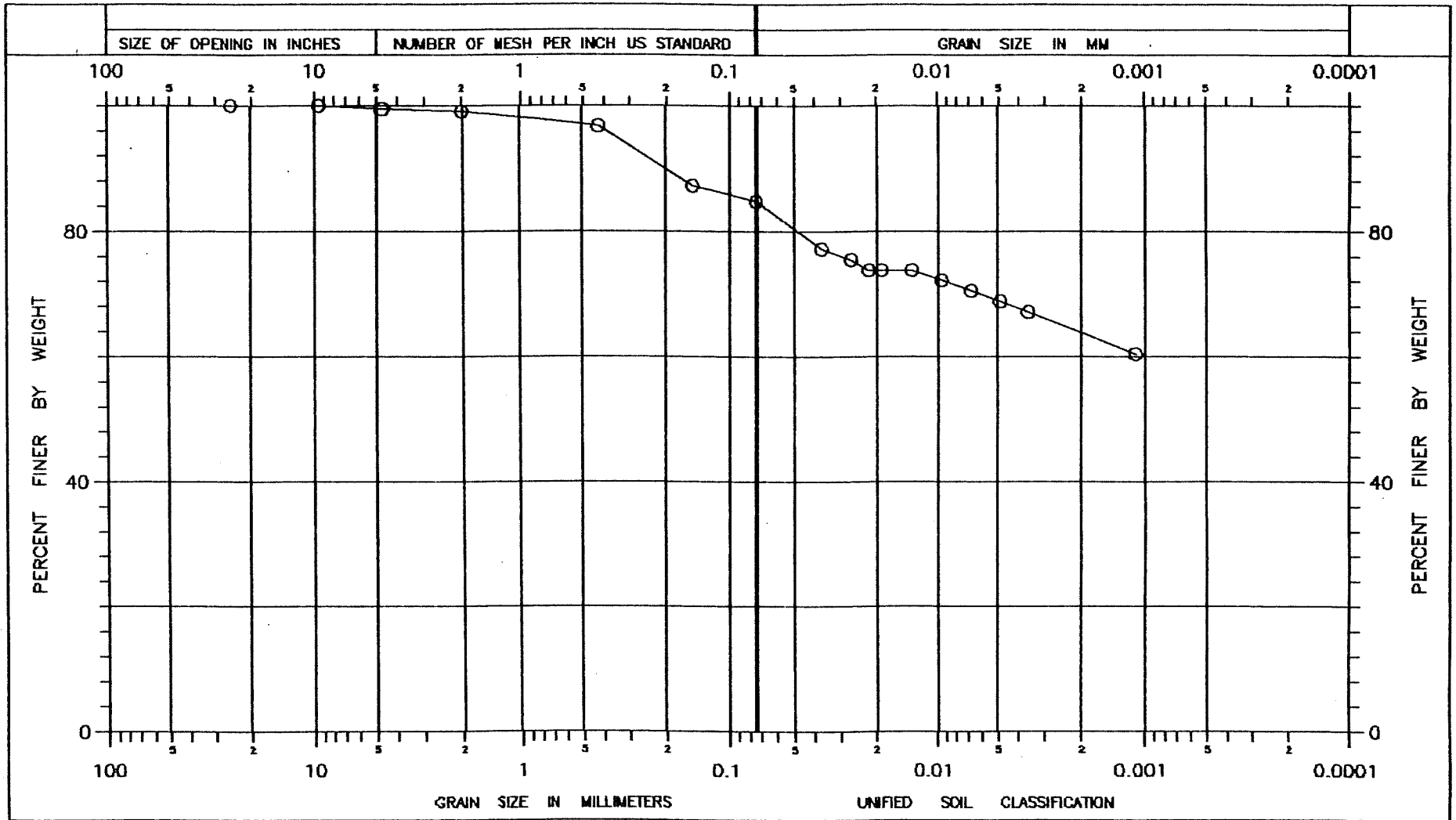
BORING NO.	Test Pit B	GRAVEL	0.0%	F. SAND	21.52%	D_{60}	C_U
SAMPLE NO.	S2-B	C. SAND	0.31%	SILT	34.09%	D_{30}	C_z
DEPTH	5'-6'	M. SAND	5.08%	CLAY	39.0%	D_{10}	UNIFIED CLASS CL
ELEV.							

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/28/89
JOB NO: 70389



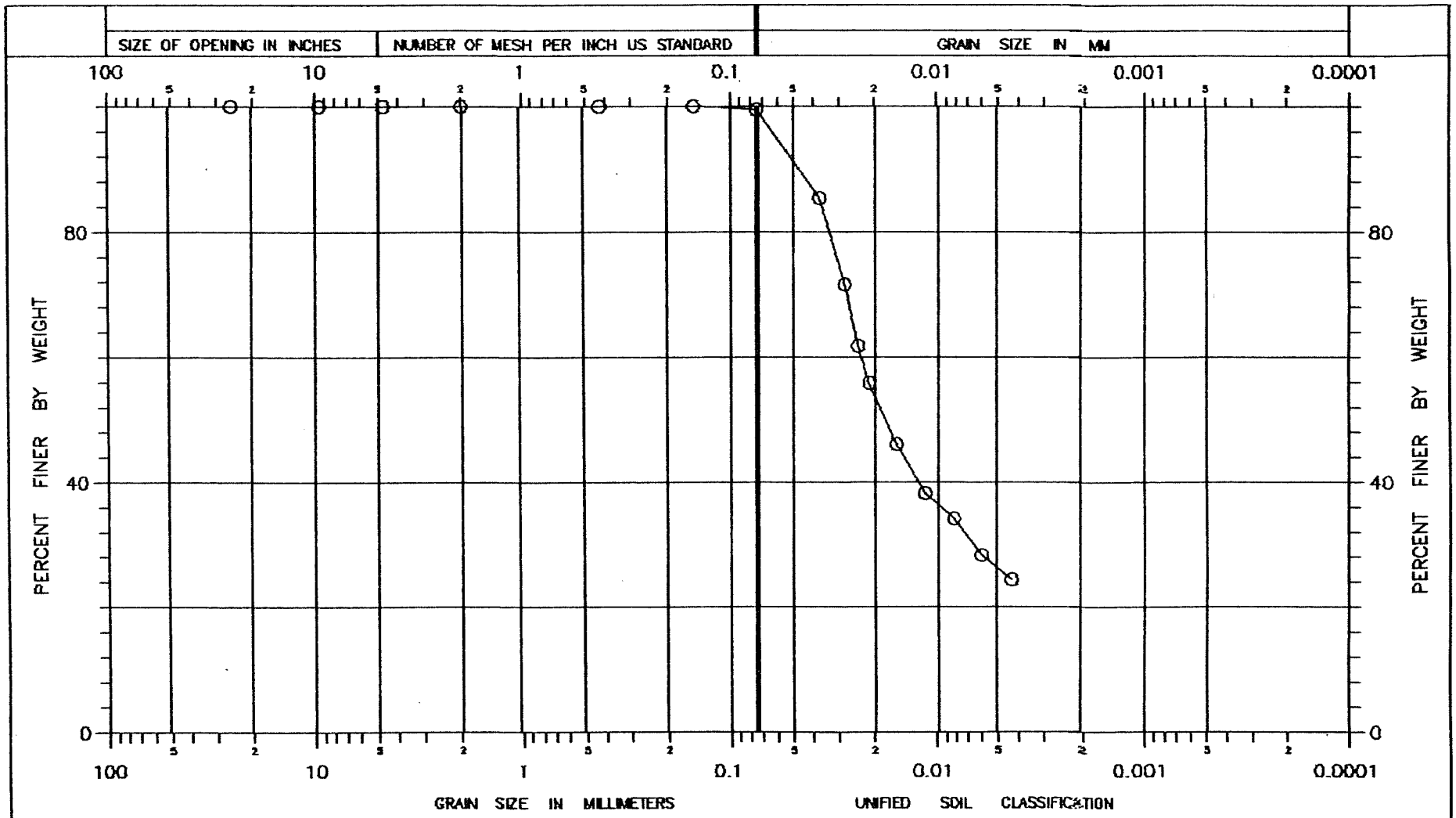
COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY	COLLOIDS
GRAVEL		SAND					

BORING NO.	Test Pit B	GRAVEL 0.54%	F. SAND 11.98%	D_{60}	C_U	○ MECHANICAL
SAMPLE NO.	S3-B	C. SAND 0.37%	SILT 15.76%	D_{30}	C_z	○ HYDROMETER
DEPTH	8'-9'	M. SAND 2.35%	CLAY 69.0%	D_{10}	UNIFIED CLASS CH	
ELEV.						

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 10/1/89
JOB NO: 70389

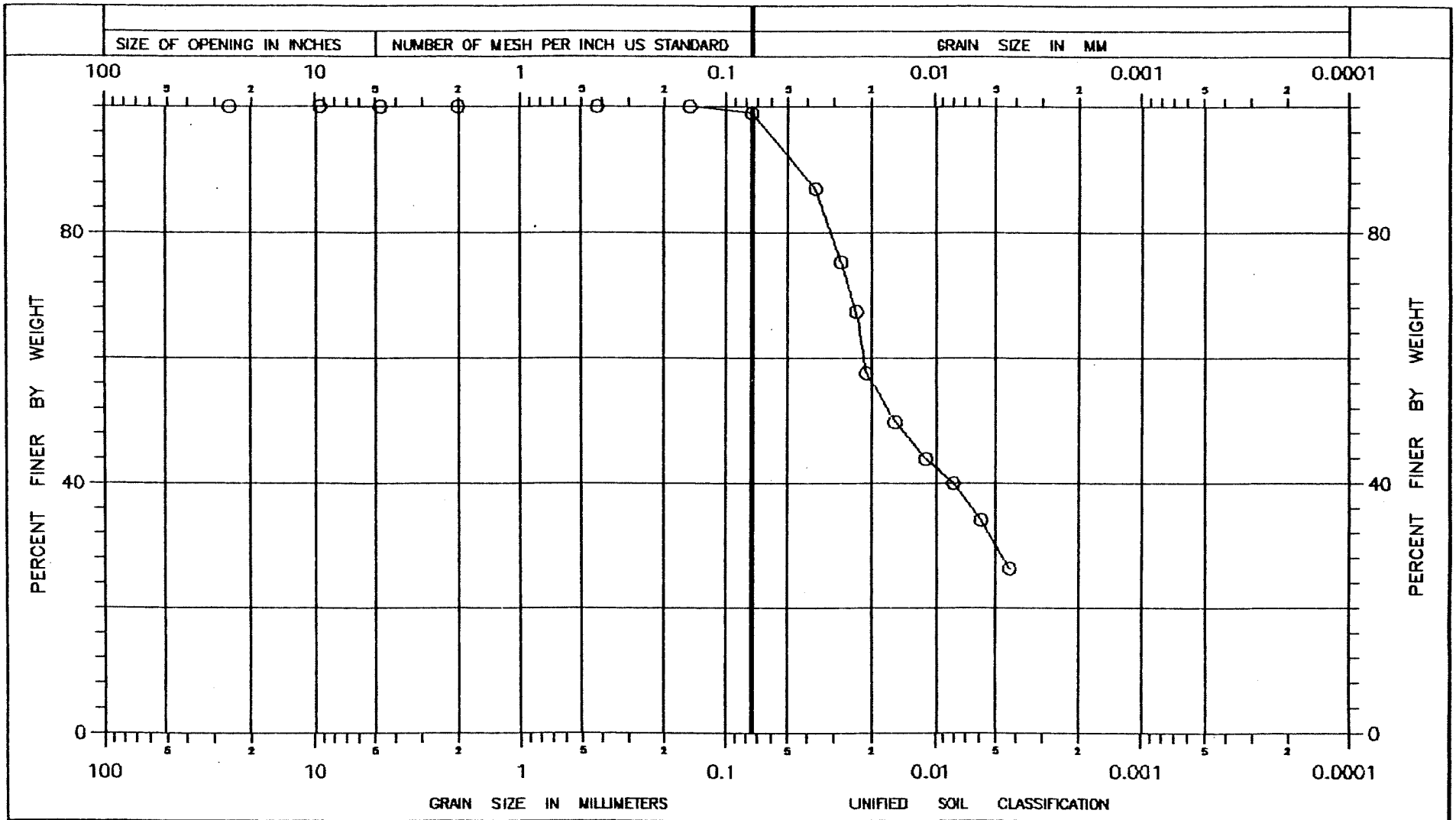


BORING NO.	Test Pit C	GRAVEL 0.0%	F. SAND 0.54%	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO.	S1-C	C. SAND 0.0%	SILT 73.46%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH	3'-3.5'	M. SAND 0.0%	CLAY 26.0%	D_{10}	UNIFIED CLASS CL	
ELEV.						

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 8/31/89
JOB NO: 70389



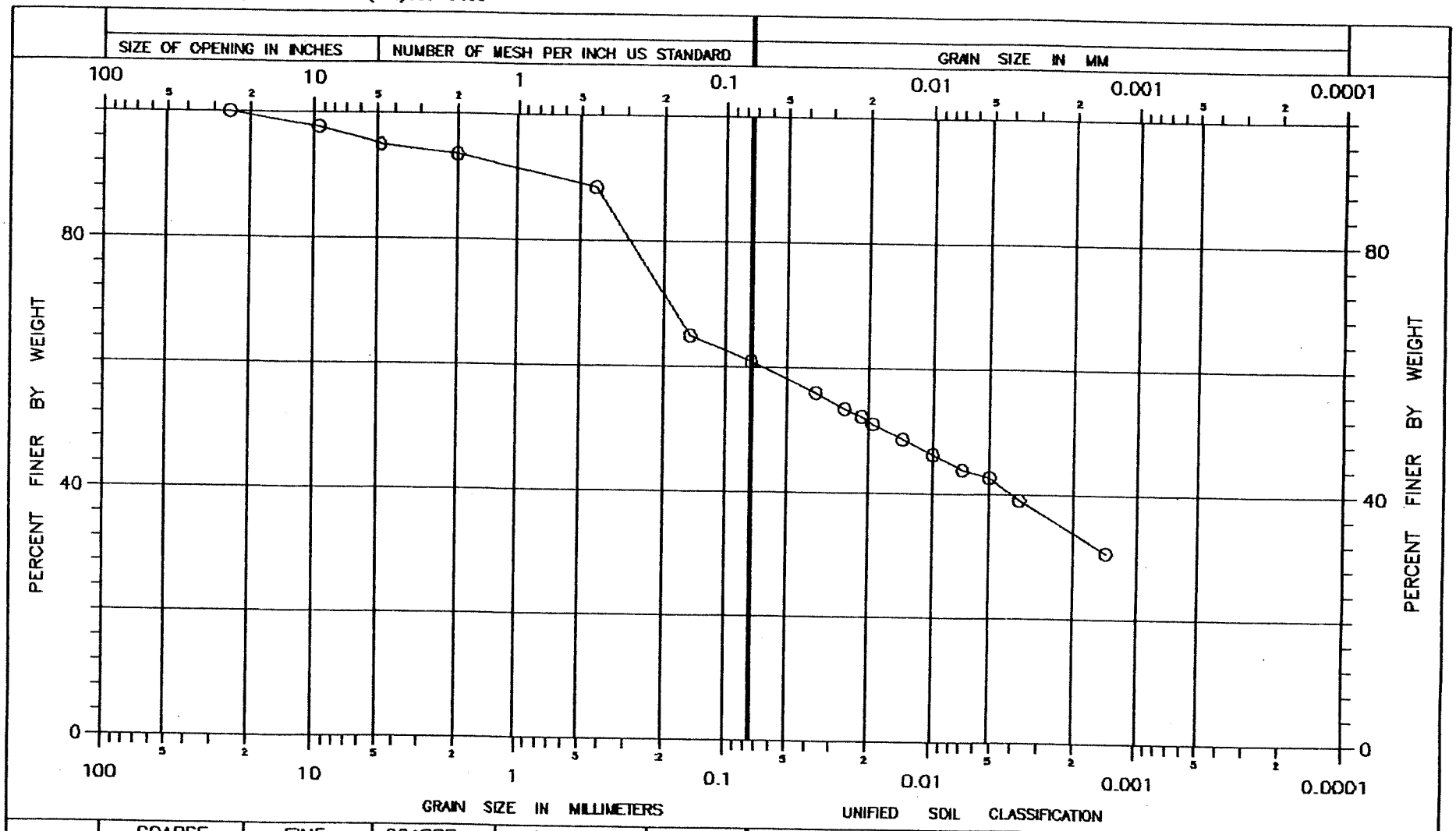
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY	COLLOIDS
	GRAVEL		SAND					

BORING NO.	Test Pit C	GRAVEL 0.0 %	F. SAND 1.0 %	D_{60}	C_u	○○○○○ MECHANICAL
SAMPLE NO.	S2-C	C. SAND 0.0 %	SILT 69.0 %	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH	5-6ft	M. SAND 0.0 %	CLAY 30.0%	D_{10}	UNIFIED CLASS CL	
ELEV.						

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/27/89
JOB NO: 70389



BORING NO. Test Pit C
SAMPLE NO. S3-C
DEPTH 7'-8'
ELEV.

GRAVEL 5.08%
C. SAND 1.41%
M. SAND 5.0%
F. SAND 27.6%
SILT 18.91%
CLAY 42.0%

D_{60}
D_{30}
D_{10}
C_u
C_z

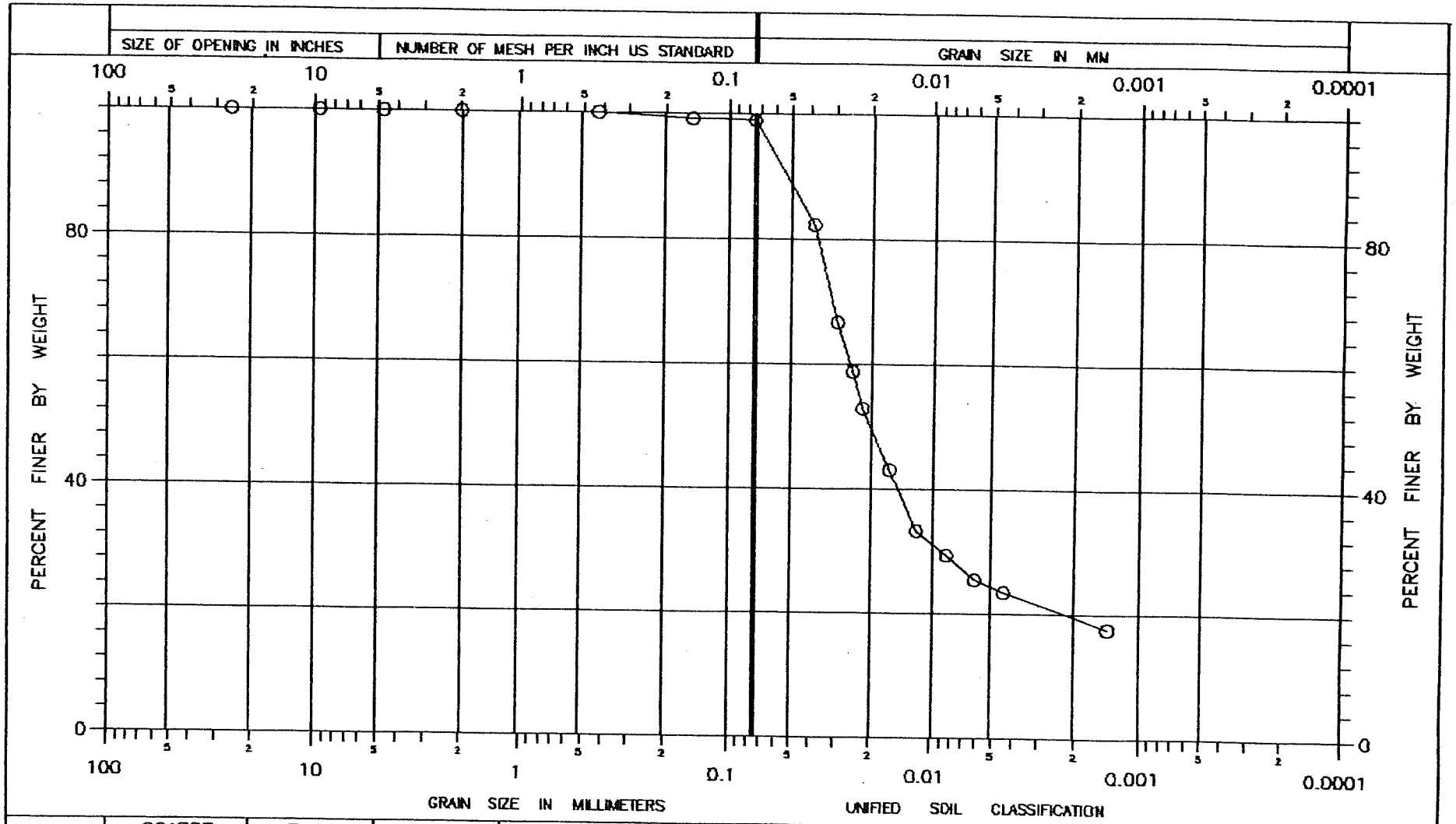
UNIFIED CLASS CL

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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/28/89
JOB NO: 70389



BORING NO.	Test Pit D	GRAVEL	0.0%	F. SAND	1.06%	D_{60}	C_u
SAMPLE NO.	S1-D	C. SAND	0.0%	SILT	74.94%	D_{30}	C_z
DEPTH	3'-4'	M. SAND	0.0%	CLAY	24.0%	D_{10}	UNIFIED CLASS CL
ELEV.							

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FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 70389

Sample No.: S2-12 (Proctor Case Test #1)

Sample Description: Clay

Sample Diameter: 5.4 cm

Sample Height (L): 6.8 cm

Sample Area (A): 22.89 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 107.43 pcf

Moisture Content (Initial): 15.89%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h^f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h° (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	64,800	193.1	192.8	1.26×10^{-8}
2	108,000	192.8	192.6	5.05×10^{-9}
3	86,400	192.6	192.1	1.58×10^{-8}
4	68,400	192.1	191.9	8.00×10^{-9}
		Ave. K_T =		1.03×10^{-8}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 70389

Sample No.: S2-12 (Proctor Case Test #2)

Sample Description: Clay

Sample Diameter: 5.8 cm

Sample Height (L): 7.2 cm

Sample Area (A): 26.40 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 109.74

Moisture Content (Initial): 18.64

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h^f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h^o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	72,000	187.5	186.4	3.94×10^{-8}
2	108,000	186.4	184.3	5.06×10^{-8}
3	86,400	184.3	184.0	9.10×10^{-9}
4	68,400	184.0	183.8	7.67×10^{-9}
		Ave. K_T =		2.66×10^{-8}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 70389

Sample No.: S2-12 (Proctor Case Test #3)

Sample Description: Clay

Sample Diameter: 5.7 cm

Sample Height (L): 7.3 cm

Sample Area (A): 25.5 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 104.65

Moisture Content (Initial): 22.71%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	72,000	194.8	194.5	1.08×10^{-8}
2	108,000	194.5	194.1	9.65×10^{-9}
3	86,400	194.1	193.9	6.04×10^{-9}
4	68,400	193.9	193.6	1.14×10^{-8}
		Ave. K_T =		9.47×10^{-9}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 70389

Sample No.: S2-12 (Proctor Case Test #4)

Sample Description: Clay

Sample Diameter: 5.7 cm

Sample Height (L): 7.2 cm

Sample Area (A): 25.5 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 100.24

Moisture Content (Initial): 24.8%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	72,000	193.1	193.0	3.59×10^{-9}
2	108,000	193.0	192.7	7.19×10^{-9}
3	86,400	192.7	192.4	9.01×10^{-9}
4	68,400	192.4	192.1	1.14×10^{-8}
			Ave. K_T =	7.79×10^{-9}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 703

Sample No.: S-8 Proctor Case Test No. 2

Sample Description: Clay

Sample Diameter: 5.9 cm

Sample Height (L): 7.0 cm

Sample Area (A): 27.33 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 116.92 pcf

Moisture Content (Initial): 12.38%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	90000	192.4	191.5	2.36×10^{-8}
2	83400	191.5	190.9	1.70×10^{-8}
3	85800	190.9	190.2	1.94×10^{-8}
4	86700	190.2	189.4	2.20×10^{-8}
5	261600	189.4	187.3	1.93×10^{-8}
6	89100	187.3	186.8	1.36×10^{-8}
7	86400	186.8	186.4	1.12×10^{-8}
8	102600	186.4	185.8	1.42×10^{-8}
9	86400	185.8	185.0	2.26×10^{-8}
			Ave. K_T	1.81×10^{-8}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 703

Sample No.: S-8 Proctor Case Test No. 3

Sample Description: Clay

Sample Diameter: 5.6 cm

Sample Height (L): 6.6 cm

Sample Area (A): 24.62 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 117.92 pcf

Moisture Content (Initial): 13.21%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h^f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h^o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	90000	192.0	191.5	1.37×10^{-8}
2	83400	191.5	191.3	5.94×10^{-9}
3	89800	191.3	190.8	1.44×10^{-8}
4	86700	190.8	190.5	8.61×10^{-9}
5	261600	190.5	189.5	9.54×10^{-9}
6	89100	189.5	189.4	2.81×10^{-9}
7	86400	189.4	189.1	8.70×10^{-9}
8	102600	189.1	188.8	7.34×10^{-9}
9	86400	188.8	188.4	1.16×10^{-8}
			Ave. K_T	9.18×10^{-9}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 703

Sample No.: S-8 Proctor Case Test No. 4

Sample Description: Clay

Sample Diameter: 5.8 cm

Sample Height (L): 7.0 cm

Sample Area (A): 26.41 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 114.13 pcf

Moisture Content (Initial): 17.23%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	90000	196.6	196.0	1.59×10^{-8}
2	83400	196.0	195.4	1.72×10^{-8}
3	85800	195.4	194.7	1.96×10^{-8}
4	86700	194.7	194.0	1.11×10^{-8}
5	261600	194.0	192.8	1.11×10^{-8}
6	89100	192.8	192.4	1.09×10^{-8}
7	86400	192.4	191.9	1.41×10^{-8}
8	102600	191.9	191.4	1.19×10^{-8}
9	86400	191.4	190.8	1.70×10^{-8}
			Ave. K_T	1.52×10^{-8}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 703

Sample No.: S-8 Proctor Case Test No. 5

Sample Description: Clay

Sample Diameter: 5.7 cm

Sample Height (L): 6.5 cm

Sample Area (A): 25.5 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 101.54 pcf

Moisture Content (Initial): 22.91%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	90000	195.9	191.1	1.24×10^{-7}
2	83400	191.1	187.8	9.42×10^{-8}
3	85800	187.8	185.1	7.61×10^{-8}
4	86700	185.1	182.2	8.21×10^{-8}
5	261600	182.2	174.0	7.94×10^{-8}
6	89100	174.0	171.4	7.62×10^{-8}
7	86400	171.4	168.8	7.98×10^{-8}
8	102600	168.8	166.0	7.35×10^{-8}
9	86400	166.0	163.4	8.24×10^{-8}
			Ave. K_T	8.53×10^{-8}

Central Wisconsin
Engineers

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COMPACTION TEST

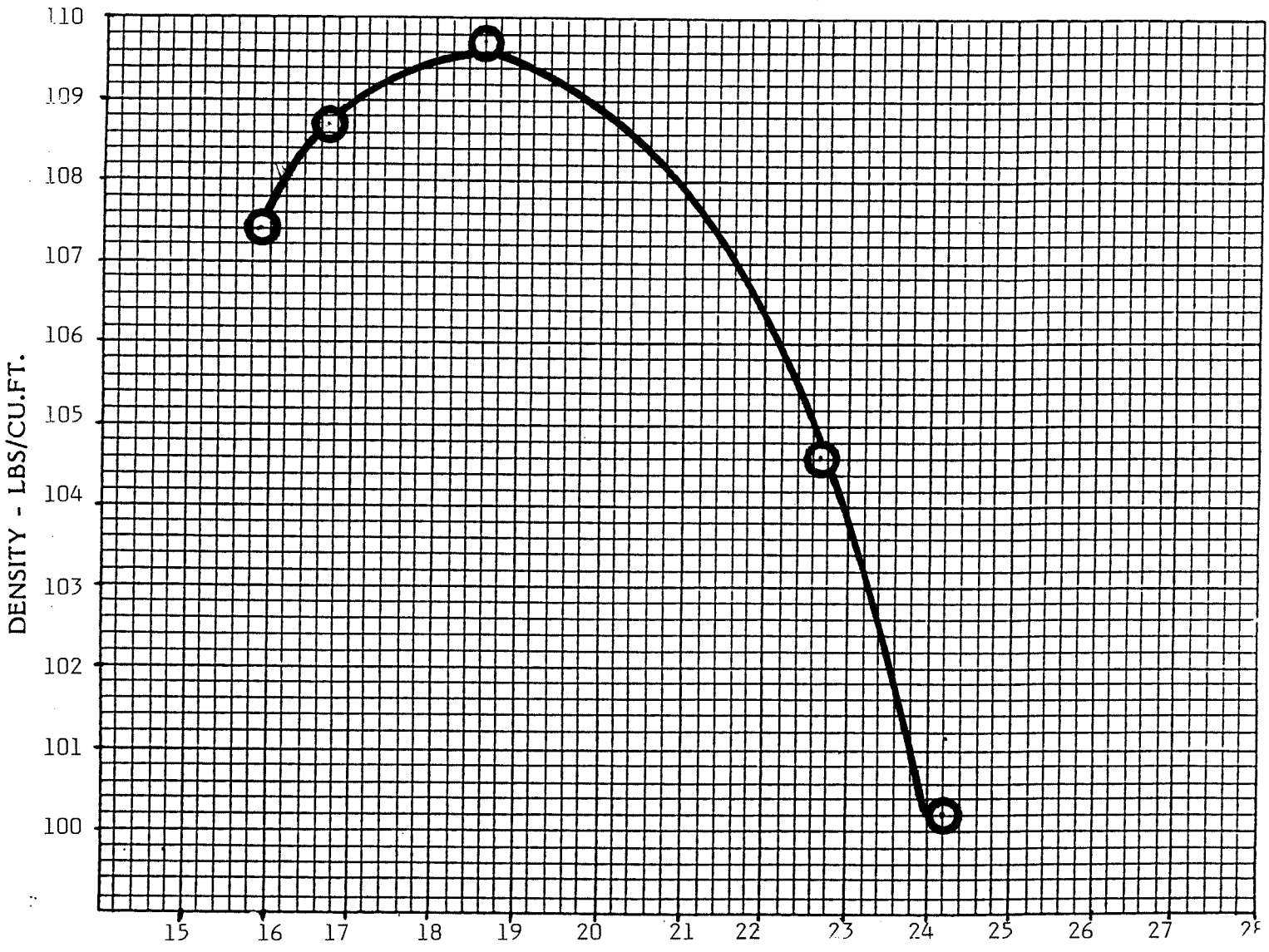
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM Vernon County Clay Search TEST NO. S-5

SAMPLE DESCRIPTION Clay SAMPLE NO. S2-12

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 109.7 LBS./CU.FT. OPTIMUM MOISTURE 18.6 %

REMARKS

TESTED BY K. Y. DATE Oct. 5 19 89

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COMPACTION TEST

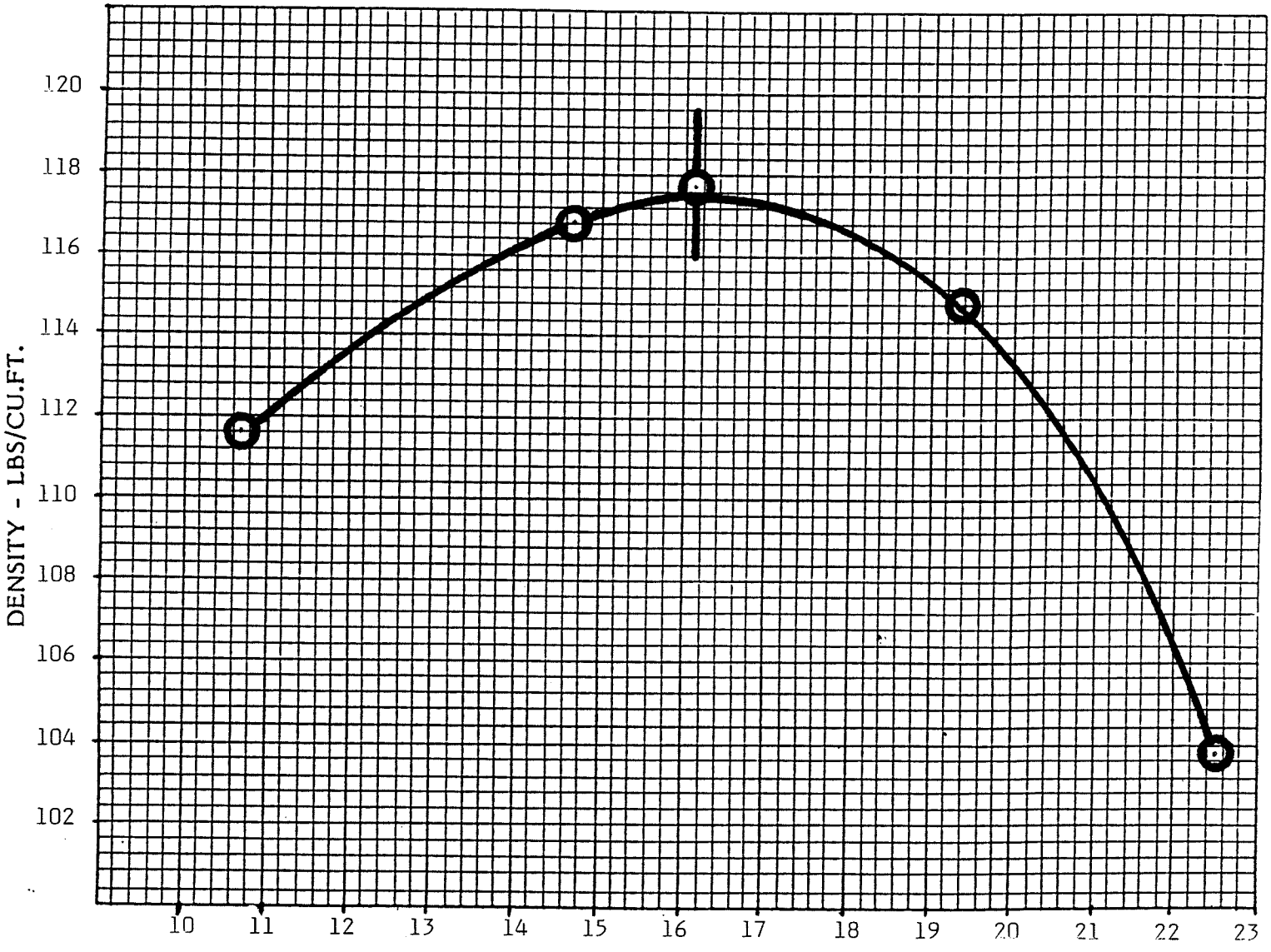
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM Vernon County Clay Search TEST NO. S-2

SAMPLE DESCRIPTION Clay SAMPLE NO. S4-8

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 117.9 LBS./CU.FT. OPTIMUM MOISTURE 16.1 %

REMARKS

TESTED BY K. Y. DATE Oct. 9 19 89

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Engineers

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COMPACTION TEST

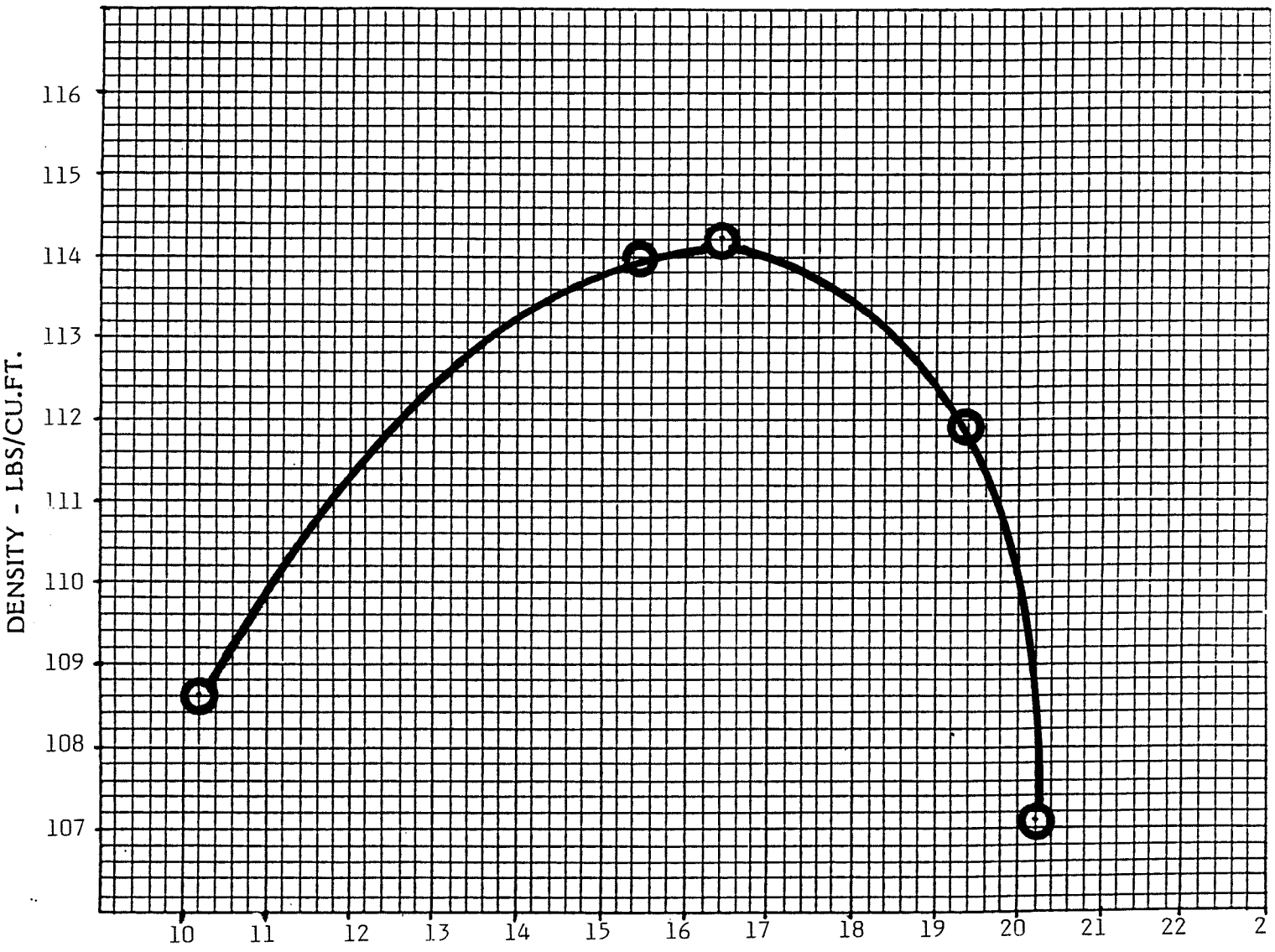
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM Vernon County Clay Search TEST NO. S-3

SAMPLE DESCRIPTION Clay SAMPLE NO. S4-13

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 114.2 LBS./CU.FT. OPTIMUM MOISTURE 16.4 %

REMARKS

TESTED BY K. Y. DATE Oct. 9 19 89

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COMPACTION TEST

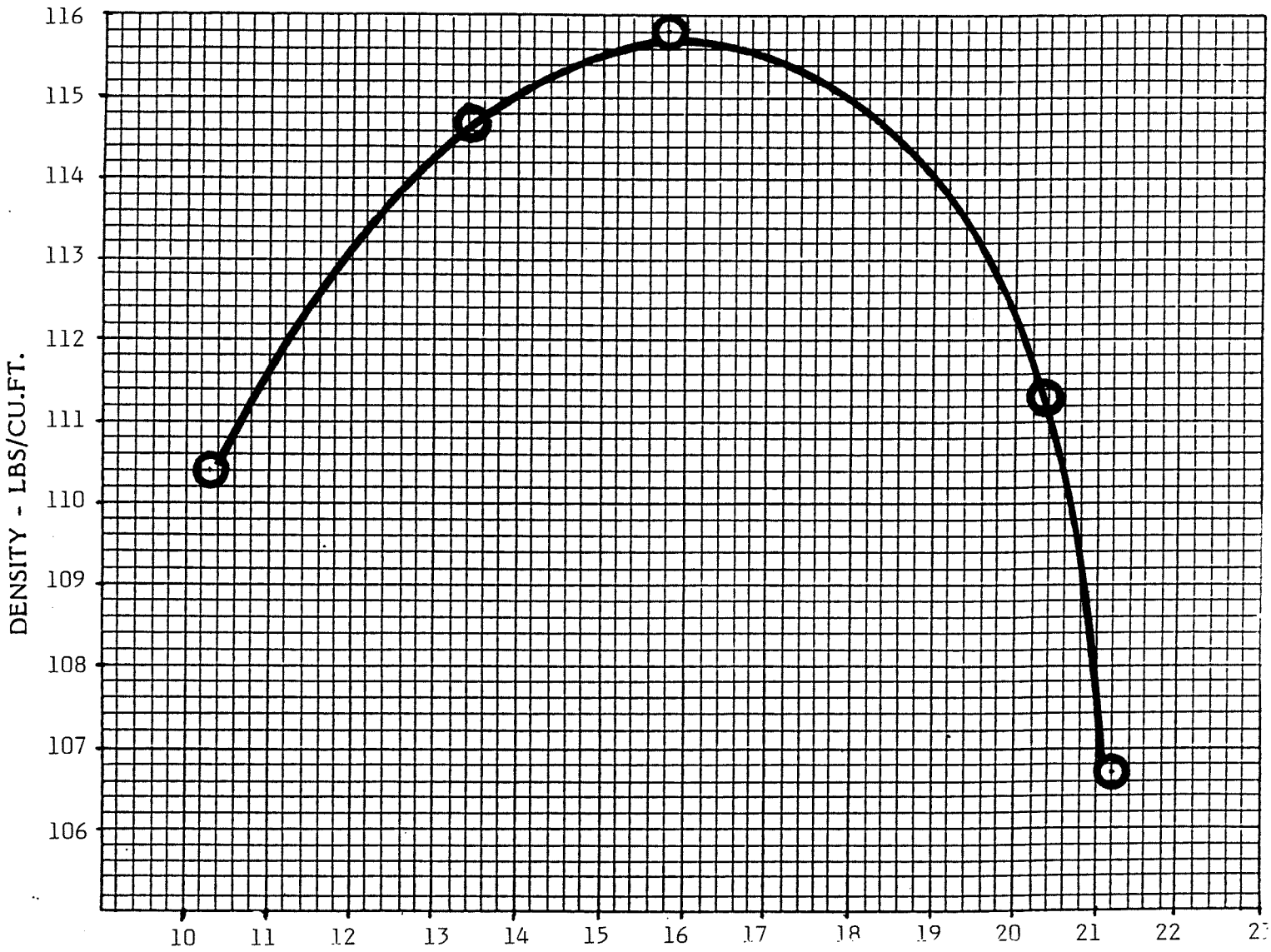
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM Vernon County Clay Search TEST NO. S-4

SAMPLE DESCRIPTION Clay SAMPLE NO. S4-15

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 115.8 LBS./CU.FT. OPTIMUM MOISTURE 15.8 %

REMARKS

TESTED BY K. Y. DATE Oct. 8 19 89

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COMPACTION TEST

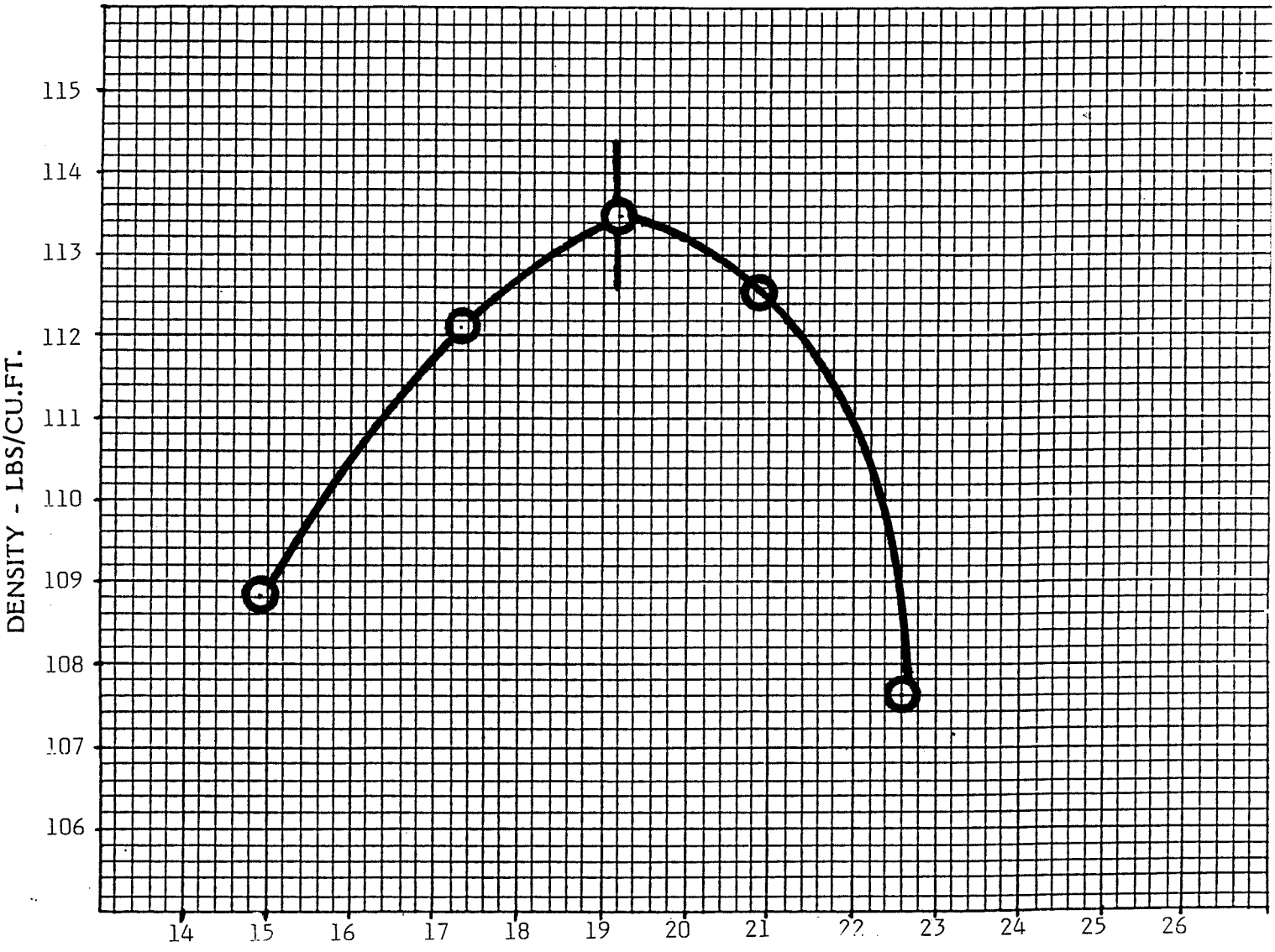
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM Vernon County Clay Search TEST NO. S-1

SAMPLE DESCRIPTION Clay SAMPLE NO. S4-23

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 113.5 LBS./CU.FT. OPTIMUM MOISTURE 19.2 %

REMARKS

TESTED BY K. Y. DATE Oct. 8 19 89

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COMPACTION TEST

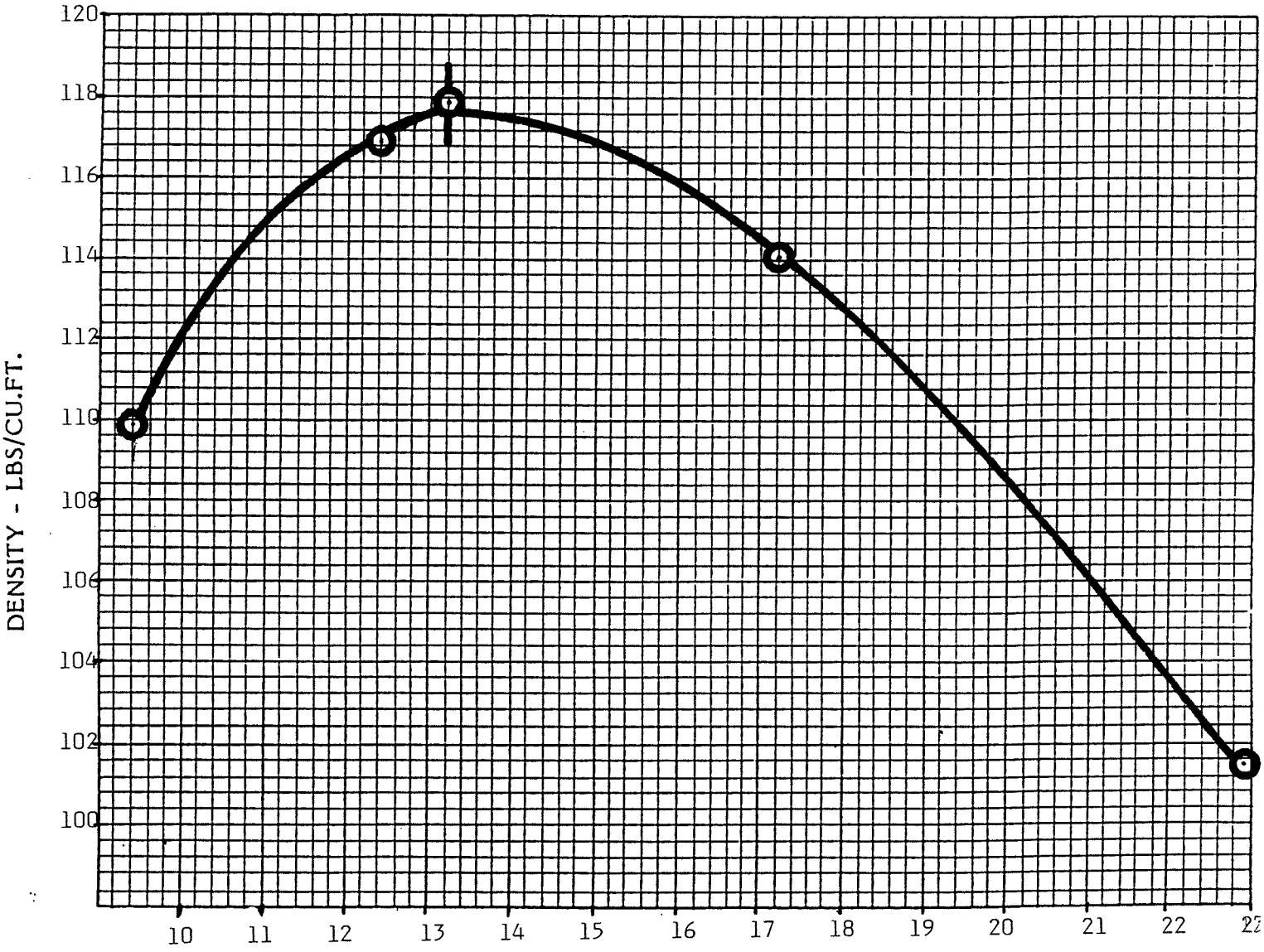
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM _____ TEST NO. 8

SAMPLE DESCRIPTION Clay SAMPLE NO. S-8

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 117.92 LBS./CU.FT. OPTIMUM MOISTURE 13.21 %

REMARKS _____

TESTED BY K.Y. DATE Jan. 9 19 90

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COMPACTION TEST

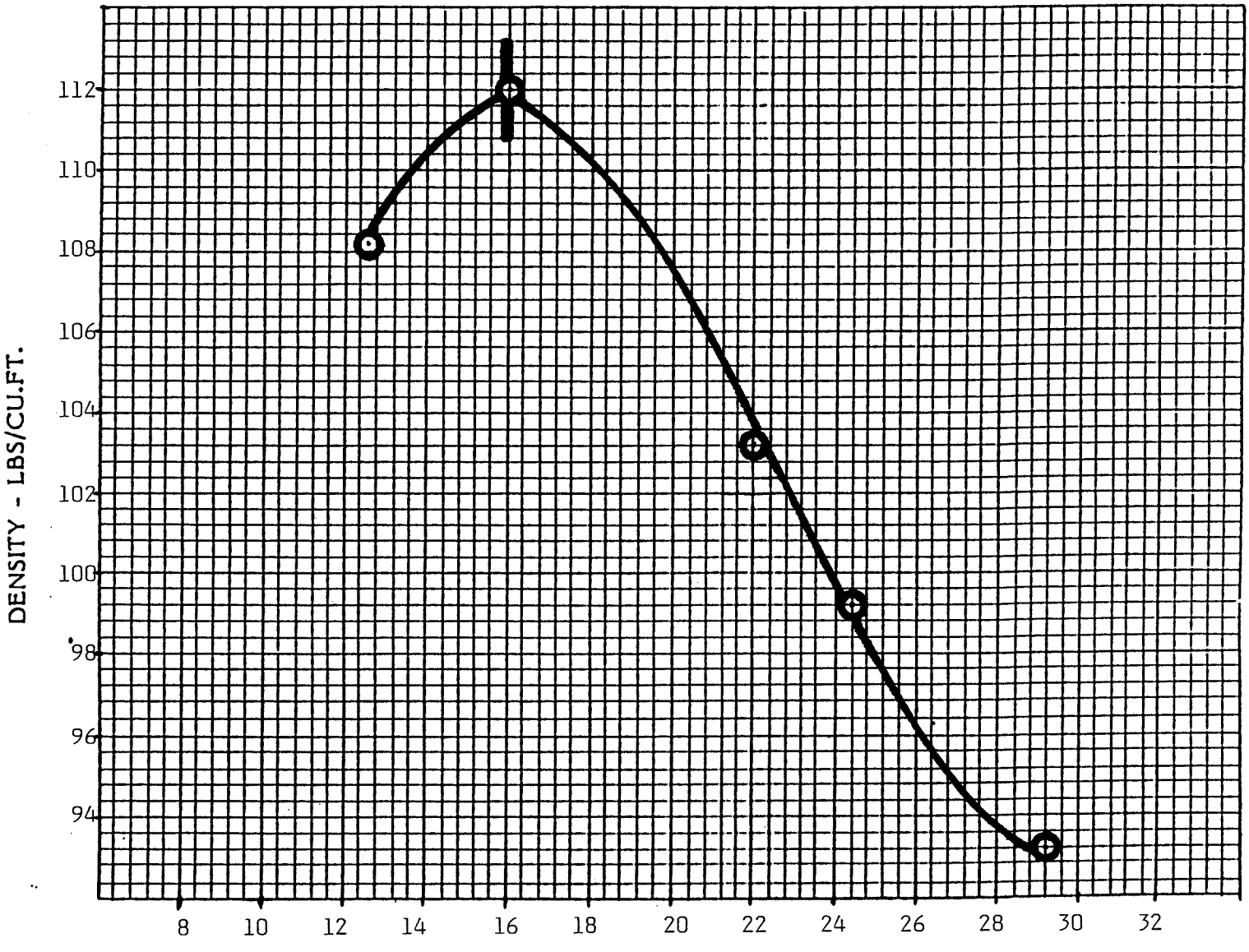
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM _____ TEST NO. 7

SAMPLE DESCRIPTION Clay SAMPLE NO. S-7

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 111.99 LBS./CU.FT. OPTIMUM MOISTURE 15.99 %

REMARKS _____

TESTED BY K.Y. DATE Jan. 4 1990

Central Wisconsin
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COMPACTION TEST

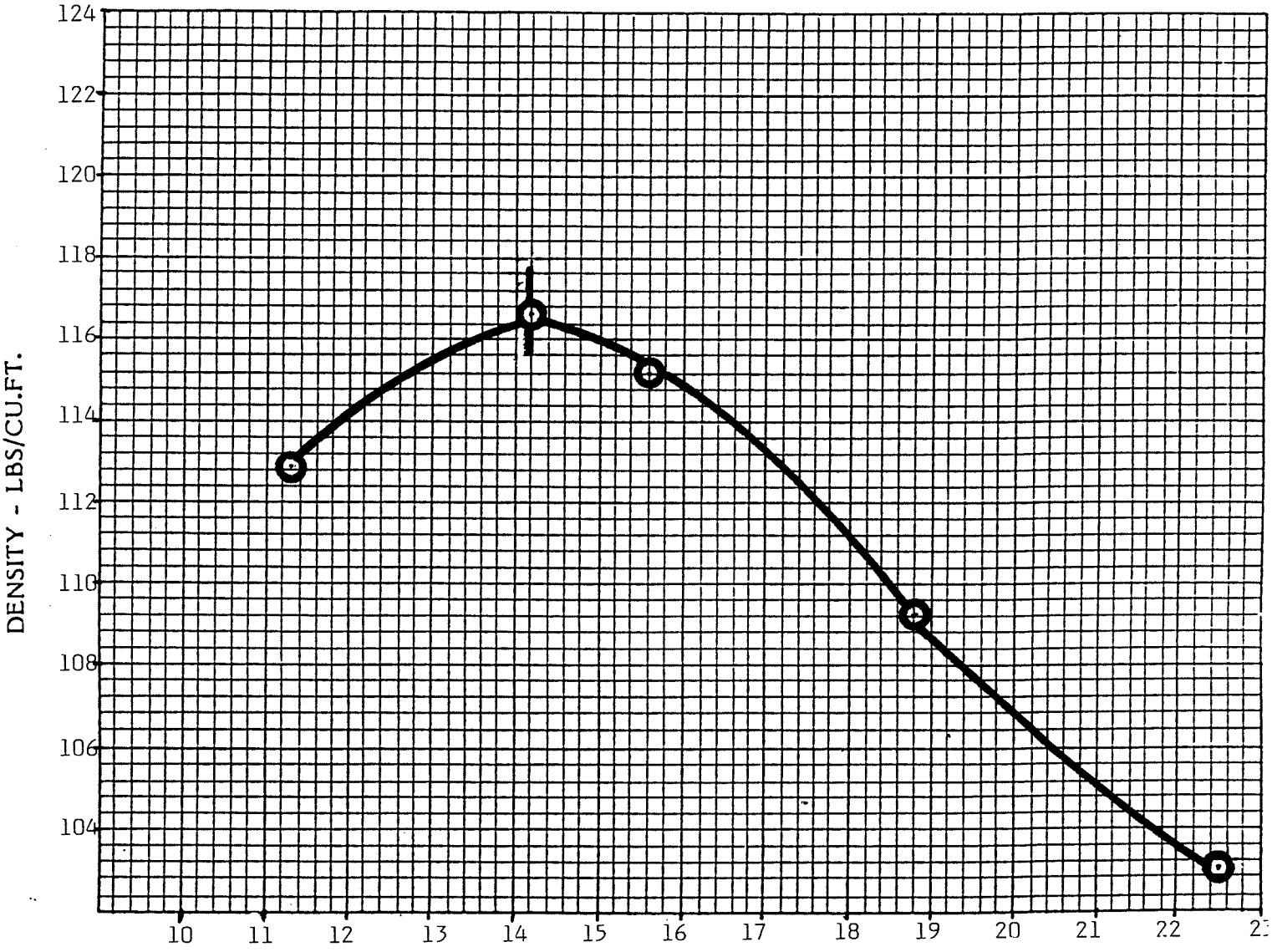
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM _____ TEST NO. 6

SAMPLE DESCRIPTION Clay SAMPLE NO. S-6

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 116.64 LBS./CU.FT. OPTIMUM MOISTURE 14.20 %

REMARKS _____

TESTED BY K.Y. DATE Jan 4 19 90

Central Wisconsin
Engineers
P.O. Box 107 * Weston, WI 54476 * (715) 359-9400

FINAL TEST INFORMATION

Project: Vernon County Landfill Balefill

Job No. 946-02-000

Date: 8/20/03

By: Ka Yang

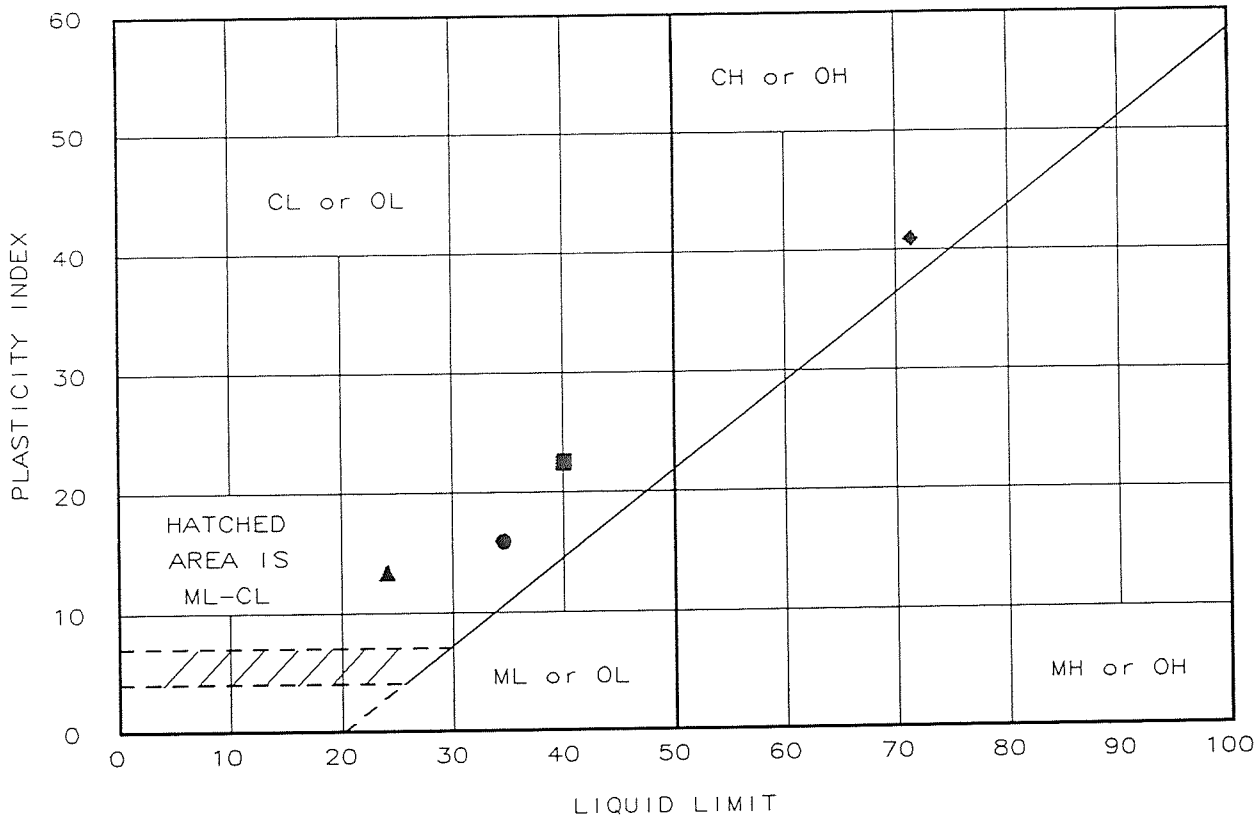
Sample No.	Boring No.	Sample Depth	% Clay	% Silt	Gradation - % Passing 200	100	#40	#10	#4	3/8"	3/4"	1"	2"	LL	PI	USCS	W %	OPT. M%	Max. DD	k -(CM/S)
S-1	MW-1RZ	3'-6'	22.6	75.3	97.9	98.5	99.7	100.0						34.6	15.9	CL				
S-2	MW-1RZ	13'-15'	14.4	19.4	33.9	42.6	94.3	98.6	98.9	100.0				24.1	13.4	SC				
S-3	MW-1RZ	15'-20'	--	--	22.6	34.7	93.4	100.0						--	--	SM				
S-4	MW-1RZ	33'-34'	--	--	21.8	28.3	64.6	84.0	89.8	96.6	100.0			--	--	SM				
S-5	MW-1RZ	49'-50'	18.0	17.3	35.2	40.3	83.4	91.7	93.1	95.1	100.0			40.1	22.5	SC				
S-6	MW-1RZ	58'-60'	9.1	10.6	19.7	22.0	27.1	39.0	50.4	63.6	74.2	76.2	100.0	--	--	GM				
S-7	MW-1RZ	71'-73'	27.4	32.9	60.3	62.3	72.9	79.3	86.6	95.8	100.0			71.3	40.9	CH				
S-8	MW-1RZ	76'-78'	--	--	46.3	66.0	94.3	96.9	97.7	97.9	100.0			--	--	SM				
S-9	MW-1RZ	86'-88'	--	--	11.3	22.3	94.1	98.4	99.1	100.0				--	--	SP-SM				
S-10	MW-1RZ	88'-90'	--	--	11.2	17.4	27.8	29.4	32.3	37.8	46.1	59.1	100.0	--	--	SP-SM				
S-1	MW-14Z	48'-50'	56.0	39.7	95.7	97.1	97.8	98.8	99.1	99.5	100.0			91.2	55.0	CH				
S-2	MW-14Z	66'	21.4	48.1	69.5	78.4	92.6	97.8	99.4	100.0				32.4	15.9	CL				
S-3	MW-14Z	76'-78	--	--	20.7	40.7	81.2	85.2	87.5	90.2	100.0			--	--	SM				

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COPY

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-90
●	MW 1RZ S-1 3'- 6' Yellowish light brown lean clay	34.6	18.7	15.9	97.9	CL, Lean clay
▲	MW 1RZ S-2 13'- 15' Reddish-yellowish clayey sand w/gravel	24.1	10.7	13.4	33.9	SC, Clayey sand
■	MW 1RZ S-5 49'- 50' Reddish-yellowish brown clayey sand w/gravel	40.1	17.6	22.5	35.2	SC, Clayey sand
◆	MW 1RZ S-7 71'- 73' Brown fat clay w/sand	71.3	30.4	40.9	60.3	CH, Sandy fat clay

Project No.: 946-02-000
Project: Vernon County Landfill Balefill

Client: Vernon County Landfill
Location:

Date: 8/18/03

LIQUID AND PLASTIC LIMITS TEST REPORT

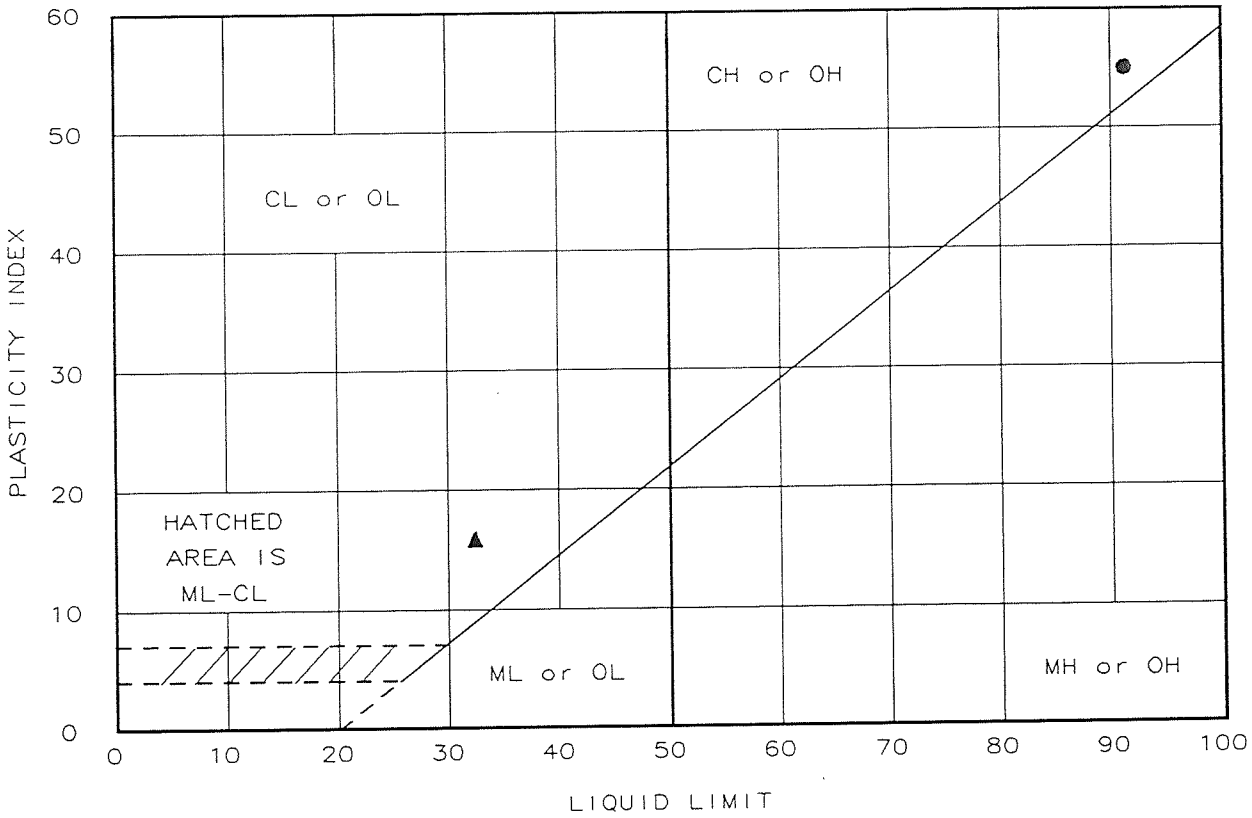
CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Fig. No. 1

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-90
●	MW 14Z S-1 48'- 50' Brown fat clay w/sand	91.2	36.2	55	95.7	CH, Fat clay
▲	MW 14Z S-2 66' Brown sandy lean clay	32.4	16.5	15.9	69.5	CL, Sandy lean clay

Project No.: 946-02-000
Project: Vernon County Landfill Balefill

Client: Vernon County Landfill
Location:

Date: 8/18/03

LIQUID AND PLASTIC LIMITS TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Fig. No. 2

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 5

Date: 4/23/03
Project No.: 946-02-000
Project: Vernon County landfill Balefill

Sample Data

Location of Sample: S-1 MW 1RZ 3'- 6'
Sample Description: Yellowish light brown lean clay
USCS Class: CL Liquid limit: 34.6
AASHTO Class: Plasticity index: 15.9

Notes

Remarks: Monitoring wells

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	403.10	80.90
Tare =	74.30	74.30
Dry sample weight =	328.80	6.60
Minus #200 from wash=	98.0 %	

Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
# 4	0.00	0.00	100.0
# 10	0.10	0.00	100.0
# 40	1.00	0.00	99.7
# 100	3.80	0.00	98.5
# 200	1.90	0.00	97.9

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 97.9
Weight of hydrometer sample: 50
Calculated biased weight= 51.06
Automatic temperature correction
Composite correction at 20 deg C =-6

Meniscus correction only= 1
Specific gravity of solids= 2.72
Specific gravity correction factor= 0.985
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

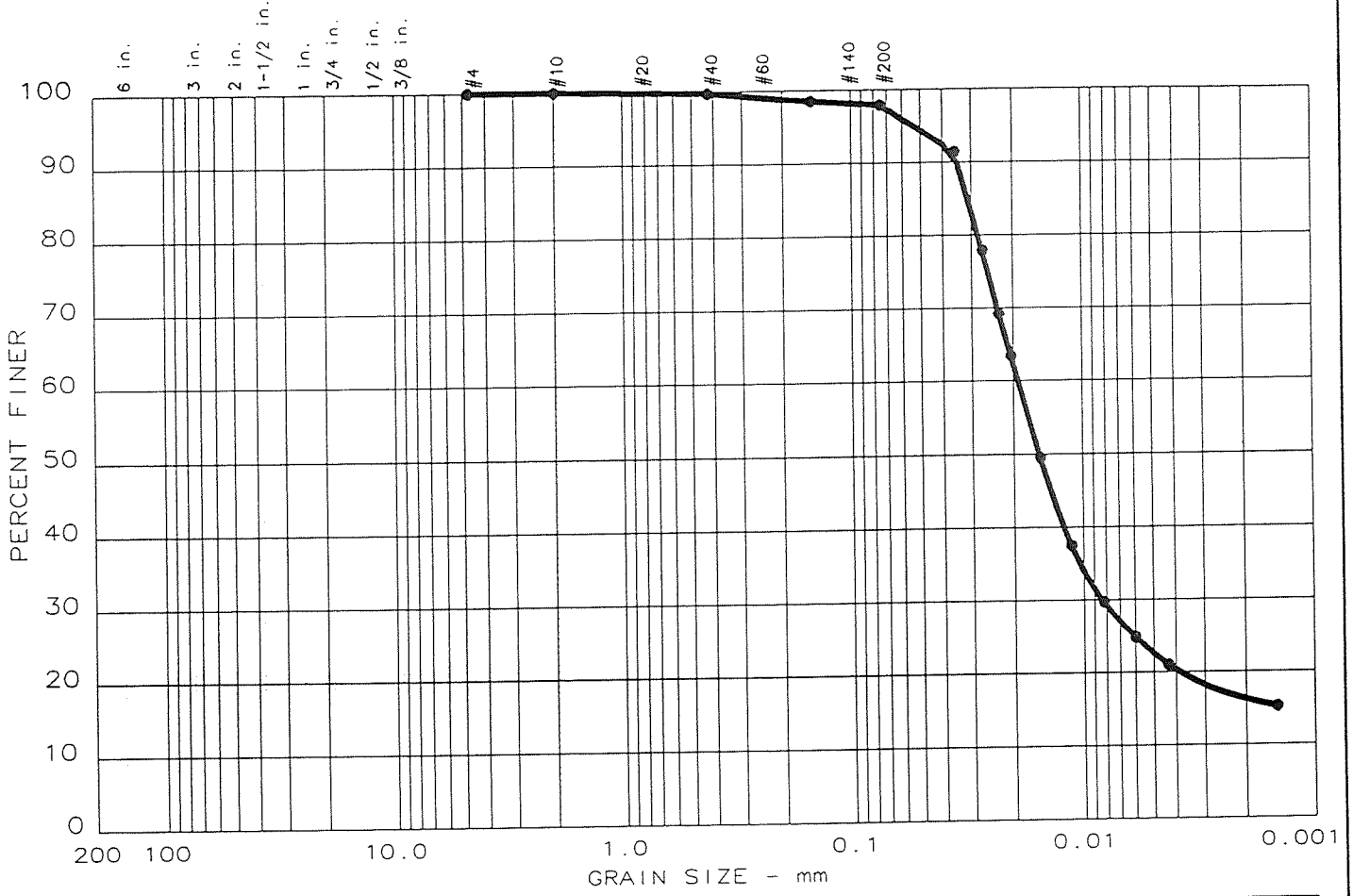
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	22.0	53.0	47.4	0.0130	54.0	7.4	0.0356	91.4
2.0	22.0	46.0	40.4	0.0130	47.0	8.6	0.0270	77.9
3.0	22.0	41.5	35.9	0.0130	42.5	9.3	0.0230	69.3
4.0	22.0	38.5	32.9	0.0130	39.5	9.8	0.0204	63.5
8.0	22.0	31.3	25.7	0.0130	32.3	11.0	0.0153	49.5
16.0	22.0	25.0	19.4	0.0130	26.0	12.0	0.0113	37.4
32.0	22.0	21.0	15.4	0.0130	22.0	12.7	0.0082	29.7
62.0	22.0	18.5	12.9	0.0130	19.5	13.1	0.0060	24.9
122.0	22.0	16.5	10.9	0.0130	17.5	13.4	0.0043	21.0
1101.0	22.0	13.5	7.9	0.0130	14.5	13.9	0.0015	15.3

Fractional Components

avel/Sand based on #4 sieve
and/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 2.1
SILT = 75.3 % CLAY = 22.6

85= 0.03 D60= 0.019 D50= 0.015
0= 0.0083

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.0	2.1	75.3	22.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	34.6	15.9			0.0155	0.0083				

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellowish light brown lean clay	CL	

Project No.: 946-02-000
Project: Vernon County landfill Balefill
● Location: S-1 MW 1RZ 3'- 6'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA

Test No.: 6

ate: 4/23/03
roject No.: 946-02-000
oject: Vernon County landfill Balefill

Sample Data

ocation of Sample: S-2 MW 1RZ 13'- 15'
mple Description: Reddish-yellowish clayey sand
CS Class: SC
ASHTO Class:
Liquid limit: 24.1
Plasticity index: 13.4

Notes

marks: Monitoring wells

g. No.: 2

Mechanical Analysis Data

	Initial	After wash
y sample and tare=	532.80	387.80
re =	74.00	74.00
ry sample weight =	458.80	313.80

inus #200 from wash= 31.6 %
eve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.375 inches	0.00	0.00	100.0
# 4	4.90	0.00	98.9
# 10	1.60	0.00	98.6
# 40	19.50	0.00	94.3
# 100	247.40	10.00	42.6
# 200	40.00	0.00	33.9

Hydrometer Analysis Data

eparation sieve is number 200
rcent -#200 based on complete sample= 33.9
ight of hydrometer sample: 50
alculated biased weight= 147.62
tomatic temperature correction
Composite correction at 20 deg C =-6

eniscus correction only= 1
ecific gravity of solids= 2.68
ecific gravity correction factor= 0.993
ydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

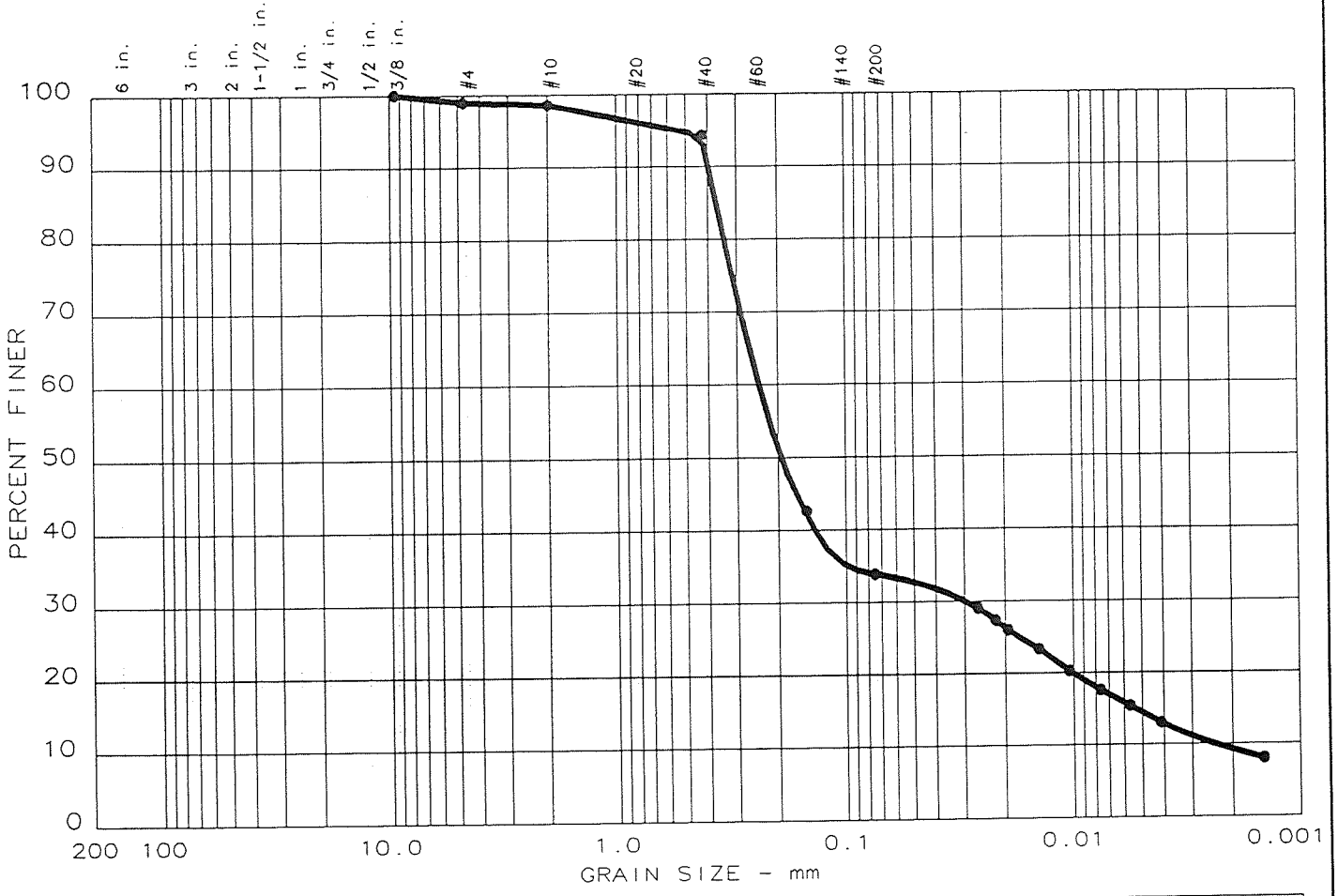
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.0	23.0	48.5	43.2	0.0130	49.5	8.2	0.0264	29.0
3.0	23.0	46.0	40.7	0.0130	47.0	8.6	0.0221	27.4
4.0	23.0	44.0	38.7	0.0130	45.0	8.9	0.0195	26.0
8.0	23.0	40.0	34.7	0.0130	41.0	9.6	0.0143	23.3
16.0	23.0	35.5	30.2	0.0130	36.5	10.3	0.0105	20.3
32.0	23.0	31.5	26.2	0.0130	32.5	11.0	0.0076	17.6
62.0	22.0	28.5	22.9	0.0132	29.5	11.5	0.0057	15.4
122.0	22.0	25.0	19.4	0.0132	26.0	12.0	0.0041	13.1
1092.0	22.0	17.5	11.9	0.0132	18.5	13.3	0.0015	8.0

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 1.1 % SAND = 65.1
% SILT = 19.4 % CLAY = 14.4

D85= 0.37 D60= 0.240 D50= 0.193
D30= 0.0295 D15= 0.00531 D10= 0.00232
Cc = 1.5668 Cu = 103.5142

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3''	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	1.1	65.1	19.4	14.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	24.1	13.4	0.367	0.240	0.193	0.0295	0.0053	0.0023	1.57	103.5

MATERIAL DESCRIPTION	USCS	AASHTO
● Reddish-yellowish clayey sand	SC	

Project No.: 946-02-000
Project: Vernon County landfill Balefill
● Location: S-2 MW 1RZ 13'- 15'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 2

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 7

Date: 4/23/03
Project No.: 946-02-000
roject: Vernon County landfill Balefill

Sample Data

ocation of Sample: S-3 MW 1RZ 15'- 20'
ample Description: Reddish-yellowish m-f sand w/fines
USCS Class: SM Liquid limit:
AASHTO Class: Plasticity index:

Notes

emarks: Monitoring wells

Fig. No.: 3

Mechanical Analysis Data

	Initial	After wash
ry sample and tare=	599.80	481.30
are =	74.30	74.30
Dry sample weight =	525.50	407.00

inus #200 from wash= 22.5 %
ieve tare method

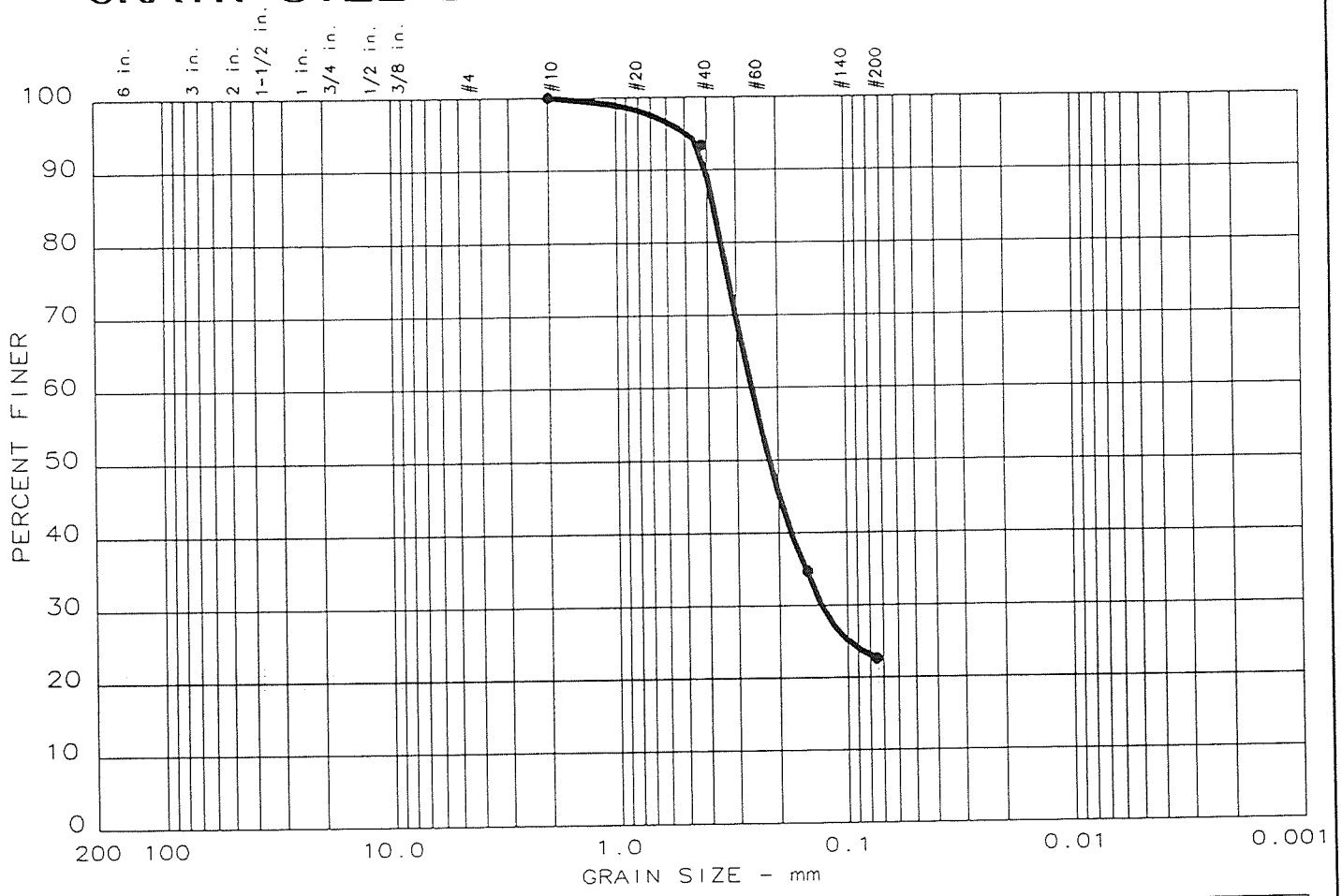
Sieve	Weight retained	Sieve tare	Percent finer
# 10	0.00	0.00	100.0
# 40	34.70	0.00	93.4
# 100	308.60	0.00	34.7
# 200	63.30	0.00	22.6

Fractional Components

ravel/Sand based on #4 sieve
and/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 77.4
FINES = 22.6

D85= 0.38 D60= 0.259 D50= 0.218
D30= 0.1296

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.0	77.4	22.6	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.376	0.259	0.218	0.130				

MATERIAL DESCRIPTION	USCS	AASHTO
● Reddish-yellowish m-f sand w/fines	SM	

Project No.: 946-02-000

Project: Vernon County landfill Balefill

● Location: S-3 MW 1RZ 15'- 20'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 3

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 8

Date: 4/23/03
Project No.: 946-02-000
Project: Vernon County landfill Balefill

Sample Data

Location of Sample: S-4 MW 1RZ 33'- 34'
Sample Description: Reddish-yellowish brown c-f sand w/fines
USCS Class: SM Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks: Monitoring wells

Fig. No.: 4

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	509.50	415.90
Tare =	74.80	74.80
Dry sample weight =	434.70	341.10

Minus #200 from wash= 21.5 %

Sieve tare method

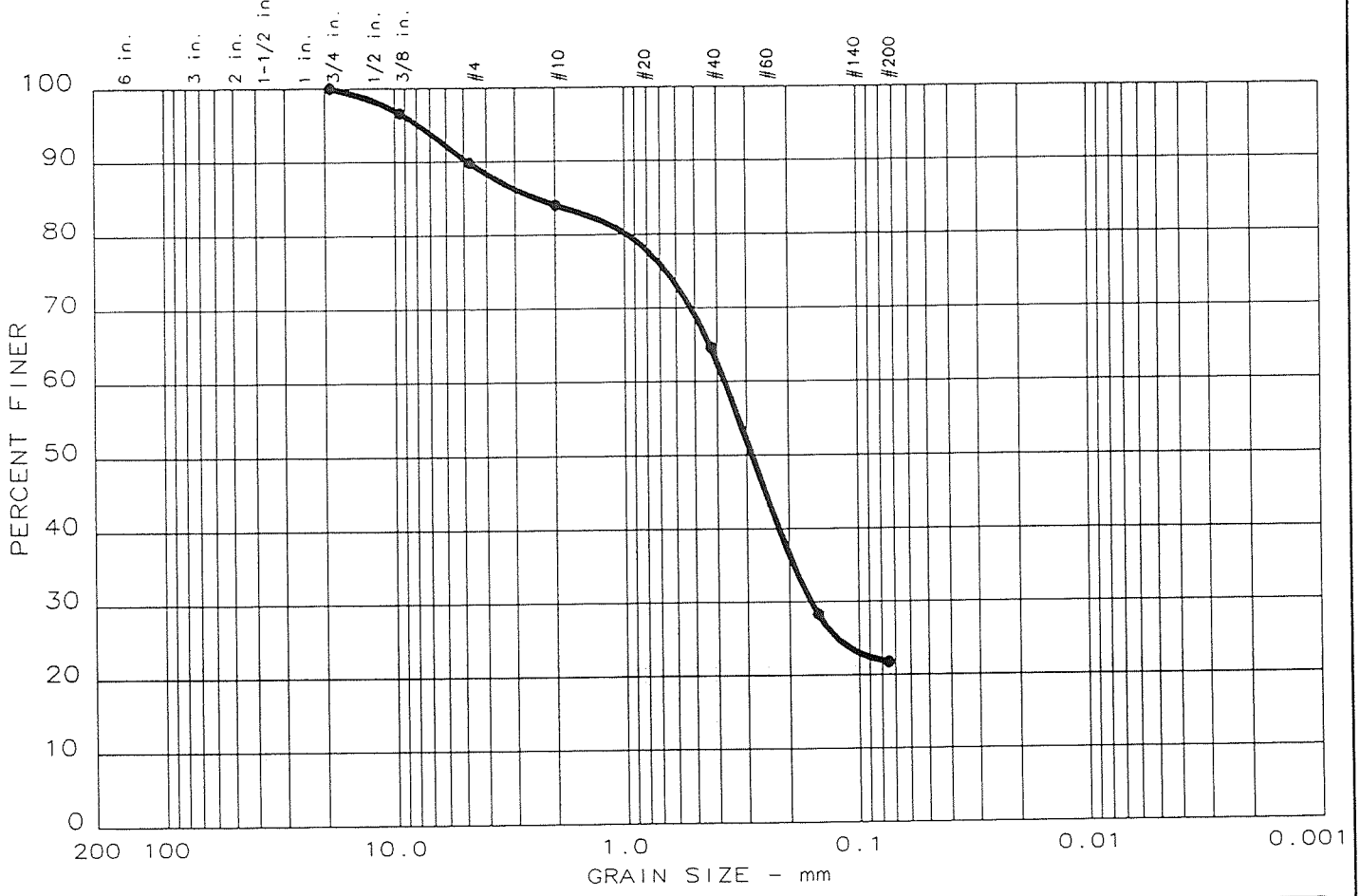
Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	14.70	0.00	96.6
# 4	29.60	0.00	89.8
# 10	25.20	0.00	84.0
# 40	84.50	0.00	64.6
# 100	157.80	0.00	28.3
# 200	28.30	0.00	21.8

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 10.2 % SAND = 68.0
% FINES = 21.8

D85= 2.37 D60= 0.371 D50= 0.284
D30= 0.1600

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	10.2	68.0	21.8	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			2.37	0.371	0.284	0.160				

MATERIAL DESCRIPTION	USCS	AASHTO
● Reddish-yellowish brown c-f sand w/fines	SM	

Project No.: 946-02-000
Project: Vernon County landfill Balefill
● Location: S-4 MW 1RZ 33'- 34'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 4

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 9

Date: 4/23/03
Project No.: 946-02-000
oject: Vernon County landfill Balefill

Sample Data

cation of Sample: S-5 MW 1RZ 49'- 50'
mple Description: Yellowish reddish brown clayey sand
USCS Class: SC Liquid limit:
AASHTO Class: Plasticity index:

Notes

marks: Monitoring wells

Fig. No.: 5

Mechanical Analysis Data

	Initial	After wash
y sample and tare=	424.60	302.30
re =	74.80	74.80
Dry sample weight =	349.80	227.50

nus #200 from wash= 35.0 %
eve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	17.10	0.00	95.1
# 4	7.10	0.00	93.1
# 10	4.80	0.00	91.7
# 40	29.20	0.00	83.4
# 100	150.60	0.00	40.3
# 200	17.70	0.00	35.2

Hydrometer Analysis Data

paration sieve is number 200
rcent -#200 based on complete sample= 35.2
Weight of hydrometer sample: 50
lculated biased weight= 141.85
tomatic temperature correction
Composite correction at 20 deg C =-6

niscus correction only= 1
Specific gravity of solids= 2.68
Specific gravity correction factor= 0.993
drometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

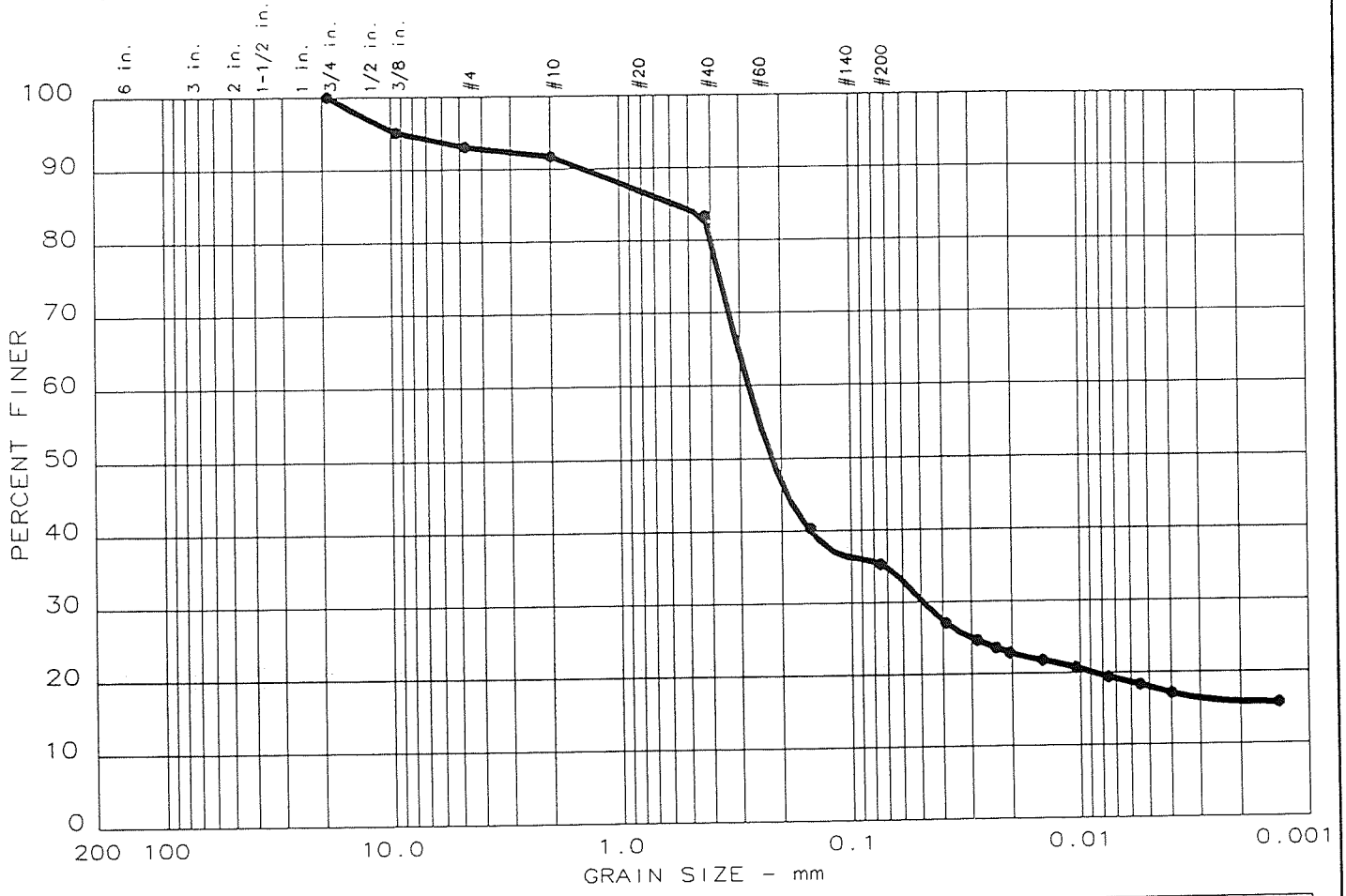
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.0	44.0	38.7	0.0130	45.0	8.9	0.0389	27.1
2.0	23.0	40.5	35.2	0.0130	41.5	9.5	0.0284	24.6
3.0	23.0	39.0	33.7	0.0130	40.0	9.7	0.0235	23.6
4.0	23.0	38.0	32.7	0.0130	39.0	9.9	0.0205	22.9
8.0	23.0	36.5	31.2	0.0130	37.5	10.1	0.0147	21.8
16.0	23.0	35.0	29.7	0.0130	36.0	10.4	0.0105	20.8
32.0	23.0	33.0	27.7	0.0130	34.0	10.7	0.0075	19.4
62.0	23.0	31.5	26.2	0.0130	32.5	11.0	0.0055	18.3
122.0	22.0	30.0	24.4	0.0132	31.0	11.2	0.0040	17.1
1083.0	22.0	28.0	22.4	0.0132	29.0	11.5	0.0014	15.7

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 6.9 % SAND = 57.8
SILT = 17.3 % CLAY = 18.0

D95= 0.56 D60= 0.275 D50= 0.218
D30= 0.0483

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	6.9	57.8	17.3	18.0

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.562	0.275	0.218	0.0483				

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellowish reddish brown clayey sand	SC	

Project No.: 946-02-000
Project: Vernon County landfill Balefill
● Location: S-5 MW 1RZ 49'- 50'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 5

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 10

Date: 4/23/03
Project No.: 946-02-000
Project: Vernon County landfill Balefill

Sample Data

Location of Sample: S-6 MW 1RZ 58'- 60'
Sample Description: Yellowish brown clayey-sandy gravel
USCS Class: GM Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks: Monitoring wells

Fig. No.: 6

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	480.90	400.70
Tare =	74.20	74.20
Dry sample weight =	406.70	326.50

Minus #200 from wash= 19.7 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
1.5 inches	0.00	0.00	100.0
1 inches	96.90	0.00	76.2
0.75 inches	8.10	0.00	74.2
0.375 inches	43.10	0.00	63.6
# 4	53.50	0.00	50.4
# 10	46.60	0.00	39.0
# 40	48.20	0.00	27.1
# 100	21.00	0.00	22.0
# 200	9.20	0.00	19.7

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 19.7
Weight of hydrometer sample: 50
Calculated biased weight= 253.87
Automatic temperature correction
Composite correction at 20 deg C =-6

Meniscus correction only= 1
Specific gravity of solids= 2.68

Specific gravity correction factor= 0.993
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

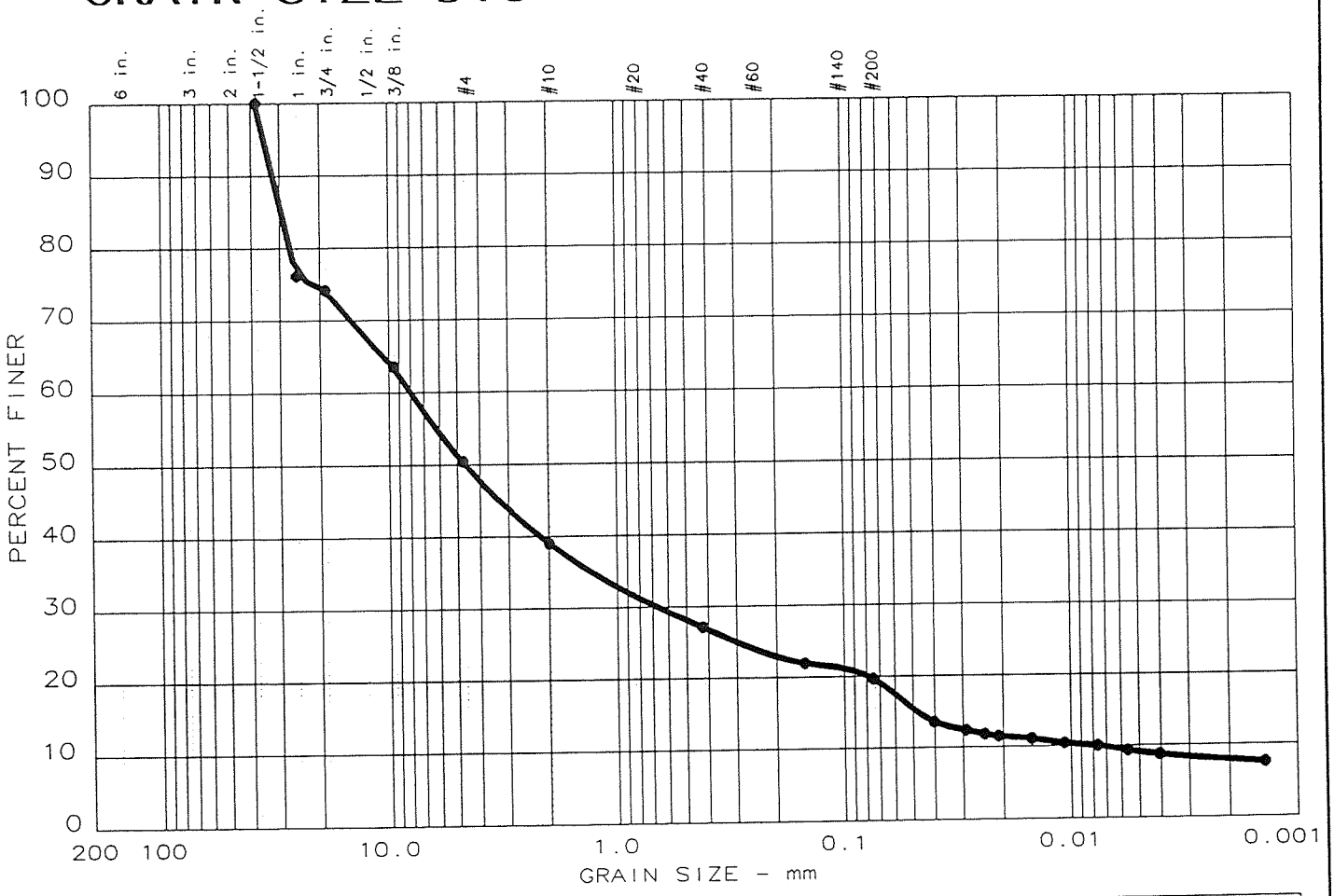
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.0	40.0	34.7	0.0130	41.0	9.6	0.0403	13.6
2.0	23.0	37.0	31.7	0.0130	38.0	10.1	0.0292	12.4
3.0	23.0	35.5	30.2	0.0130	36.5	10.3	0.0242	11.8
4.0	23.0	34.8	29.4	0.0130	35.8	10.4	0.0211	11.5
8.0	23.0	33.8	28.4	0.0130	34.8	10.6	0.0150	11.1
16.0	23.0	32.0	26.7	0.0130	33.0	10.9	0.0108	10.4
32.0	23.0	31.0	25.7	0.0130	32.0	11.0	0.0077	10.0
62.0	22.0	29.5	23.9	0.0132	30.5	11.3	0.0056	9.4
122.0	22.0	28.0	22.4	0.0132	29.0	11.5	0.0041	8.8
1074.0	22.0	25.0	19.4	0.0132	26.0	12.0	0.0014	7.6

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 49.6 % SAND = 30.7
% SILT = 10.6 % CLAY = 9.1

D85= 29.51 D60= 7.943 D50= 4.624
D30= 0.6607 D15= 0.04732 D10= 0.00741
Cc = 7.4131 Cu =1071.5193

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	49.6	30.7	10.6	9.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			29.5	7.94	4.62	0.661	0.0473	0.0074	7.41	1071.5

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellowish brown clayey-sandy gravel	GM	

Project No.: 946-02-000
Project: Vernon County landfill Balefill
● Location: S-6 MW 1RZ 58'- 60'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 6

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 11

Date: 4/23/03
Project No.: 946-02-000
Project: Vernon County landfill Balefill

Sample Data

Location of Sample: S-7 MW 1RZ 71'- 73'
Sample Description: Brown fat clay with sand
USCS Class: CH Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks: Monitoring wells

Fig. No.: 7

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	398.40	203.90
Tare =	75.60	75.60
Dry sample weight =	322.80	128.30

Minus #200 from wash= 60.3 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	13.60	0.00	95.8
# 4	29.50	0.00	86.6
# 10	23.80	0.00	79.3
# 40	20.50	0.00	72.9
# 100	34.20	0.00	62.3
# 200	6.40	0.00	60.3

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 60.3
Weight of hydrometer sample: 50
Calculated biased weight= 82.85
Automatic temperature correction
Composite correction at 20 deg C =-6

Meniscus correction only= 1
Specific gravity of solids= 2.71
Specific gravity correction factor= 0.987
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

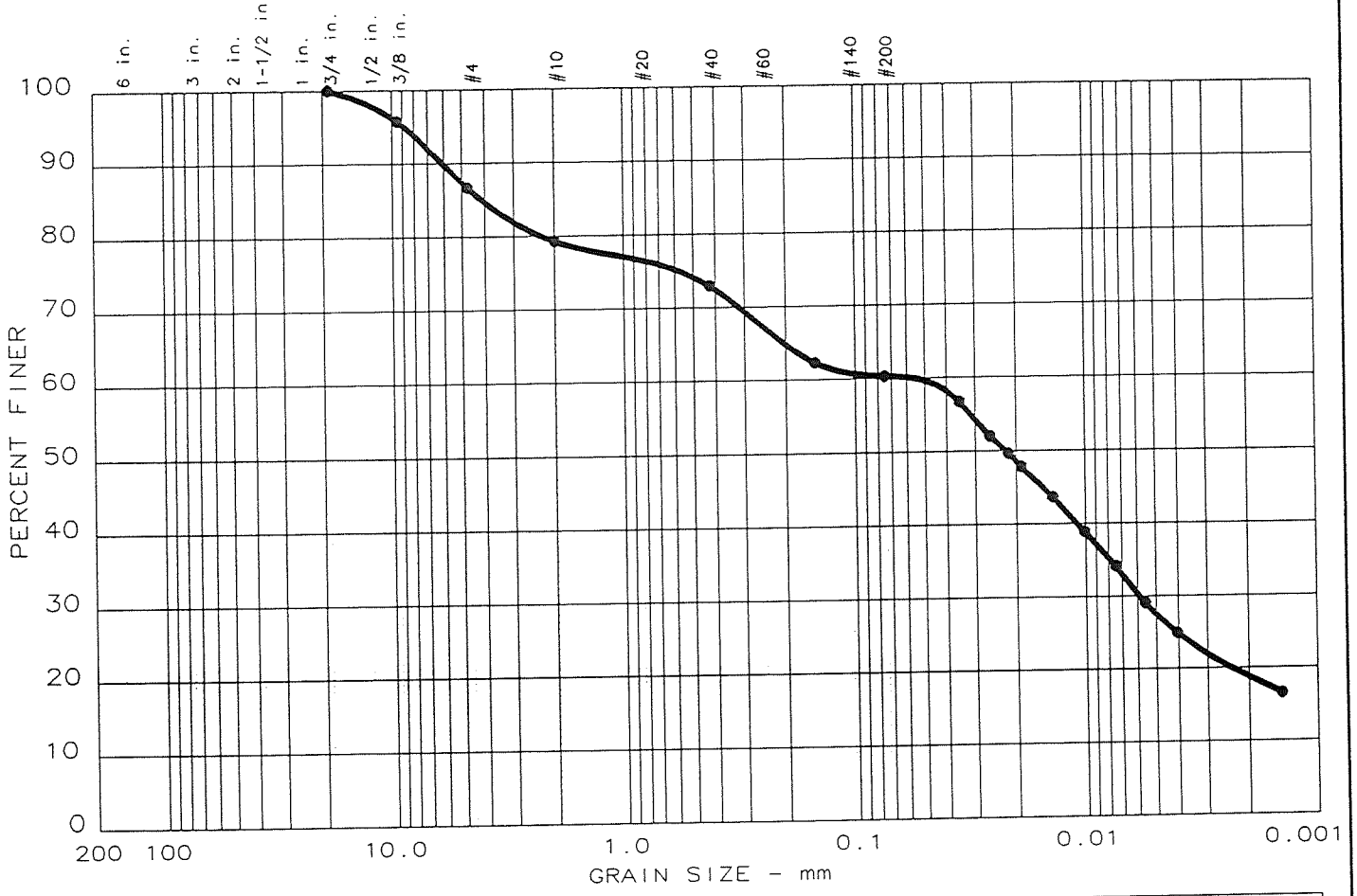
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.0	53.0	47.7	0.0129	54.0	7.4	0.0352	56.8
2.0	23.0	49.0	43.7	0.0129	50.0	8.1	0.0260	52.0
3.0	23.0	47.0	41.7	0.0129	48.0	8.4	0.0216	49.6
4.0	23.0	45.5	40.2	0.0129	46.5	8.7	0.0190	47.8
8.0	23.0	42.0	36.7	0.0129	43.0	9.2	0.0139	43.7
16.0	23.0	38.0	32.7	0.0129	39.0	9.9	0.0102	38.9
32.0	23.0	34.0	28.7	0.0129	35.0	10.6	0.0074	34.1
62.0	22.0	30.0	24.4	0.0131	31.0	11.2	0.0056	29.1
122.0	22.0	26.5	20.9	0.0131	27.5	11.8	0.0041	24.9
1065.0	22.0	19.5	13.9	0.0131	20.5	12.9	0.0014	16.6

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 13.4 % SAND = 26.3
SILT = 32.9 % CLAY = 27.4

D85= 4.12 D60= 0.053 D50= 0.022
D10= 0.0058

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	13.4	26.3	32.9	27.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			4.12		0.0221	0.0058				

MATERIAL DESCRIPTION	USCS	AASHTO
● Brown fat clay with sand	CH	

Project No.: 946-02-000
Project: Vernon County landfill Balefill
● Location: S-7 MW 1RZ 71'- 73'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 7

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 12

Date: 4/23/03
Project No.: 946-02-000
Project: Vernon County landfill Balefill

Sample Data

Location of Sample: S-8 MW 1RZ 76'- 78'
Sample Description: Light brown c-f silty sand
USCS Class: SM Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks: Monitoring wells

Fig. No.: 8

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	565.40	341.20
Tare =	74.80	74.80
Dry sample weight =	490.60	266.40

Minus #200 from wash= 45.7 %
Sieve tare method

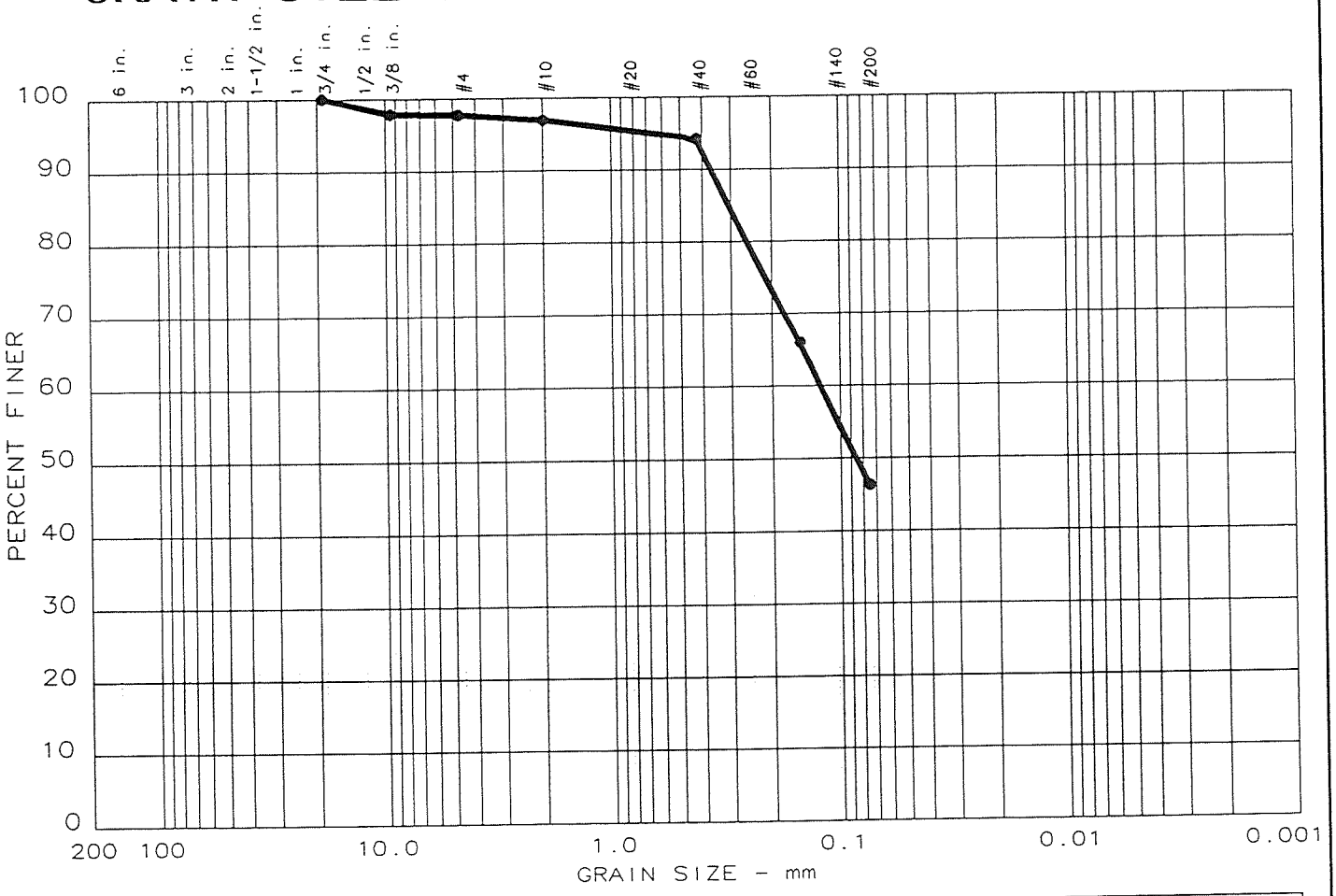
Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	10.50	0.00	97.9
# 4	0.60	0.00	97.7
# 10	3.90	0.00	96.9
# 40	13.20	0.00	94.3
# 100	138.40	0.00	66.0
# 200	96.70	0.00	46.3

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 2.3 % SAND = 51.4
% FINES = 46.3

D85= 0.31 D60= 0.122 D50= 0.085

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	2.3	51.4	46.3	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.305	0.122	0.0851					

MATERIAL DESCRIPTION	USCS	AASHTO
● Light brown c-f silty sand	SM	

Project No.: 946-02-000
Project: Vernon County landfill Balefill
● Location: S-8 MW 1RZ 76'- 78'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 8

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 13

Date: 4/23/03
Project No.: 946-02-000
Project: Vernon County landfill Balefill

Sample Data

Location of Sample: S-9 MW 1RZ 86'- 88'
Sample Description: Grayish brown c-f sand with fines
USCS Class: SP-SM Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks: Monitoring wells

Fig. No.: 9

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	518.50	469.90
Tare =	74.20	74.20
Dry sample weight =	444.30	395.70

Minus #200 from wash= 10.9 %
Sieve tare method

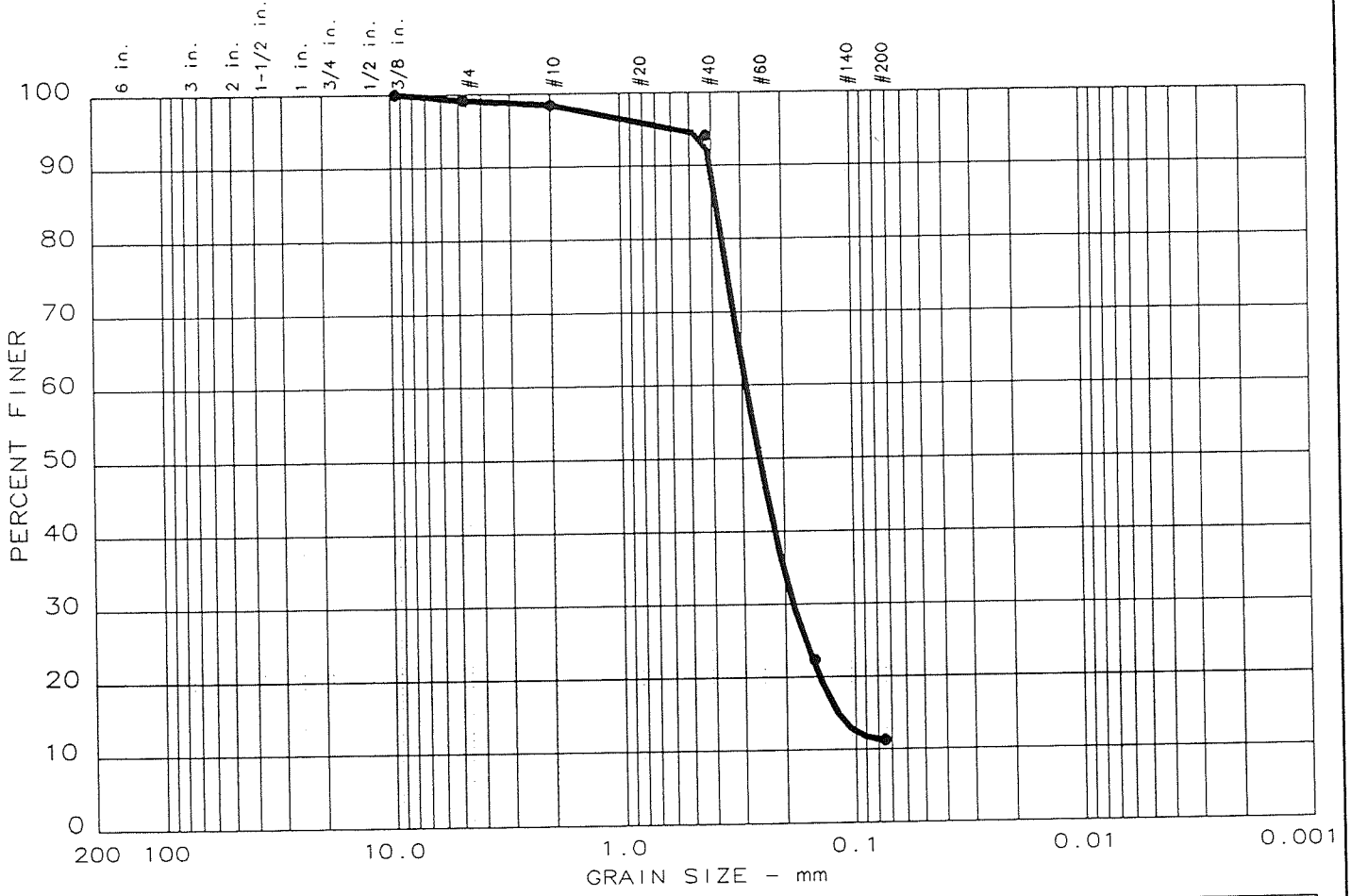
Sieve	Weight retained	Sieve tare	Percent finer
0.375 inches	0.00	0.00	100.0
# 4	3.90	0.00	99.1
# 10	3.10	0.00	98.4
# 40	19.40	0.00	94.1
# 100	318.60	0.00	22.3
# 200	49.20	0.00	11.3

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.9 % SAND = 87.8
% FINES = 11.3

D85= 0.38 D60= 0.288 D50= 0.253
D30= 0.1834 D15= 0.11844

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.9	87.8	11.3	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.384	0.288	0.253	0.183	0.118			

MATERIAL DESCRIPTION	USCS	AASHTO
● Grayish brown c-f sand with fines	SP-SM	

Project No.: 946-02-000
Project: Vernon County landfill Balefill
● Location: S-9 MW 1RZ 86'- 88'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 9

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 14

Date: 4/23/03
Project No.: 946-02-000
Project: Vernon County landfill Balefill

Sample Data

Location of Sample: S-10 MW 1RZ 88'- 90'
Sample Description: Light brown sandy gravel w/fines
USCS Class: GP-GM Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks: Monitoring wells

Fig. No.: 10

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	1305.00	1230.00
Tare =	14.10	74.40
Dry sample weight =	1290.90	1155.60

Minus #200 from wash= 10.5 %
Sieve tare method

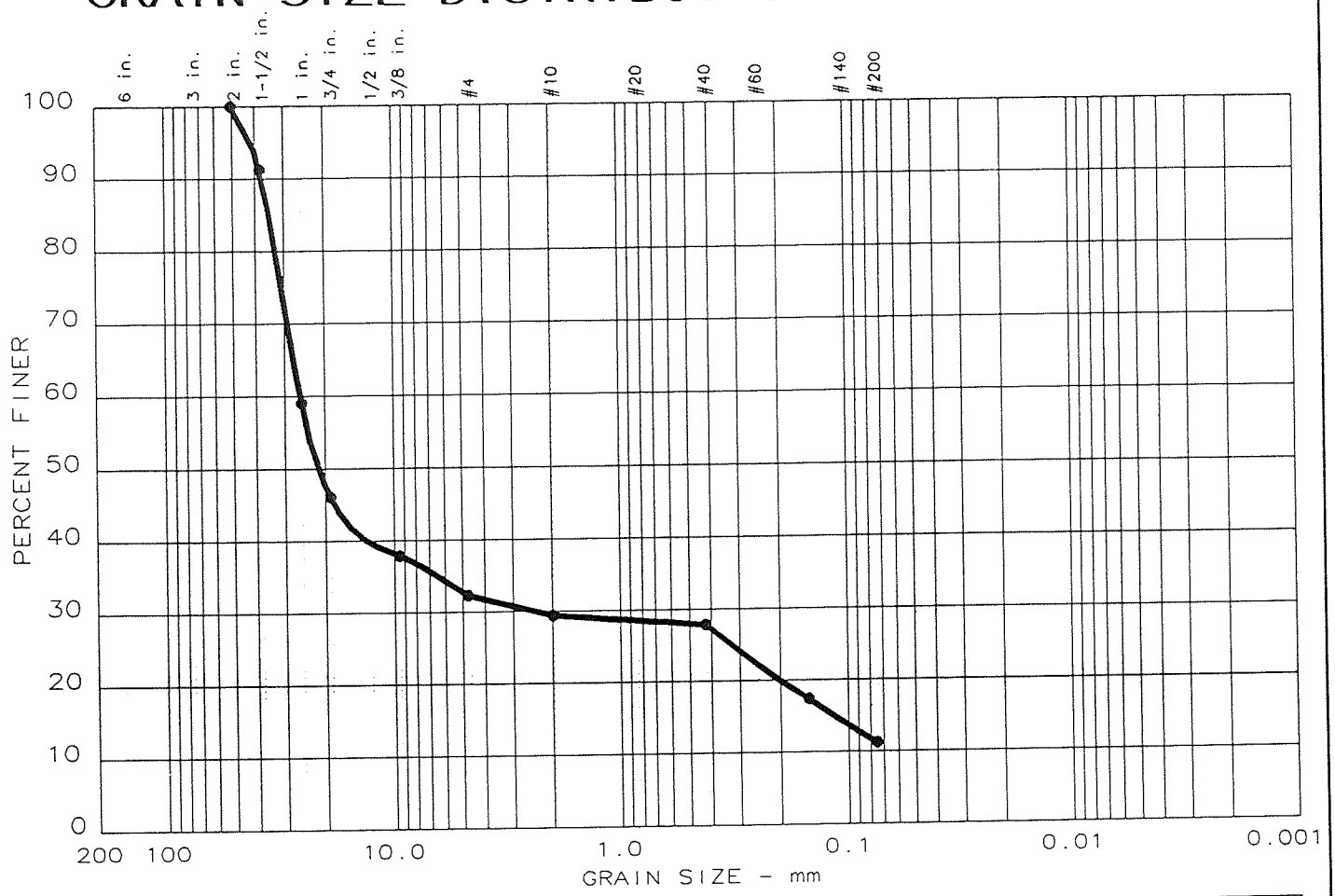
Sieve		Weight retained	Sieve tare	Percent finer
2	inches	0.00	0.00	100.0
1.5	inches	113.30	0.00	91.2
1	inches	415.30	0.00	59.1
0.75	inches	167.70	0.00	46.1
0.375	inches	106.10	0.00	37.8
# 4		72.00	0.00	32.3
# 10		37.00	0.00	29.4
# 40		20.20	0.00	27.8
# 100		134.60	0.00	17.4
# 200		79.70	0.00	11.2

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 67.7 % SAND = 21.0
% FINES = 11.3

D85= 34.67 D60= 25.704 D50= 21.380
D30= 2.3714 D15= 0.11614

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	67.7	21.0	11.3	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			34.7	25.7	21.4	2.37	0.116			

MATERIAL DESCRIPTION	USCS	AASHTO
● Light brown sandy gravel w/fines	GP-GM	

Project No.: 946-02-000
Project: Vernon County landfill Balefill
● Location: S-10 MW 1RZ 88'- 90'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 10

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 15

Date: 4/23/03
Project No.: 946-02-000
Project: Vernon County landfill Balefill

Sample Data

Location of Sample: S-1 MW 14Z 48'- 50'
Sample Description: Brown fat clay
USCS Class: CH Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks: Monitoring wells

Fig. No.: 11

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	375.10	87.50
Tare =	74.60	74.60
Dry sample weight =	300.50	12.90

Minus #200 from wash= 95.7 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	1.60	0.00	99.5
# 4	1.00	0.00	99.1
# 10	1.00	0.00	98.8
# 40	3.00	0.00	97.8
# 100	2.00	0.00	97.1
# 200	4.30	0.00	95.7

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 95.7
Weight of hydrometer sample: 50
Calculated biased weight= 52.24
Automatic temperature correction
Composite correction at 20 deg C =-6

Meniscus correction only= 1
Specific gravity of solids= 2.72
Specific gravity correction factor= 0.985
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

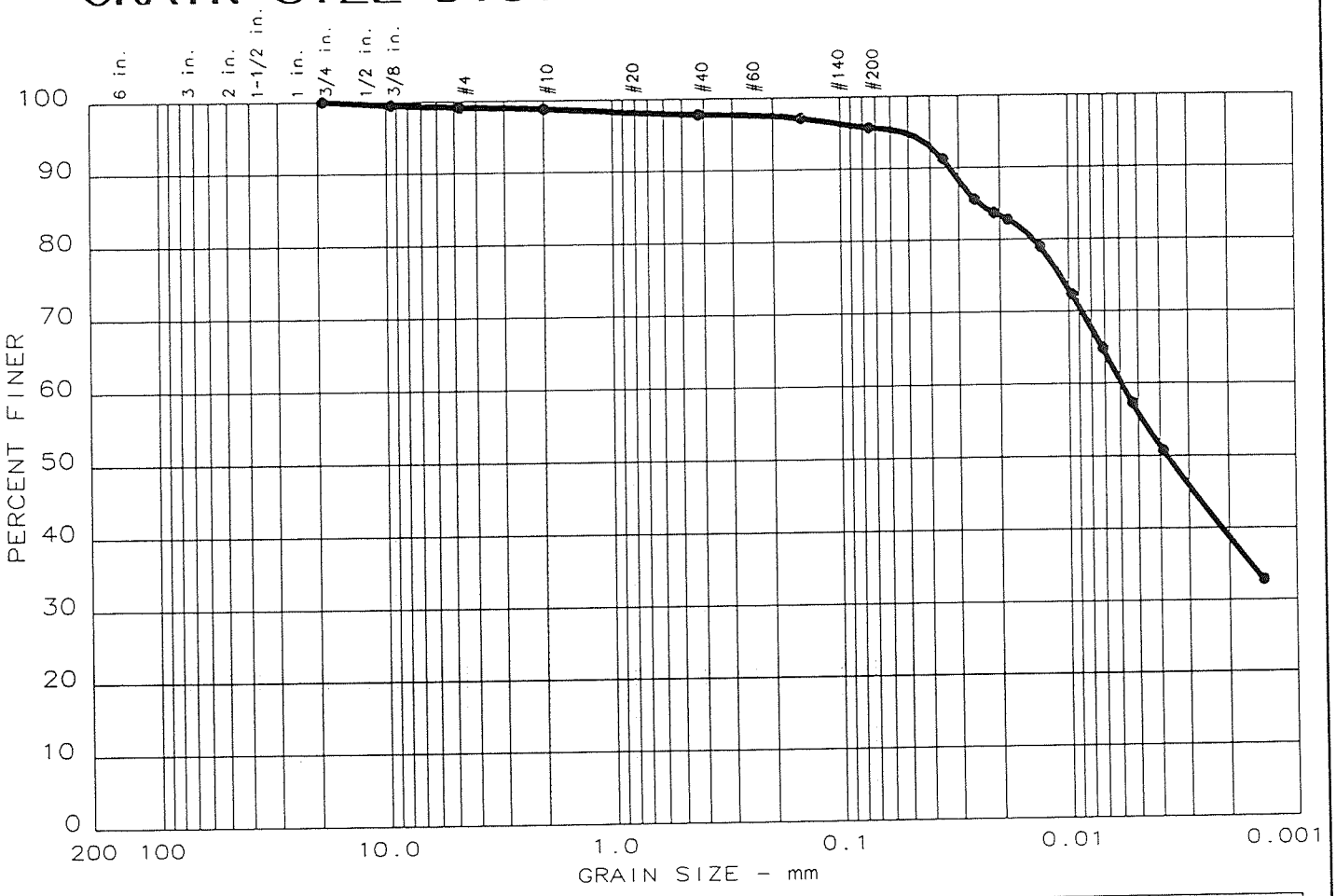
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	22.0	54.0	48.4	0.0130	55.0	7.3	0.0352	91.2
2.0	22.0	51.0	45.4	0.0130	52.0	7.8	0.0257	85.6
3.0	22.0	50.0	44.4	0.0130	51.0	7.9	0.0212	83.7
4.0	22.0	49.5	43.9	0.0130	50.5	8.0	0.0185	82.8
8.0	22.0	47.5	41.9	0.0130	48.5	8.3	0.0133	79.0
16.0	22.0	44.0	38.4	0.0130	45.0	8.9	0.0097	72.4
32.0	22.0	40.0	34.4	0.0130	41.0	9.6	0.0071	64.9
62.0	22.0	36.0	30.4	0.0130	37.0	10.2	0.0053	57.3
122.0	22.0	32.5	26.9	0.0130	33.5	10.8	0.0039	50.7
1056.0	22.0	23.0	17.4	0.0130	24.0	12.4	0.0014	32.8

Fractional Components

ravel/Sand based on #4 sieve
and/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.9 % SAND = 3.4
SILT = 39.7 % CLAY = 56.0

35= 0.02 D60= 0.006 D50= 0.004

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.9	3.4	39.7	56.0

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●					0.0037					

MATERIAL DESCRIPTION	USCS	AASHTO
● Brown fat clay	CH	

Project No.: 946-02-000
Project: Vernon County landfill Balefill
● Location: S-1 MW 14Z 48'- 50'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 11

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 16

Date: 4/23/03
Project No.: 946-02-000
Project: Vernon County landfill Balefill

Sample Data

Location of Sample: S-2 MW 14Z 66'
Sample Description: Brown sandy silty lean clay
USCS Class: CL Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks: Monitoring wells

Fig. No.: 12

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	492.90	203.90
Tare =	75.30	75.30
Dry sample weight =	417.60	128.60

Minus #200 from wash= 69.2 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.375 inches	0.00	0.00	100.0
# 4	2.40	0.00	99.4
# 10	6.70	0.00	97.8
# 40	22.00	0.00	92.6
# 100	59.10	0.00	78.4
# 200	37.20	0.00	69.5

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 69.5
Weight of hydrometer sample: 50
Calculated biased weight= 71.95
Automatic temperature correction
Composite correction at 20 deg C =-6

Meniscus correction only= 1
Specific gravity of solids= 2.68
Specific gravity correction factor= 0.993
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

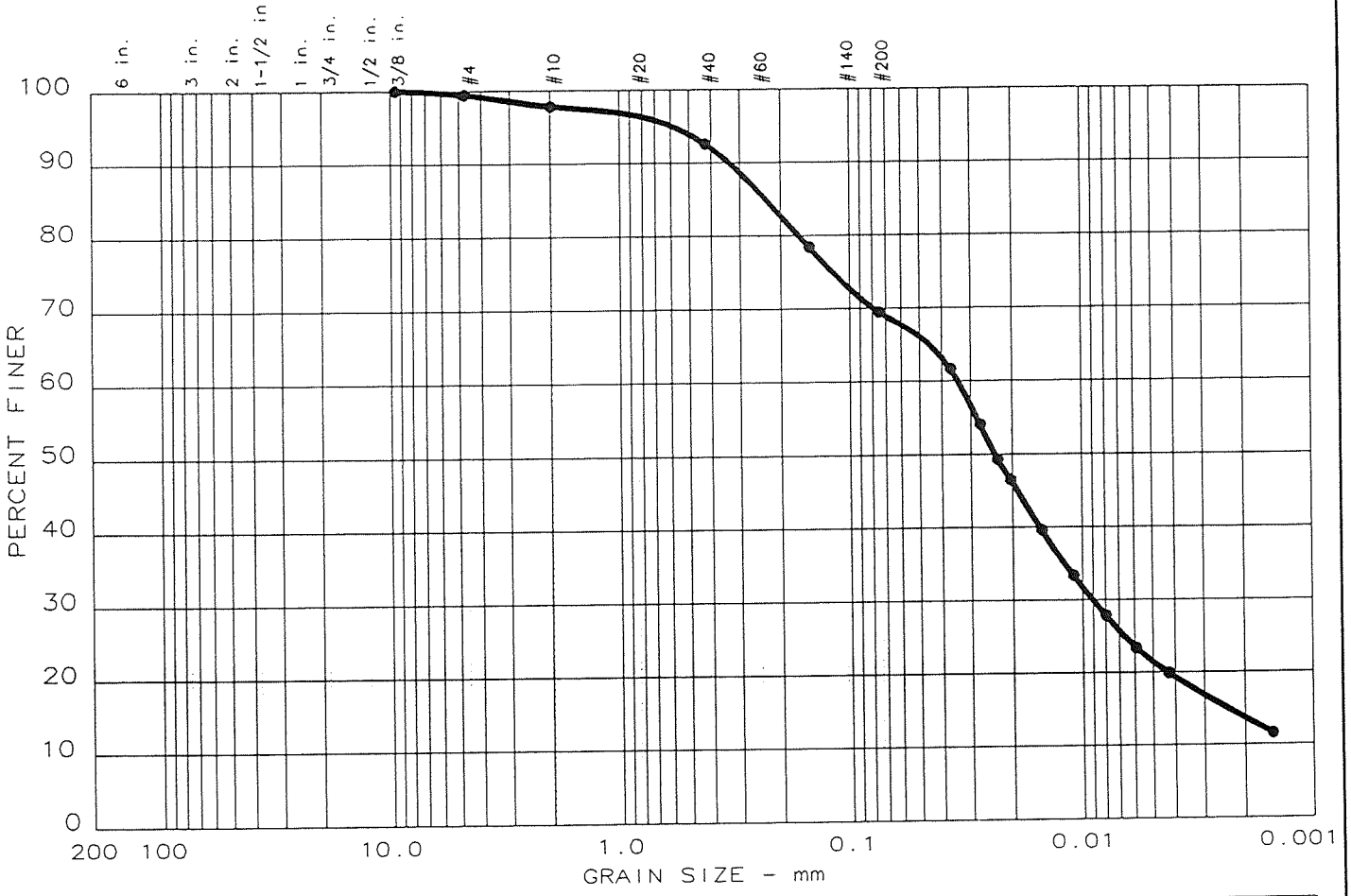
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.0	50.0	44.7	0.0130	51.0	7.9	0.0367	61.7
2.0	23.0	44.5	39.2	0.0130	45.5	8.8	0.0274	54.1
3.0	23.0	41.0	35.7	0.0130	42.0	9.4	0.0231	49.2
4.0	23.0	39.0	33.7	0.0130	40.0	9.7	0.0203	46.5
8.0	23.0	34.0	28.7	0.0130	35.0	10.6	0.0150	39.6
16.0	23.0	29.5	24.2	0.0130	30.5	11.3	0.0110	33.4
32.0	23.0	25.5	20.2	0.0130	26.5	11.9	0.0080	27.8
62.0	22.0	22.5	16.9	0.0132	23.5	12.4	0.0059	23.3
122.0	22.0	20.0	14.4	0.0132	21.0	12.9	0.0043	19.9
1047.0	22.0	14.0	8.4	0.0132	15.0	13.8	0.0015	11.6

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.6 % SAND = 29.9
SILT = 48.1 % CLAY = 21.4

D35= 0.23 D60= 0.034 D50= 0.024
D30= 0.0090 D15= 0.00237

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.6	29.9	48.1	21.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.232		0.0237	0.0090	0.0024			

MATERIAL DESCRIPTION	USCS	AASHTO
● Brown sandy silty lean clay	CL	

Project No.: 946-02-000
Project: Vernon County landfill Balefill
● Location: S-2 MW 14Z 66'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 12

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 17

Date: 4/23/03
Project No.: 946-02-000
Project: Vernon County landfill Balefill

Sample Data

Location of Sample: S-3 MW 14Z 76'- 78'
Sample Description: Brown c-f sand w/fines & gravel
USCS Class: SM Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks: Monitoring wells

Fig. No.: 13

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	576.90	475.70
Tare =	74.30	74.30
Dry sample weight =	502.60	401.40

Minus #200 from wash= 20.1 %
Sieve tare method

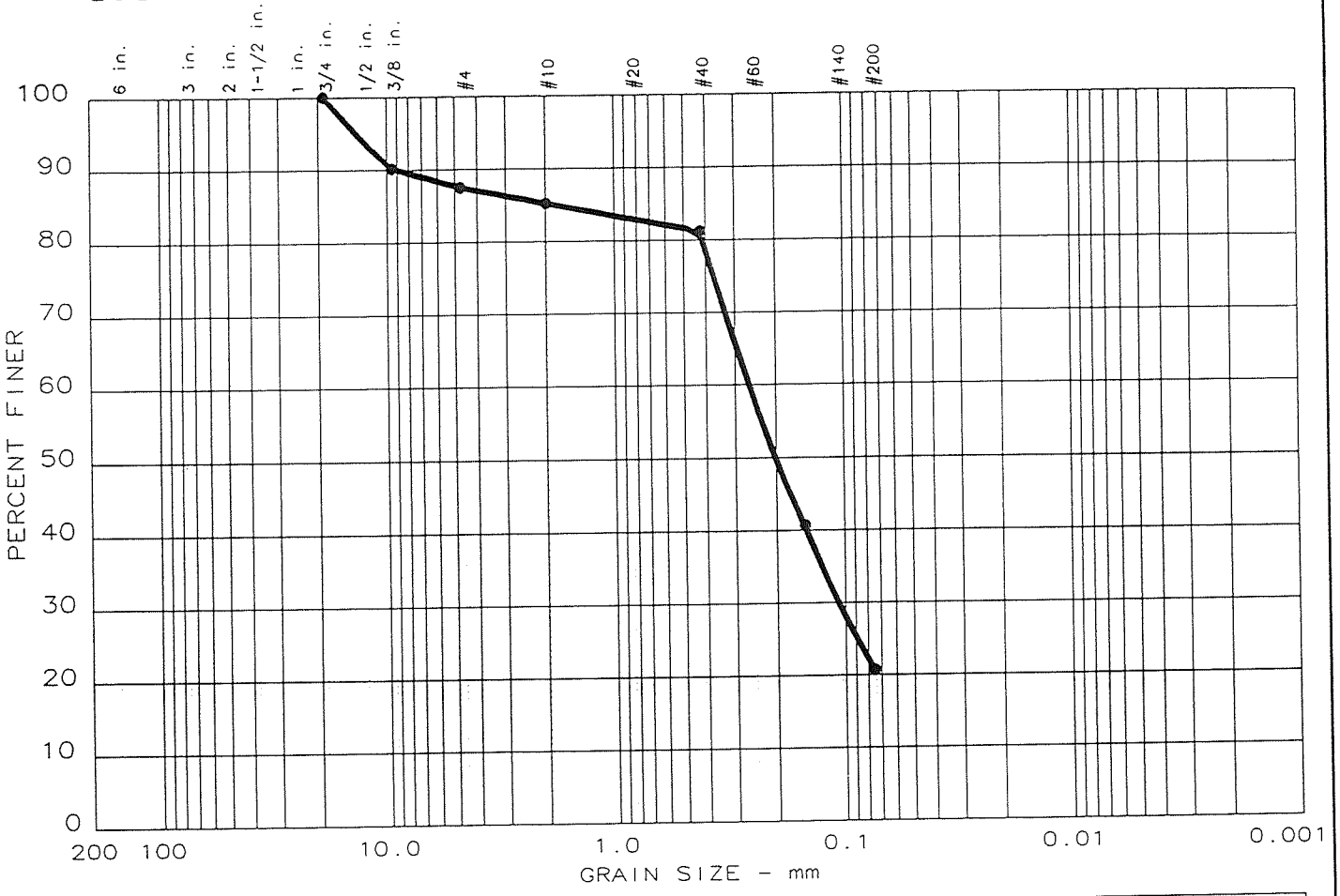
Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	49.50	0.00	90.2
# 4	13.40	0.00	87.5
# 10	11.50	0.00	85.2
# 40	19.90	0.00	81.2
# 100	203.90	0.00	40.7
# 200	100.20	0.00	20.7

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 12.5 % SAND = 66.8
% FINES = 20.7

D85= 1.78 D60= 0.260 D50= 0.201
D30= 0.1069

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	12.5	66.8	20.7	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			1.78	0.260	0.201	0.107				

MATERIAL DESCRIPTION	USCS	AASHTO
● Brown c-f sand w/fines & gravel	SM	

Project No.: 946-02-000
Project: Vernon County landfill Balefill
● Location: S-3 MW 14Z 76'- 78'

Date: 4/23/03

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Monitoring wells

Figure No. 13

Engineers

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FINAL TEST INFORMATION

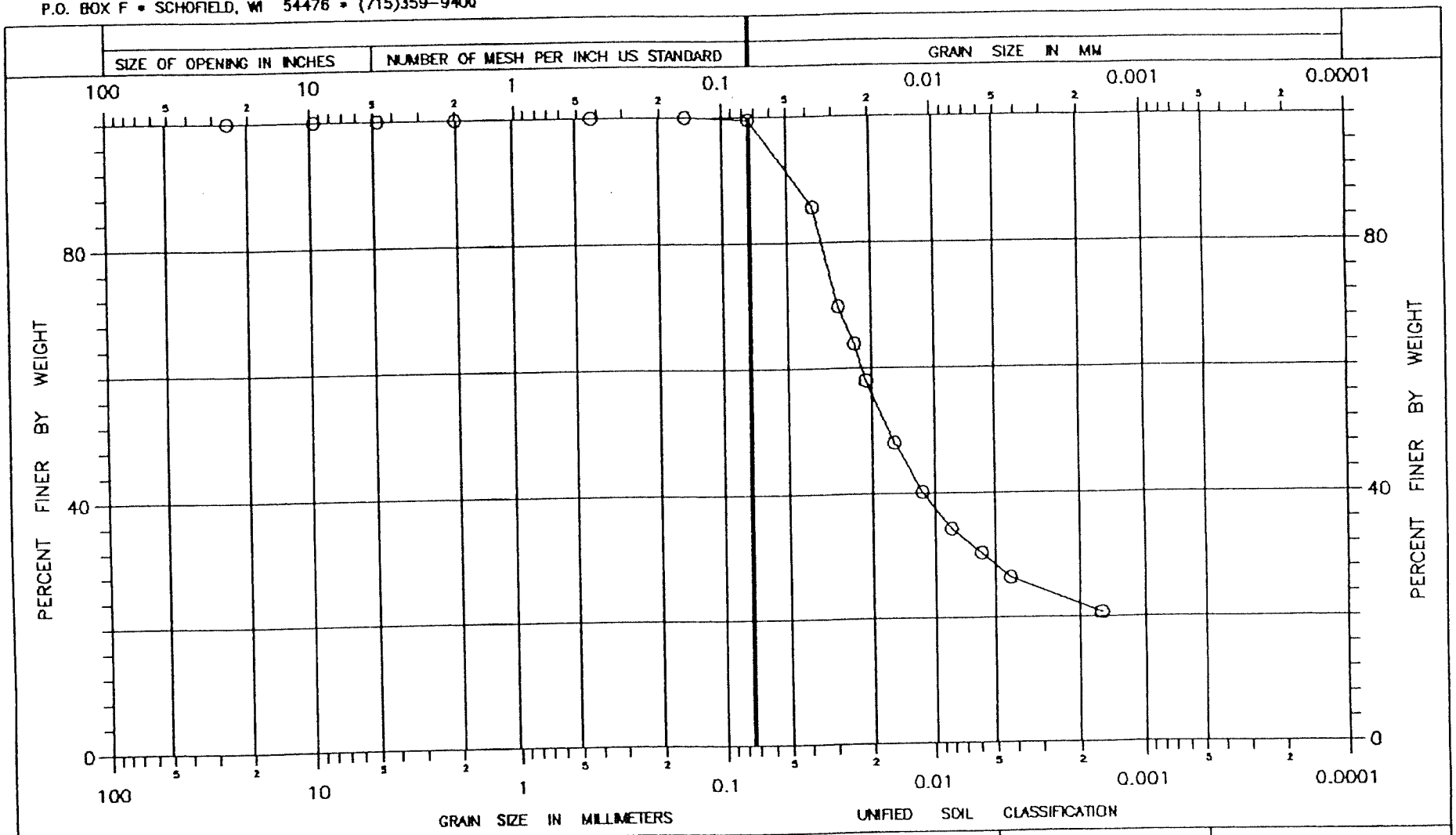
PROJECT: Vernon County Proposed Landfill JOB NO. 57786 DATE June 3, 1988

Boring No.	Sample No.	Depth	Field Class	GRADATION - % PASSING									LL	PI	USCS	Wn %	e	Yd P.C.F.	GS	k -(CM/S)
				.005	.02	200	100	#40	#10	#4	3/8"	3/4"								
TB-1		.5' - 9.5'		20.0	55.0	96.9	98.2	99.7	100	-	-	-	31.5	8.6	CL					2.44×10^{-7}
TB-1		9.5' - 10.5'		42	68								51.8	35.2	CL					
TB-1		10.5' - 12'				44.6	54.37	91.4	99.97	100	-	-			SC					
TB-1		12' - 13'				49.4	53.5	93.7	100	-	-	-			SC					
TB-3		1.5' - 6.0'		42	67								47.1	27.9	CL					2.34×10^{-8}
TB-3		8.5' - 13.0'		52	72	58.7	66.5	85.7	93.0	96.0	100	-	48.5	29.77	CL					
TB-4		2' - 4'		50	68								53.4	33.8	CL					
TB-4		7' - 8'				18.8	23.8	65.7	87.6	93.3	100	-			SC					
TB-5		2.0' - 7.5'		69	86								55.3	32.2	CL					1.13×10^{-6}
TB-5		7.5' - 10.0'				36.6	40.6	82.3	99.2	99.8	100	-			SC					
TB-6		8' - 13.5'		47	72										CL					
TB-7		2.5' - 16.0'		24	59								32.3	12.15	CL					
TB-8		2.0' - 6.5'		26	56								37.8	14.5	CL					
TB-8		6.5' - 12.0'		49	68	18.17	25.0	78.1	98.8	99.5	100	-			SC					1.35×10^{-2}
TB-8		14' - 22'				37.9	43.1	77.7	85.7	89.8	100	-			SC					2.96×10^{-7}
TB-9		1.5' - 9.0'		24.0	62.0							-	25.4	8.1	CL					
TB-9		10' - 22'				12.1	20.2	82.1	96.7	98.3	100	-			SM					

Central Wisconsin
Engineers
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GRAIN SIZE DISTRIBUTION CURVE

PROJECT: Vernon County
DATE: 9/27/89
JOB NO: 70389



BORING NO. Test Pit 7	GRAVEL 0.0%	F. SAND 0.48%	D_{60}	C_U	○○○○○ MECHANICAL
SAMPLE NO. S1-7	C. SAND 0.0%	SILT 71.53%	D_{30}	C_z	○○○○○ HYDROMETER
DEPTH 1.5'-2.0'	M. SAND 0.0%	CLAY 28.0%	D_{10}	UNIFIED CLASS CL	
ELEV.					

Geotechnical Factual Report

Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

Prepared for

Vernon County Solid Waste & Recycling Department

Project B2205032

July 12, 2023
Braun Intertec Corporation

BRAUN INTERTEC
The Science You Build On.

Braun Intertec Corporation
2309 Palace Street
La Crosse, WI 54603

Phone: 608.781.7277
Fax: 608.781.7279
Web: braunintertec.com

July 12, 2023 Project B2205032

Ms. Stacie Sanborn
Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Re: Geotechnical Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

Dear Ms. Sanborn:

We are pleased to present this Geotechnical Factual Report for the Vernon County Landfill located at S3705 County Road LF in Viroqua, Wisconsin. This summary report provides our borings logs and laboratory test results for the project.

Thank you for making Braun Intertec your geotechnical consultant for this project. If you have questions about this report, or if there are other services that we can provide in support of our work to date, please contact Brandon Wright at 608.781.7277 or by email (bwright@braunintertec.com).

Sincerely,

BRAUN INTERTEC CORPORATION

Brandon K. Wright, PE
Technical Manager, Senior Engineer

Philip E. Bailey, PE
Business Unit Leader, Senior Engineer

C: Ms. Melissa Lindenfelser, Short Elliott Hendrickson

AA/EOE

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Appendix A
Soil Boring Location Sketch
Log of Boring Sheets B-18 to B-21 & MW-14WT to MW-17WT
Descriptive Terminology of Soil

Appendix B
Laboratory Test Results
-Classification Test Results (4)
-Atterberg Limits (2)
-Sieve Hydrometer Test Results (23)
-Proctor Test Results (6)
-Hydraulic Conductivity (5)
-Specific Gravity (2)
-Triaxial (CU) Test Results (5)

A. Introduction

A.1. Project Description

This Geotechnical Factual Report provides a summary of our subsurface exploration and laboratory test results for the Vernon County Landfill located at S3705 County Road LF in Viroqua, Wisconsin.

A.2. Site Conditions and History

Currently, the site exists as an active landfill. An aerial photograph of the site is shown in Photograph 1 below.

Photograph 1. Aerial Photograph of the Site



Photograph provided by Google Earth™.

A.3. Background Information and Reference Documents

We reviewed the following information:

- Aerial photographs of the site on Google Earth™
- Web based Geographic Information Systems (GIS) sites to assess topographic data and land records for the site.
- Communications with Short Elliott Hendrickson regarding project details.

A.4. Scope of Services

We performed our scope of services for the project in accordance with our Proposal QTB156849 to Vernon County Solid Waste and Recycling Department care of Short Elliott Hendrickson, dated April 22, 2022. The following list describes the geotechnical tasks completed in accordance with our authorized scope of services.

- Clearing the exploration location of underground utilities. Short Elliott Hendrickson selected the exploration locations. Ground elevations and boring coordinates were collected by others and were later provided to us. The Soil Boring Location Sketch included in the Appendix shows the approximate locations of the borings.
- Performing eight (8) standard penetration test (SPT) borings, denoted as Borings B-18 to B-21 & MW-14WT to MW-17WT. Four of the borings were drilled to depths of 30 feet and four borings were drilled depths of 100 feet to allow for installation of permanent groundwater monitoring wells.
- Performing laboratory testing on select samples.
- Preparing this report containing a boring location sketch, logs of soil borings, a summary of the soils encountered, and results of laboratory testing.

B. Results

B.1. Geologic Overview

We based the geologic origins used in this report on the soil types, laboratory testing, and available common knowledge of the geological history of the site. Because of the complex depositional history, geologic origins can be difficult to ascertain. We did not perform a detailed investigation of the geologic history for the site.

B.2. Boring Results

Table 1 provides a summary of the soil boring results; in the general order we encountered the strata. Please refer to the Log of Boring sheets in the Appendix for additional details.

Table 1. Subsurface Profile Summary*

Strata**	Soil Type - ASTM Classification	Range of Penetration Resistances	Commentary and Details
Topsoil Fill	CL, CH, SC	NA	▪ Topsoil was composed of lean clay, fat clay, and clayey sand. ▪ Contained trace roots and was dark brown to black. ▪ Thickness was about 1 to 1 ½-feet. ▪ Moisture condition was moist.
Fill***	CH, CL, CL-ML, ML, SP, SC, GC	2 to 80 BPF	▪ Beneath the topsoil fill, the borings encountered fill. ▪ Fill extended to depths of 9 to 31 feet. ▪ Fill is composed mainly of clayey soils, but also contained sand and gravels intermixed with clayey and silty soils. ▪ Penetration resistance testing in the fill suggests the fill was not placed or compacted uniformly. ▪ Moisture condition was moist.
Alluvial	SC, SM, SP-SM, CH, CL, ML	2 to 20 BPF	▪ Beneath the fill, the borings encountered alluvial soils. ▪ Alluvial soils were intermixed and were composed of sand, silt, and clay soils. ▪ Penetration resistance testing indicates the clayey soils are soft to very stiff and the silty and sandy soils are loose to medium dense. ▪ Moisture condition (dry, moist, or wet).

Strata**	Soil Type - ASTM Classification	Range of Penetration Resistances	Commentary and Details
Residuum	CL, CH, SC	11 to 22 BPF & >50	▪ Below the fill and alluvial soils, the borings encountered residual soils. ▪ Residual soils were composed sand, silt, clay, and gravel soils. ▪ Penetration resistance testing in the clayey soils indicate it was stiff to hard. ▪ Penetration resistance testing in the sand and gravel soils indicates it was medium dense to very dense.
	SP, ML, SM	20 to 47 BPF & >50	
	GM, GC	24 to 36 & BPF >50	
Bedrock	Dolostone	50 blows for less than 6 inches of penetration	▪ Below the alluvial and residual soils, our borings encountered dolostone bedrock. Retrieved split-spoon samples in the bedrock were tan and were dry to moist. The retrieved samples were slightly- to highly-weathered. ▪ The bedrock was cored at one location. The rock cores returned RQD values from 8 to 16 and recovery varied from 30 to 44 percent.

*Abbreviations defined in the attached Descriptive Terminology sheets.
**It should be noted that collected SPT samples for Borings MW-14WT and MW-16 were collected with a failing hollow-stem auger plug. The soil samples from these two borings are still generally representative of the soil column above the bedrock, they may not be representative of those specific depths and may be mixed with soil from other strata.
***For simplicity in this report, we define existing fill to mean existing, uncontrolled, or undocumented fill.

B.3. Groundwater

We did not observe groundwater while performing our borings. Groundwater may take days or longer to reach equilibrium in the boreholes and we immediately backfilled the boreholes, in accordance with our scope of work. If the project team identifies a need for more accurate determination of groundwater depth, we can install piezometers. Project planning should anticipate seasonal and annual fluctuations of groundwater. Following installation of monitoring wells, Short Elliott Hendrickson measured groundwater elevations as noted in Table 2.

Table 2. Monitoring Well Summary

Location	Measured Depth to Groundwater (ft)	Corresponding Elevation (ft)
MW-14WT	100.63	1146.52
MW-15WT	Not Observed	Not Observed
MW-16	81.54	1102.73
MW-17WT	80.27	1116.16

B.4. Laboratory Test Results

Laboratory testing was completed in general accordance with American Society for Testing and Materials (ASTM) standards. More information including soil characteristics and laboratory test results are presented in the following subsections.

B.4.a. Laboratory Soil Classification Tests

Tables 3 and 4 present the results of our laboratory tests.

Table 3. Laboratory Classification Test Results

Boring	Sample Depth (ft)	USCS Soil Classification	Moisture Content (w, %)	Liquid Limit	Plastic Index	Particle Size			
						% Gravel	% Sand	% Silt	% Clay
B-18	0 – 2	CL	20	38	19	1.1	14.6	54.0	30.3
B-18	2 ½	CH	27	64	40	0.0	14.4	20.4	65.2
B-18	5	CH	27	51	32	0.0	36.5	17.7	45.8
B-18	7 ½	SP	10	---	---	---	---	---	---
B-18	10	SC	15	39	24	0.0	58.6	8.9	32.5
B-18	12 ½	CH	27	72	49	0.0	29.5	14.2	56.3
B-18	15	SC	20	---	---	---	---	---	---
B-18	17 ½	CH	16	---	---	---	---	---	---
B-19	0 – 2	CH	---	50	33	0.0	25.5	30.5	44.0
B-19*	0 – 2	CH	---	51	33	---	---	---	---
B-19	2 ½	CH	16	52	33	23.7	22.7	22.1	31.5
B-19	5	CH	44	---	---	---	---	---	---
B-19	7 ½	CH	53	---	---	---	---	---	---
B-19	10	CH	54	---	---	---	---	---	---
B-19	12 ½	GC	33	---	---	---	---	---	---
B-19	15	GC	40	---	---	---	---	---	---
B-19	17 ½	CH	57	105	71	0.0	3.3	8.4	88.3
B-19	20	CH	57	---	---	---	---	---	---
B-20	0 – 2	CH	---	58	42	0.0	35.1	16.2	48.7
B-20*	0 – 2	CL	---	35	12	---	---	---	---
B-20	2 ½	CL	19	---	---	---	---	---	---
B-20	5	CL	27	---	---	---	---	---	---
B-20	7 ½	CH	33	---	---	---	---	---	---
B-20	10	SC	15	---	---	---	---	---	---
B-20	12 ½	CH	30	---	---	---	---	---	---

Boring	Sample Depth (ft)	USCS Soil Classification	Moisture Content (w, %)	Liquid Limit	Plastic Index	Particle Size			
						% Gravel	% Sand	% Silt	% Clay
B-20	15	CH	46	---	---	---	---	---	---
B-20	17 ½	CH	39	---	---	---	---	---	---
B-21	0 – 2	CH	---	67	48	0.0	25.4	26.4	48.2
B-21	2 ½	CH	24	50	34	0.0	24.5	29.3	46.2
B-21	5	CH	25	---	---	---	---	---	---
B-21	7 ½	ML	19	---	---	---	---	---	---
B-21	10	CL	17	36	18	2.9	11.5	56.6	29
B-21	12 ½	CL	19	36	14	0.0	6.2	65.2	28.6
B-21	15	CL	20	---	---	---	---	---	---
B-21	17 ½	CL	18	36	18	0.0	11.6	58.8	29.6
B-21	20	CL	19	40	21	0.0	4.9	63.6	31.5
B-21	25	CL	19	---	---	---	---	---	---
B-21	30	CL	18	33	13	0.0	1.4	72.7	25.9

*Bulk samples collected on May 24, 2023.

Table 4. Laboratory Classification Test Results

Boring	Sample Depth (ft)	USCS Soil Classification	Moisture Content (w, %)	Liquid Limit	Plastic Index	Particle Size			
						% Gravel	% Sand	% Silt	% Clay
MW-14WT	7 ½	CH	37	64	42	0.0	32.0	9.8	58.2
MW-15WT	17 ½	CH	46	109	73	0.0	2.6	7.5	89.9
MW-16	7 – 9	CL	---	43	21	---	---	---	---
MW-16	10 – 12	CL	24	37	16	0.0	3.9	66.0	30.1
MW-16	25	SC	18	41	24	0.0	62.1	11.4	26.5
MW-17WT	5	SC	20	59	40	12.7	44.6	7.8	34.9
MW-17WT	7 ½	SC	17	39	27	8.9	47.7	13.4	30.0
MW-17WT	10	SC	16	41	29	0.0	51.9	14.2	33.9

B.4.b. Moisture-Density Relationship (Proctor Tests)

We performed standard and modified Proctor tests on bulk samples collected from subgrade soils. The results are presented in Table 5.

Table 5. Standard and Modified Proctor Summary

Boring	Depth (ft)	Standard Proctor (ASTM D698)		Modified Proctor (ASTM D1557)	
		Maximum Dry Density (pcf)	Optimum Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)
B-19	0 – 2	105.0	19.6	116.7	15.0
B-19*	0 – 2	104.3	17.8	---	---
B-20*	0 – 2	106.0	19.6	---	---
B-21	0 – 2	100.0	22.1	112.3	16.1

*Bulk samples collected on May 24, 2023.

B.4.c. Remolded Permeability Tests

We performed remolded permeability tests on bulk samples of the materials obtained from within the upper 2 feet of the borings in accordance with ASTM D5084. The results of the permeability tests are presented in Table 6.

Table 6. Summary of Hydraulic Conductivity

Boring	Depth (ft)	USCS Soil	Moisture (%)		Density (pcf)		Average Hydraulic Conductivity (cm/sec)
			Initial	Final	Initial	Final	
B-19*	0 – 2	CH	18.0	24.3	106.3	101.1	5.4 E-09
B-19*	0 – 2	CH	19.7	24.3	101.6	100.9	6.1 E-09
B-20*	0 – 2	CL	22.0	24.8	98.4	99.7	3.0 E-07
MW-14WT	26 – 28 ½	CL	25.3	24.1	101.2	102.9	3.1 E-08
MW-16	10 – 12	CL	25.7	25.4	103.3	102.6	3.0 E-08

*Bulk samples collected on May 24, 2023.

B.4.d. Specific Gravity

We performed specific gravity tests on bulk samples collected from Boring B-19 and B-20. The specific gravity for each sample is summarized in Table 7.

Table 7. Summary of Specific Gravity

Boring	Depth	USCS Soil	Specific Gravity
B-19*	0 – 2	CH	2.67
B-20*	0 – 2	CL	2.66

*Bulk samples collected on May 24, 2023.

B.4.e. Triaxial Test Results

We performed consolidated undrained triaxial tests in accordance with the ASTM D4767. The results of this test are summarized in Table 8.

Table 8. Summary of Triaxial Tests

Boring	Depth (ft)	Item	Consolidated Undrained (CU)		Unconsolidated Undrained (UU)
			Total	Effective	
B-19*	0 – 2	Cohesion, tsf	0.2742	0.2097	0.7848
		ϕ, degrees	12.5	23.3	0
		tan (ϕ)	0.22	0.43	0
B-20*	0 – 2	Cohesion, tsf	0.4281	0	0.4152
		ϕ, degrees	15.4	34.8	0
		tan (ϕ)	0.28	0.69	0
MW-16	7 – 9	Cohesion, tsf	0.9366	0.2976	---
		ϕ, degrees	11.4	28.5	---
		tan (ϕ)	0.20	0.54	---

*Bulk samples collected on May 24, 2023.

C. Procedures

C.1. Penetration Test Borings

We drilled the penetration test borings with an all-terrain core and auger drill equipped with hollow-stem auger. We performed the borings in general accordance with ASTM D6151 taking penetration test samples at 2 1/2- or 5-foot intervals in general accordance with ASTM D1586. We collected thin-walled tube samples in general accordance with ASTM D1587 at selected depths. The boring logs show the actual sample intervals and corresponding depths. We also collected bulk samples of auger cuttings at selected locations for laboratory testing.

C.2. Exploration Logs

C.2.a. Log of Boring Sheets

The Appendix includes Log of Boring sheets for our penetration test borings. The logs identify and describe the penetrated geologic materials and present the results of penetration resistance tests performed. The logs also present the results of laboratory tests performed on penetration test samples, and groundwater measurements.

We inferred strata boundaries from changes in the penetration test samples and the auger cuttings. Because we did not perform continuous sampling, the strata boundary depths are only approximate. The boundary depths vary away from the boring locations, and the boundaries themselves may occur as gradual rather than abrupt transitions.

C.2.b. Geologic Origins

We assigned geologic origins to the materials shown on the logs and referenced within this report, based on: (1) a review of the background information and reference documents cited above, (2) visual classification of the various geologic material samples retrieved during the course of our subsurface exploration, (3) penetration resistance testing performed for the project, (4) laboratory test results, and (5) available common knowledge of the geologic processes and environments that have impacted the site and surrounding area in the past.

C.3. Material Classification and Testing

C.3.a. Visual and Manual Classification

We visually and manually classified the geologic materials encountered based on ASTM D2488. When we performed laboratory classification tests, we used the results to classify the geologic materials in accordance with ASTM D2487. The Appendix includes a chart explaining the classification system we used.

C.3.b. Laboratory Testing

The exploration logs in the Appendix note most of the results of the laboratory tests performed on geologic material samples. The remaining laboratory test results follow the exploration logs. We performed the tests in general accordance with ASTM procedures.

C.4. Groundwater Measurements

The drillers checked for groundwater while advancing the penetration test borings, and again after auger withdrawal. Where monitoring wells were installed, Short Elliott Hendrickson measured and recorded observed groundwater depths.

D. Qualifications

D.1. Variations in Subsurface Conditions

D.1.a. Material Strata

We developed our boring logs from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth. Therefore, we must infer strata boundaries and thicknesses. Strata boundaries may also be gradual transitions, and project planning should expect the strata to vary in depth, elevation, and thickness, away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until performing additional exploration work or starting construction.

D.1.b. Groundwater Levels

We made groundwater measurements under the conditions reported herein and shown on the exploration logs and interpreted in the text of this report. Note that the observation periods were short, and project planning can expect groundwater levels to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications and other seasonal and annual factors.

D.2. Use of Report

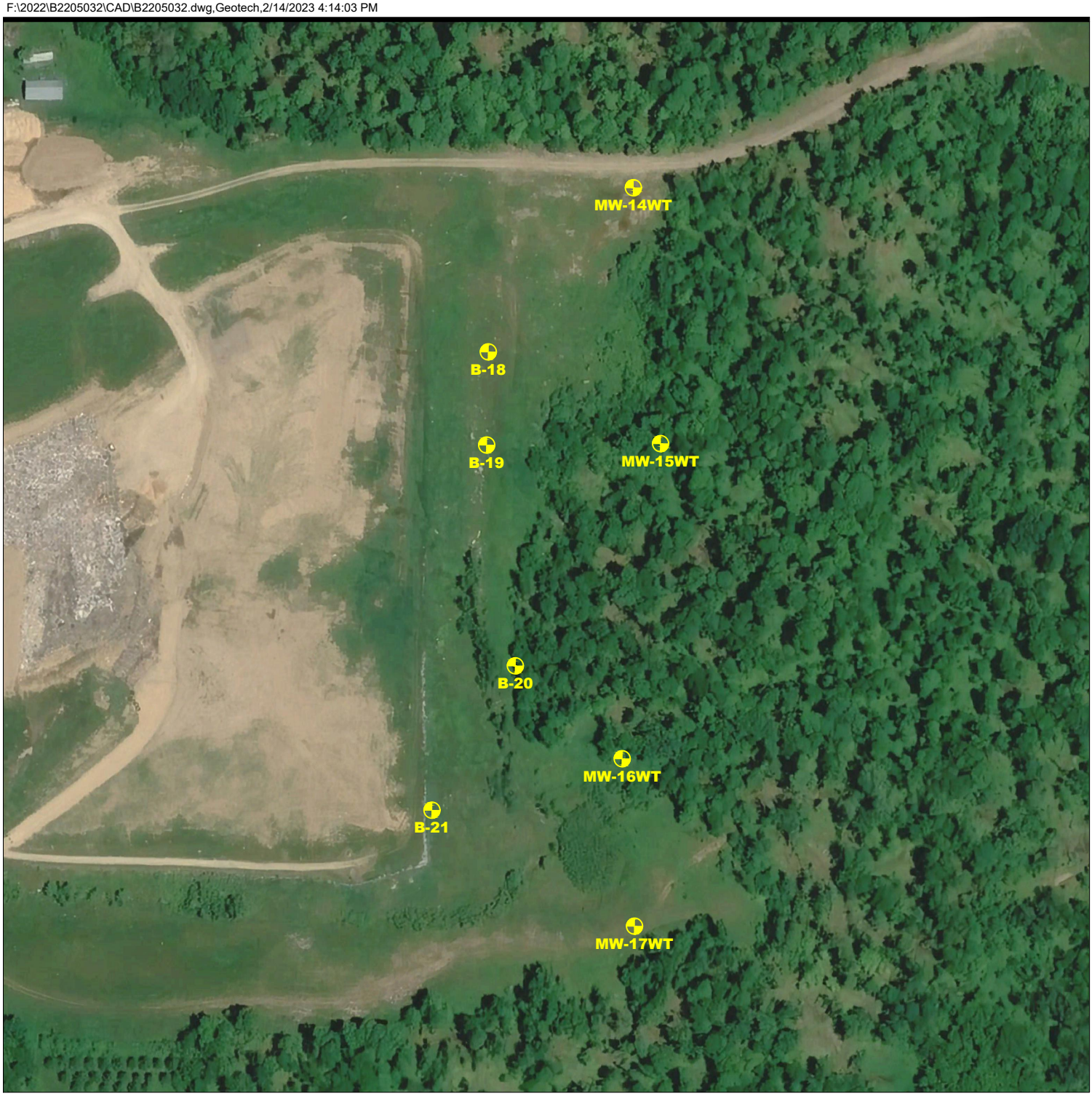
This report is for the exclusive use of the addressed parties. Without written approval, we assume no responsibility to other parties regarding this report. The included information may not be appropriate for other parties or projects.

D.3. Standard of Care

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

Appendix A

F:\2022\B2205032\CAD\B2205032.dwg,Geotech,2/14/2023 4:14:03 PM



DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

N

100' 0 200'

SCALE: 1"= 200'

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11001 Hampshire Avenue S
Minneapolis, MN 55438
952.995.2000
braunintertec.com

Project No:	B2205032
Drawing No:	B2205032
Drawn By:	JAG
Date Drawn:	2/14/23
Checked By:	BW
Last Modified:	2/14/23

Vernon County Landfill Upgrades

53705 County Road LF

Viroqua, Wisconsin

Soil Boring Location Sketch

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **B-18**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164513 EASTING: 715479
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/19/22 END DATE: 09/19/22
SURFACE ELEVATION: 1239.0 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1238.0		LEAN CLAY with SAND (CL), trace roots, brown, moist (TOPSOIL FILL)				20	LL=38, PL=19, PI=19
1.0		FILL: FAT CLAY (CH), orangish brown to tan, moist		2-3-4 (7) 7"		27	LL=64, PL=24, PI=40
1234.5							
4.5		FILL: SANDY FAT CLAY (CH), medium-grained, trace Gravel, orangish brown, moist	5	2-3-3 (6) 8"		27	LL=51, PL=19, PI=32
1232.5							
6.5		FILL: POORLY GRADED SAND (SP), fine to medium-grained, orangish brown, moist		3-7-8 (15) 14"		10	
1230.0							
9.0		FILL: CLAYEY SAND (SC), orangish brown with black, moist	10	2-7-9 (16) 14"		15	LL=39, PL=15, PI=24
1227.5							
11.5		FILL: FAT CLAY with SAND (CH), brown and reddish brown, moist		6-6-5 (11) 16"		27	LL=72, PL=23, PI=49
1225.5							
13.5		CLAYEY SAND (SC), brown, moist, very stiff (ALLUVIUM)	15	5-8-8 (16) 16"		20	
1222.5							
16.5		FAT CLAY (CH), trace Gravel, reddish brown, moist, stiff (RESIDUUM)		3-3-12 (15) 12"		16	
			20	14-12-10 (22) 14"			
1216.0							
23.0		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split-spoon sampler.	25	24-50/5" (REF) 12"			
			30				No recovery
1208.0							
31.0		END OF BORING		50/1" (REF)			Water not observed while drilling.
		Boring then grouted					

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **B-19**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164380 EASTING: 715477
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/19/22 END DATE: 09/19/22
SURFACE ELEVATION: 1233.3 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1232.3		FAT CLAY with SAND (CH), brown, moist (TOPSOIL FILL)					LL=50, PL=17, PI=33
1.0		FILL: SANDY FAT CLAY with GRAVEL (CH), grayish brown, moist		4-7-4 (11) 10"		16	LL=52, PL=19, PI=33
1229.3							
4.0		FILL: SANDY FAT CLAY (CH), brown and red, moist	5	2-3-2 (5) 10"		44	
				4-2-2 (4) 12"		53	
			10	2-2-2 (4) 14"		54	
1221.8							
11.5		FILL: CLAYEY GRAVEL (GC), fine to coarse-grained, dark brown and gray, moist		1-2-1 (3) 6"		33	
			15	1-1-1 (2) 8"		40	
1216.8							
16.5		FILL: FAT CLAY (CH), dark brown, moist		1-1-2 (3) 14"		57	LL=105, PL=34, PI=71
			20	0-1-5 (6) 6"		57	
1210.3							
23.0		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as 'Silty Sand (SM)' in our split-spoon sampler.	25	50/4" (REF) 4"			
			30				
1202.3							
31.0		END OF BORING Boring then grouted		50/1" (REF)			Water not observed while drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **B-20**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164064 EASTING: 715518
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/19/22 END DATE: 09/19/22
SURFACE ELEVATION: 1215.8 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1214.8		SANDY FAT CLAY (CH), trace roots, dark brown, moist (TOPSOIL FILL)					LL=58, PL=16, PI=42
1.0		FILL: LEAN CLAY with GRAVEL (CL), brown, moist		10-4-5 (9) 12"		19	
			5	3-4-6 (10) 12"		27	
1209.3							
6.5		FILL: SANDY FAT CLAY (CH), brown, moist		2-3-6 (9) 12"		33	
1206.8							
9.0		FILL: CLAYEY SAND with GRAVEL (SC), dark brown and black, moist	10	2-12-11 (23) 12"		15	
1204.3							
11.5		FILL: SANDY FAT CLAY (CH), dark brown and gray, moist		3-4-5 (9) 12"		30	
			15	2-1-2 (3) 14"		46	
1199.3							
16.5		FILL: SANDY FAT CLAY (CH), reddish brown and black, moist		5-4-4 (8) 16"		39	
			20	4-7-10 (17) 16"			
1194.8							
21.0		POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, tan, moist, medium dense (RESIDUUM)					
1192.8							
23.0		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split-spoon sampler.	25	50/3" (REF) 3"			
			30	14-18-50/5" (REF) 10"			
1184.8							
31.0		END OF BORING Boring then grouted					Water not observed while drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **B-21**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163857 EASTING: 715398
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/19/22 END DATE: 09/19/22
SURFACE ELEVATION: 1226.1 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1224.9		FAT CLAY with SAND (CH), trace roots, dark brown, moist (TOPSOIL FILL)					LL=67, PL=19, PI=48
1.3		FILL: FAT CLAY with SAND (CH), trace roots, brown, moist		2-2-3 (5) 8"		24	LL=50, PL=16, PI=34
1222.1							
4.0		FILL: FAT CLAY (CH), medium to coarse-grained, trace Gravel, brown, moist	5	1-1-2 (3) 8"		25	
1219.6							
6.5		FILL: SANDY SILT (ML), trace roots, dark brown, moist		1-4-8 (12) 12"		19	
1217.1							
9.0		FILL: LEAN CLAY (CL), trace Gravel, dark brown, moist	10	3-6-7 (13) 12"		17	LL=36, PL=18, PI=18
1214.6							
11.5		FILL: LEAN CLAY (CL), trace organic, dark brown, moist		3-7-8 (15) 14"		19	LL=36, PL=22, PI=14
1211.6							
14.5		FILL: LEAN CLAY (CL), trace Sand, brown, moist	15	2-3-5 (8) 10"		20	
				4-6-9 (15) 14"		18	LL=36, PL=18, PI=18
			20	5-5-7 (12) 12"		19	LL=40, PL=19, PI=21
1203.1							
23.0		FILL: LEAN CLAY (CL), gray to brown, moist	25	9-7-8 (15) 12"		19	
			30	4-6-10 (16) 14"		18	LL=33, PL=20, PI=13
1195.1							
31.0		END OF BORING Boring then grouted					Water not observed while drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-14WT**
LOCATION: See attached sketch. Offset 5 feet
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164748 EASTING: 715687
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/26/22 END DATE: 08/26/22
SURFACE ELEVATION: 1247.2 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1246.2		LEAN CLAY (CL), fine to medium-grained, brown, moist (TOPSOIL FILL)					
1.0		FILL: LEAN CLAY (CL), brown, moist		3-6-7 (13) 18"			
1243.2							
4.0		FILL: CLAYEY SAND (SC), brown, moist	5	4-7-7 (14) 18"			
1240.6							
6.5		FILL: SANDY FAT CLAY (CH), fine to coarse-grained, brownish red, moist		4-3-6 (9) 18"		37	LL=64, PL=42, PI=22
			10	8-6-11 (17) 6"			
1235.6							
11.5		FILL: SILTY CLAY (CL-ML), fine to medium-grained, light gray, moist		3-4-8 (12) 16"			
1233.2							
14.0		FILL: LEAN CLAY (CL), reddish brown, moist	15	3-5-6 (11) 16"			
1230.6							
16.5		FILL: CLAYEY SAND (SC), brown, moist		14-12-8 (20) 18"			
1228.2							
19.0		SILTY SAND (SM), orangish brown, moist, medium dense (ALLUVIUM)	20	6-8-12 (20) 18"			
1224.2							
23.0		LEAN CLAY (CL), fine to coarse-grained, brown, moist, very stiff (RESIDUUM)	25	4-9-11 (20) 16"			Groundwater not observed above mud rotary drilling depth
			30	10-50/4" (REF)			Began mud rotary drilling at 30 feet

Continued on next page

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-14WT**
LOCATION: See attached sketch. Offset 5 feet
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164748 EASTING: 715687
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/26/22 END DATE: 08/26/22
SURFACE ELEVATION: 1247.2 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		LEAN CLAY (CL), fine to coarse-grained, brown, moist, very stiff (RESIDUUM)	35	50/0" (REF)			No Recovery
1210.2 37.0		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, highly weathered to decomposed, moderately hard	40	8 / 44	1 9 15 10 10		Run 1
1205.6 41.5		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, retrieved as "Silty Sand (SM)" in our split-spoon sampler	45 50	50/0" (REF) 50/5" (REF)			
1196.6 50.5		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, slightly weathered, moderately hard to hard	55 60	2" / 16 / 30	1 1 1 1 2 1 3 3		Run 2
1186.6 60.5		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, slightly weathered, moderately hard to hard	65		1 1 8 6 1 4 5		Run 3

Continued on next page

RQD % | Recovery % | Drilling Rate (min/ft) | Bit Pressure (psi) | Water Pressure (psi) | Water Return % | Remarks

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LOG OF CORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-14WT**
LOCATION: See attached sketch. Offset 5 feet
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164748 EASTING: 715687
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/26/22 END DATE: 08/26/22
SURFACE ELEVATION: 1247.2 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	RQD %	Recovery %	Drilling Rate (min/ft)	Bit Pressure (psi)	Water Pressure (psi)	Water Return %	Remarks
1178.6						10				
68.5		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, slightly weathered, moderately hard to hard				2				Run 4
70		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, slightly weathered, moderately hard to hard								Core barrel jammed at 68 1/2 feet. Stepped out 5 feet, drilled to 68 feet and continued mud rotary drilling
75										
80										
85										
90										Permanent monitoring well installed with screen set from 90 to 105 feet
95										
100										

Continued on next page

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LOG OF CORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-14WT**
LOCATION: See attached sketch. Offset 5 feet
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164748 EASTING: 715687
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/26/22 END DATE: 08/26/22
SURFACE ELEVATION: 1247.2 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	RQD %	Recovery %	Drilling Rate (min/ft)	Bit Pressure (psi)	Water Pressure (psi)	Water Return %	Remarks
		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, slightly weathered, moderately hard to hard								
1138.2										
109.0		END OF CORING								Water observed at 100.7 feet while drilling. Water observed at 100.0 feet when rechecked 24 hours after drilling.

105
110
115
120
125
130
135

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-15WT**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164382 EASTING: 715726
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/26/22 END DATE: 09/26/22
SURFACE ELEVATION: 1220.6 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1219.6		CLAYEY SAND (SC), trace roots, brown, moist (TOPSOIL FILL)					
1.0		FILL: SANDY LEAN CLAY (CL), trace Gravel, orangish brown, moist		5-7-6 (13) 14"			
			5	6-5-6 (11) 4"			
1214.6							
6.0		FILL: FAT CLAY (CH), with Sand Layers, orangish brown, moist		5-4-5 (9) 16"			
1211.6							
9.0		FILL: CLAYEY SAND (SC), brown, moist	10	6-6-22 (28) 14"			
1209.1							
11.5		FILL: FAT CLAY (CH), with Clayey Sand Layers, dark brown to reddish brown, moist		3-4-5 (9) 14"			
			15	3-3-4 (7) 16"			Groundwater not observed above mud rotary depth
				2-4-4 (8) 18"		46	LL=109, PL=73, PI=36
1200.6			20	2-4-6 (10) 18"			Began mud rotary drilling at 20 feet
20.0		SANDY FAT CLAY (CH), with Poorly Graded Sand layers, brown, moist, stiff (ALLUVIUM)					
1198.1							
22.5		FAT CLAY (CH), trace Gravel, dark brown, moist, stiff to very stiff (ALLUVIUM)					
			25	2-6-9 (15) 16"			
			30	9-8-4 (12) 16"			

Continued on next page

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-15WT**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164382 EASTING: 715726
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/26/22 END DATE: 09/26/22
SURFACE ELEVATION: 1220.6 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		FAT CLAY (CH), trace Gravel, dark brown, moist, stiff to very stiff (ALLUVIUM)	35	2-1-1 (2) 14"			
1182.6							
38.0		SANDY SILT (ML), with Clay seams, tan to gray, moist, very dense (RESIDUUM)	40	38-17-50/4" (REF) 12"			
			45	10-15-50/2" (REF) 14"			
1173.1							
47.5		SILTY SAND (SM), fine to medium-grained, orangish brown, moist, very dense (RESIDUUM)	50	25-45-50/2" (REF) 12"			
			55				
			60	32-27-24 (51) 14"			
1158.1							
62.5		CLAYEY SAND (SC), orangish brown, moist, stiff (RESIDUUM)	65	6-5-10 (15) 14"			
1153.1		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split-spoon sampler.					
67.5							

Continued on next page

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-15WT**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 164382 EASTING: 715726
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/26/22 END DATE: 09/26/22
SURFACE ELEVATION: 1220.6 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split-spoon sampler.					
70			M	50/2" (REF) 2"			Permanent monitoring well installed with screen set from 73 to 83 feet
75							
80							
85							
90							
95							
1121.6							
99.0		END OF BORING					Water not observed while drilling.
100							

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-16**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163940 EASTING: 715674
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/21/22 END DATE: 08/23/22
SURFACE ELEVATION: 1184.8 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Dirt/Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1183.8		LEAN CLAY (CL), brown, moist (TOPSOIL)					
1.0		FILL: LEAN CLAY (CL), brown, moist		2-2-2 (4) 0"			No recovery
			5	1-1-2 (3) 10"			
				2-3-3 (6) 14"			LL=43, PL=21, PI=22
1175.8				TW			
9.0		LEAN CLAY (CL), brown, moist, medium (LOESS)	10	TW		24	LL=37, PL=16, PI=21
				2-3-3 (6) 14"			
1170.8							
14.0		CLAYEY SAND with GRAVEL (SC), fine to coarse-grained, brown and yellow, moist, stiff (ALLUVIUM)	15	8-7-6 (13) 14"			
				4-4-6 (10) 18"			
			20	4-5-6 (11) 18"			
			25	4-4-5 (9) 14"		18	LL=41, PL=24, PI=17
			30	8-7-5 (12) 8"			
1151.8		CLAYEY GRAVEL (GC), fine to coarse-grained, brown, moist, medium dense to very dense (RESIDUUM)					
33.0							

Continued on next page

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-16**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163940 EASTING: 715674
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/21/22 END DATE: 08/23/22
SURFACE ELEVATION: 1184.8 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Dirt/Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		CLAYEY GRAVEL (GC), fine to coarse-grained, brown, moist, medium dense to very dense (RESIDUUM)	35	22-28-30 (58) 8"			
			40	6-15-42 (57)			
			45	5-8-16 (24) 16"			Groundwater not observed above mud rotary depth
1136.8							
48.0		SILTY GRAVEL (GM), fine to coarse-grained, brown, moist to wet, dense to very dense (RESIDUUM)	50	8-10-26 (36) 16"			Began mud rotary drilling at 50 feet Groundwater perched at 50 feet, static at 68 feet
			55	50/5" (REF) 4"			
			60	15-50/5" (REF) 8"			
1120.8							
64.0		CLAYEY SAND with GRAVEL (SC), fine to coarse-grained, tan, wet, stiff (RESIDUUM)	65	35-8-3 (11) 18"			Adjacent well MW-16WT installed screen from 65 to 75 feet
1116.8							
68.0		Continued on next page					

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-16**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163940 EASTING: 715674
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 08/21/22 END DATE: 08/23/22
SURFACE ELEVATION: 1184.8 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Dirt/Open Cut WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in split-spoon sampler	70	50/3" (REF) 3"			
			75	3-9-25 (34) 18"			
	▽		80	50/1" (REF) 1"			
			85	50/0" (REF) 0"			
			90	50/4" (REF) 2"			Permanent monitoring well installed with screen set from 92 to 97 feet
			95	50/1" (REF) 1"			
1086.8 98.0		END OF BORING	100				Water not observed while drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-17WT**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163691 EASTING: 715688
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/22/22 END DATE: 09/22/22
SURFACE ELEVATION: 1196.4 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
1195.4		SANDY FAT CLAY (CH), trace roots, brown, moist (TOPSOIL FILL)					
1.0		FILL: CLAYEY SAND with GRAVEL (SC), brown, moist		5-9-6 (15) 14"			
			5	10-28-20 (48) 12"		20	LL=59, PL=40, PI=19
1190.4							
6.0		FILL: CLAYEY SAND (SC), trace Gravel, brown, moist		14-10-12 (22) 14"		17	LL=39, PL=27, PI=12
			10	10-10-10 (20) 16"		16	LL=41, PL=29, PI=12
1184.9							
11.5		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, brown, moist		14-14-25 (39) 14"			
			15	24-40-40 (80) 14"			
1179.9							
16.5		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, with thin clay layers, light brown, moist		15-9-10 (19) 16"			
			20	7-14-34 (48) 16"			Began mud rotary drilling at 20 feet
			25	12-14-16 (30) 16"			
1167.9							
28.5		SILTY SAND (SM), fine to medium-grained, orangish brown, moist, medium dense (ALLUVIUM)	30	4-5-11 (16) 14"			

Continued on next page

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-17WT**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163691 EASTING: 715688
DRILLER: E. Rislov LOGGED BY: T. Felker START DATE: 09/22/22 END DATE: 09/22/22
SURFACE ELEVATION: 1196.4 ft RIG: 8505 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		SILTY SAND (SM), fine to medium-grained, orangish brown, moist, medium dense (ALLUVIUM)	35	10-15-32 (47) 14"			
1158.9							
37.5		CLAYEY SAND (SC), with Silt, brown, moist, stiff (ALLUVIUM)	40	8-6-6 (12) 12"			
1153.4							
43.0		SANDY SILT (ML), brown, moist, very dense (RESIDUUM)	45	35-50/2" (REF) 6"			
1148.4							
48.0		SANDY SILT (ML), fine to medium-grained, brown, moist, medium dense (RESIDUUM)	50	10-10-17 (27) 12"			
			55	10-14-16 (30) 12"			
			60	14-10-10 (20) 10"			
1133.4							
63.0		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split-spoon sampler.	65	50/1" (REF) 1"			

Continued on next page

BRAUN INTERTEC
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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2205032
Factual Report
Vernon County Landfill
S3705 County Road LF
Viroqua, Wisconsin

BORING: **MW-17WT**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Wisconsin CRS Vernon (US Feet)
NORTHING: 163691 EASTING: 715688

DRILLER:	E. Rislov	LOGGED BY:	T. Felker	START DATE:	09/22/22
SURFACE ELEVATION:	1196.4 ft	RIG: 8505	METHOD: 3 1/4" HSA	SURFACING:	Grass
END DATE:	09/22/22	WEATHER:	Sunny		

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split-spoon sampler.					
	▽						Permanent monitoring well installed with screen set from 77 to 87 feet
1103.4 93.0		END OF BORING					

70 75 80 85 90 95 100

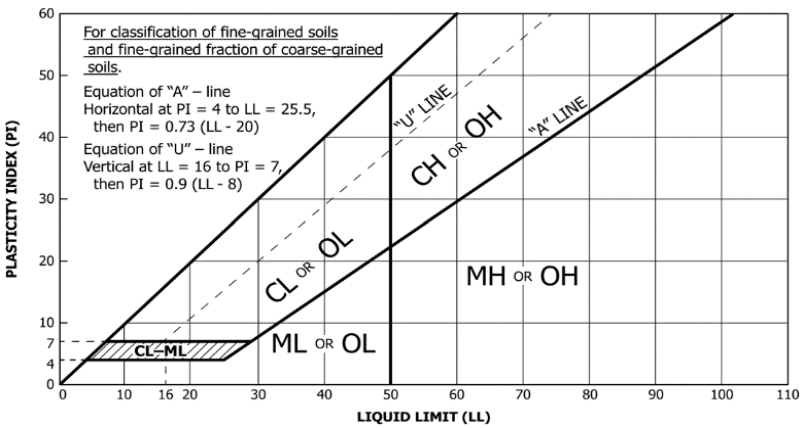
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Descriptive Terminology of Soil

Based on Standards ASTM D2487/2488
(Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
				Group Symbol	Group Name[B]
Coarse-grained Soils (more than 50% retained on No. 200 sieve)	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5% fines[C])	$C_u \geq 4$ and $1 \leq C_c \leq 3$[D]	GW	Well-graded gravel[E]
			$C_u < 4$ and/or ($C_c < 1$ or $C_c > 3$)[D]	GP	Poorly graded gravel[E]
		Gravels with Fines (More than 12% fines[C])	Fines classify as ML or MH	GM	Silty gravel[E F G]
			Fines Classify as CL or CH	GC	Clayey gravel[E F G]
	Sands (50% or more coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% fines[H])	$C_u \geq 6$ and $1 \leq C_c \leq 3$[D]	SW	Well-graded sand[I]
			$C_u < 6$ and/or ($C_c < 1$ or $C_c > 3$)[D]	SP	Poorly graded sand[I]
		Sands with Fines (More than 12% fines[H])	Fines classify as ML or MH	SM	Silty sand[F G I]
			Fines classify as CL or CH	SC	Clayey sand[F G I]
Fine-grained Soils (50% or more passes the No. 200 sieve)	Silts and Clays (Liquid limit less than 50)	Inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean clay[K L M]
			PI < 4 or plots below "A" line[J]	ML	Silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OL	Organic clay[K L M N] / Organic silt[K L M O]
	Silts and Clays (Liquid limit 50 or more)	Inorganic	PI plots on or above "A" line	CH	Fat clay[K L M]
			PI plots below "A" line	MH	Elastic silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OH	Organic clay[K L M P] / Organic silt[K L M Q]
Highly Organic Soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

A. Based on the material passing the 3-inch (75-mm) sieve.
B. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
C. Gravels with 5 to 12% fines require dual symbols:
   GW-GM well-graded gravel with silt
   GW-GC well-graded gravel with clay
   GP-GM poorly graded gravel with silt
   GP-GC poorly graded gravel with clay
D. $C_u = D_{60} / D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
E. If soil contains ≥ 15% sand, add "with sand" to group name.
F. If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
G. If fines are organic, add "with organic fines" to group name.
H. Sands with 5 to 12% fines require dual symbols:
   SW-SM well-graded sand with silt
   SW-SC well-graded sand with clay
   SP-SM poorly graded sand with silt
   SP-SC poorly graded sand with clay
I. If soil contains ≥ 15% gravel, add "with gravel" to group name.
J. If Atterberg limits plot in hatched area, soil is CL-ML, silty clay.
K. If soil contains 15 to < 30% plus No. 200, add "with sand" or "with gravel", whichever is predominant.
L. If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.
M. If soil contains ≥ 30% plus No. 200 predominantly gravel, add "gravelly" to group name.
N. PI ≥ 4 and plots on or above "A" line.
O. PI < 4 or plots below "A" line.
P. PI plots on or above "A" line.
Q. PI plots below "A" line.



Particle Size Identification

Boulders..... over 12"
Cobbles..... 3" to 12"
Gravel
  Coarse..... 3/4" to 3" (19.00 mm to 75.00 mm)
  Fine..... No. 4 to 3/4" (4.75 mm to 19.00 mm)
Sand
  Coarse..... No. 10 to No. 4 (2.00 mm to 4.75 mm)
  Medium..... No. 40 to No. 10 (0.425 mm to 2.00 mm)
  Fine..... No. 200 to No. 40 (0.075 mm to 0.425 mm)
Silt..... No. 200 (0.075 mm) to .005 mm
Clay..... < .005 mm

Relative Proportions[L, M]

trace..... 0 to 5%
little..... 6 to 14%
with..... ≥ 15%

Inclusion Thicknesses

lens..... 0 to 1/8"
seam..... 1/8" to 1"
layer..... over 1"

Apparent Relative Density of Cohesionless Soils

Very loose ..... 0 to 4 BPF
Loose ..... 5 to 10 BPF
Medium dense..... 11 to 30 BPF
Dense..... 31 to 50 BPF
Very dense..... over 50 BPF

Consistency of Cohesive Soils	Blows Per Foot	Approximate Unconfined Compressive Strength
Very soft	0 to 1 BPF	< 0.25 tsf
Soft	2 to 4 BPF	0.25 to 0.5 tsf
Medium	5 to 8 BPF	0.5 to 1 tsf
Stiff	9 to 15 BPF	1 to 2 tsf
Very Stiff	16 to 30 BPF	2 to 4 tsf
Hard	over 30 BPF	> 4 tsf

Moisture Content:

Dry: Absence of moisture, dusty, dry to the touch.
Moist: Damp but no visible water.
Wet: Visible free water, usually soil is below water table.

Drilling Notes:

Blows/N-value: Blows indicate the driving resistance recorded for each 6-inch interval. The reported N-value is the blows per foot recorded by summing the second and third interval in accordance with the Standard Penetration Test, ASTM D1586.

Partial Penetration: If the sampler could not be driven through a full 6-inch interval, the number of blows for that partial penetration is shown as #/x" (i.e. 50/2"). The N-value is reported as "REF" indicating refusal.

Recovery: Indicates the inches of sample recovered from the sampled interval. For a standard penetration test, full recovery is 18", and is 24" for a thinwall/shelby tube sample.

WOH: Indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WOR: Indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

Water Level: Indicates the water level measured by the drillers either while drilling (▽), at the end of drilling (▼), or at some time after drilling (▼).

Laboratory Tests

DD	Dry density, pcf	**OC**	Organic content, %	**LL**	Liquid limit
WD	Wet density, pcf	**q_p**	Pocket penetrometer strength, tsf	**PL**	Plastic limit
P200	% Passing #200 sieve	**MC**	Moisture content, %	**PI**	Plasticity index
		q_U	Unconfined compression test, tsf		

Appendix B

BRAUN INTERTEC
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Geotechnical Testing

Various ASTM

12/14/2022

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Metafield ID: 498857
Sampled By: Drill Crew
Sample Date: 11/29/2022
Received Date: 12/14/2022
Lab: 11001 Hampshire Ave S, Bloomington, MN
Completed Date: 12/14/2022
Tested By: Seokaran, Kanhai

Laboratory Results Summary

Boring	Sample	Depth (ft)	MC (%)	Wash Loss (%)	LL	PL	PI	Organic Content %	Dry Density (pcf)	Resistivity (ohm-cm)	Q_u (tsf)	Specific Gravity
B-18		7.0	10.3									
B-18		14.5	19.5									
B-18		17.0	15.9									
B-19		4.5	43.8									
B-19		7.0	52.5									
B-19		9.5	54.0									
B-19		12.0	33.4									
B-19		14.5	39.9									
B-19		19.5	57.2									
B-20		2.0	19.2									
B-20		4.5	27.1									
B-20		7.0	33.3									
B-20		9.5	15.0									
B-20		12.0	30.0									
B-20		14.5	46.1									
B-20		17.0	39.3									
B-21		4.5	25.4									
B-21		7.0	18.6									
B-21		14.5	20.2									
B-21		24.5	18.9									
MW-16	TW	10.0			37	21	16					
B-19		0.0			50	17	33					
B-21		0.0			67	19	48					

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BRAUN INTERTEC
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11001 Hampshire Avenue S
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Phone: 952-995-2000

Geotechnical Testing

Various ASTM

12/14/2022

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Boring	Sample	Depth (ft)	MC (%)	Wash Loss (%)	LL	PL	PI	Organic Content %	Dry Density (pcf)	Resistivity (ohm-cm)	Q_u (tsf)	Specific Gravity
MW-16	TW	7.0			43	22	21					
B-19		17.0			105	34	71					
B-20	Bulk	0.0			58	16	42					
B-21		2.0			50	16	34					
B-21		9.5			36	18	18					
B-21		12.0			36	22	14					
B-21		17.0			36	18	18					
B-21		19.5			40	19	21					
B-21		29.5			33	20	13					
MW-14WT		7.0			64	22	42					
MW-15WT		17.0			109	36	73					
MW-16		24.5			41	17	24					
MW-17WT		4.5			59	19	40					
MW-17WT		7.0			39	12	27					
MW-17WT		9.5			41	12	29					
B-18		0.0			38	19	19					
B-18		2.0			64	24	40					
B-18		4.5			51	19	32					
B-18		9.5			39	15	24					
B-18		12.0			72	23	49					
B-19		2.0			52	19	33					

General

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Geotechnical Testing

Various ASTM

12/16/2022

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Metafield ID: 499072

Completed Date: 12/16/2022 **Prepared By:** Streier, Jim

Laboratory Results Summary

Boring	Sample	Depth (ft)	MC (%)	Wash Loss (%)	LL	PL	PI	Organic Content %	Dry Density (pcf)	Resistivity (ohm-cm)	Q_u (tsf)	Specific Gravity
MW-14WT		7.0	36.8									
MW-15WT		17.0	46.0									
MW-16		10.0	24.2									
MW-16		24.5	18.0									
MW-17WT		4.5	19.8									
MW-17WT		7.0	16.8									
MW-17WT		9.5	15.9									
B-18		0.0	19.5									
B-18		2.0	27.1									
B-18		4.5	26.7									
B-18		9.5	15.4									
B-18		12.0	26.5									
B-19		2.0	15.8									
B-19		17.0	57.4									
B-21		2.0	24.2									
B-21		9.5	17.0									
B-21		12.0	18.5									
B-21		17.0	17.9									
B-21		19.5	19.0									
B-21		29.5	18.2									

General

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Geotechnical Testing

Various ASTM

12/16/2022

Client:	**Project:**
Vernon County Solid Waste & Recycling Department S3705 County Road LF Viroqua, WI 54665	B2205032 Vernon County Landfill S3705 County Road LF Viroqua, WI 54665

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Atterberg Limits

ASTM D4318

Report Date: 07/03/2023

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11001 Hampshire Avenue S
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Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522626	**Sampled By:**	Wright, Brandon
Sampling Method:	Project Specified	**Depth (ft):**	0-2
Boring Number:	B-19		
Location Details:	B-19		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/06/2023	**Tested By:**	Streier, Jim

Laboratory Data

Description	Result	Specifications
Liquid Limit:	51	-
Plastic Limit:	18	
Plastic Index:	33	-
Soil Classification:	CH Fat Clay	

General

Results: The test is for informational purposes.

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Atterberg Limits

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Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522628	**Sampled By:**	Wright, Brandon
Sampling Method:	Project Specified	**Depth (ft):**	0-2
Boring Number:	B-20		
Location Details:	B-20		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/06/2023	**Tested By:**	Streier, Jim

Laboratory Data

Description	Result	Specifications
Liquid Limit:	35	-
Plastic Limit:	23	
Plastic Index:	12	-
Soil Classification:	CL SANDY LEAN CLAY	

General

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Hydrometer And Sieve Analysis

ASTM D422

12/16/2022

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

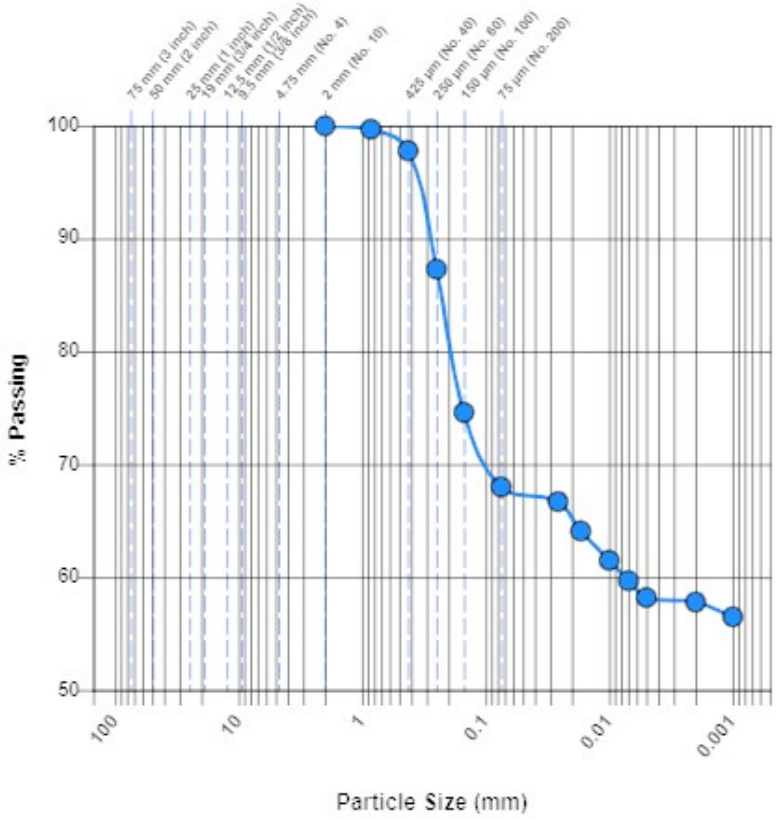
Sample Information

Sample Number:	499074	**Depth (ft):**	7-8.5
Boring Number:	MW-14WT	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.7	-
425 µm (No. 40)	97.8	-
250 µm (No. 60)	87.3	-
150 µm (No. 100)	74.6	-
75 µm (No. 200)	68.0	-
26.2 (µm)	66.7	-
16.7 (µm)	64.1	-
9.7 (µm)	61.5	-
6.9 (µm)	59.7	-
4.9 (µm)	58.2	-
2.4 (µm)	57.8	-
1.0 (µm)	56.5	-



Soil Classification: CH Sandy fat clay

Gravel (%):	0	**Sand (%):**	32.0	**Silt (%):**	9.8	**Clay (%):**	58.2
D_{60} (µm):	7.5						

General

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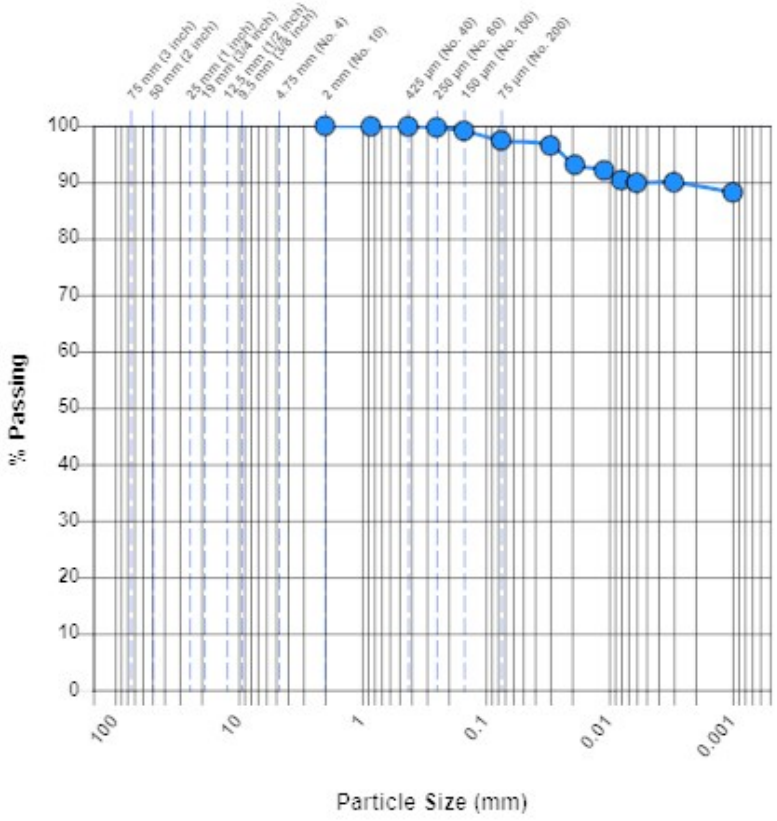
Sample Information

Sample Number:	499075	**Depth (ft):**	17-18.5
Boring Number:	MW-15WT	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.9	-
425 µm (No. 40)	99.9	-
250 µm (No. 60)	99.7	-
150 µm (No. 100)	99.1	-
75 µm (No. 200)	97.4	-
29.8 (µm)	96.5	-
19.0 (µm)	93.1	-
11.0 (µm)	92.1	-
7.8 (µm)	90.4	-
5.5 (µm)	89.9	-
2.7 (µm)	90.0	-
1.2 (µm)	88.2	-



Soil Classification: CH Fat Clay

Gravel (%):	0	**Sand (%):**	2.6	**Silt (%):**	7.5	**Clay (%):**	89.9

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Hydrometer And Sieve Analysis

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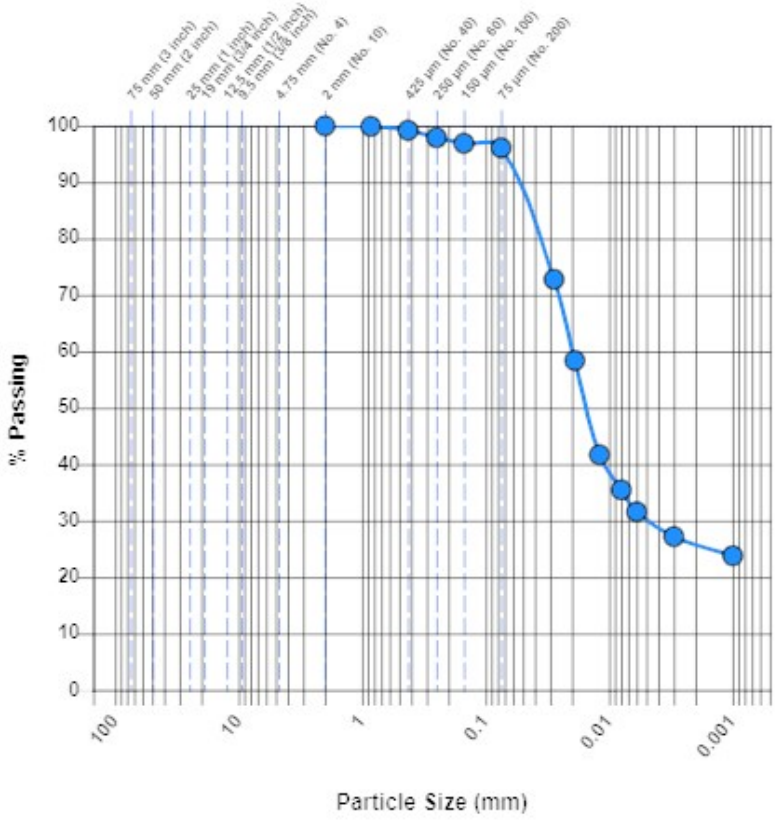
Sample Information

Sample Number:	499076	**Depth (ft):**	10-12
Boring Number:	MW-16	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.9	-
425 µm (No. 40)	99.2	-
250 µm (No. 60)	97.9	-
150 µm (No. 100)	96.9	-
75 µm (No. 200)	96.1	-
28.1 (µm)	72.8	-
18.9 (µm)	58.4	-
11.6 (µm)	41.7	-
8.4 (µm)	35.5	-
6.0 (µm)	31.6	-
3.0 (µm)	27.2	-
1.3 (µm)	23.8	-



Soil Classification: CL Lean clay

Gravel (%):	0	**Sand (%):**	3.9	**Silt (%):**	66.0	**Clay (%):**	30.1
D_{60} (µm):	20.0	**D_{30} (µm):**	4.9				

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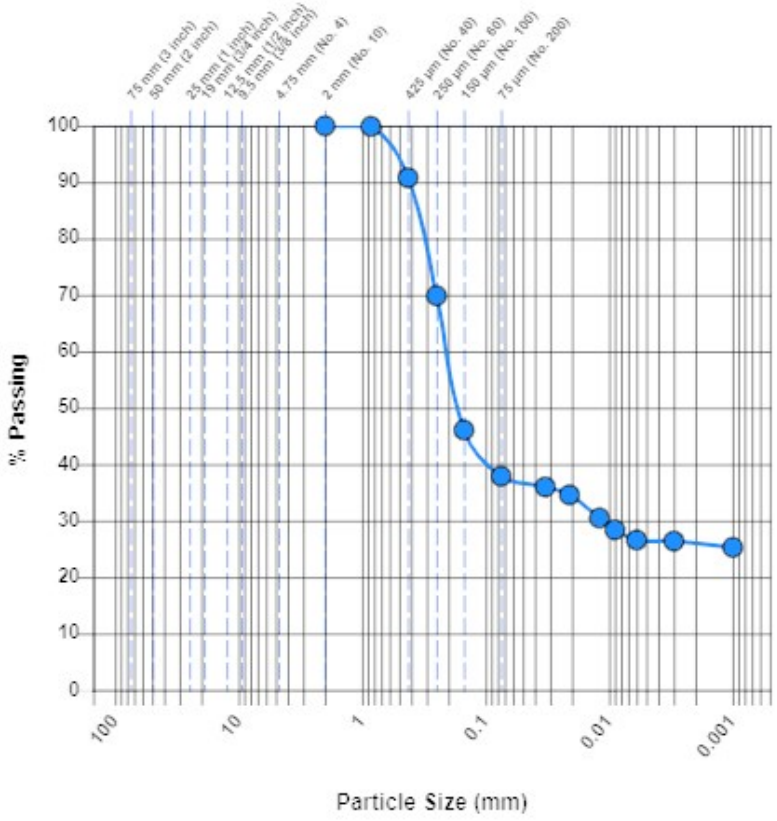
Sample Information

Sample Number:	499077	**Depth (ft):**	24.5-26
Boring Number:	MW-16	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.9	-
425 µm (No. 40)	90.8	-
250 µm (No. 60)	69.9	-
150 µm (No. 100)	46.1	-
75 µm (No. 200)	37.9	-
33.2 (µm)	36.0	-
21.0 (µm)	34.6	-
12.3 (µm)	30.5	-
8.7 (µm)	28.4	-
6.2 (µm)	26.6	-
3.0 (µm)	26.4	-
1.3 (µm)	25.3	-



Soil Classification: SC Clayey sand

Gravel (%):	0	**Sand (%):**	62.1	**Silt (%):**	11.4	**Clay (%):**	26.5
D_{60} (µm):	208.4	**D_{30} (µm):**	11.3				

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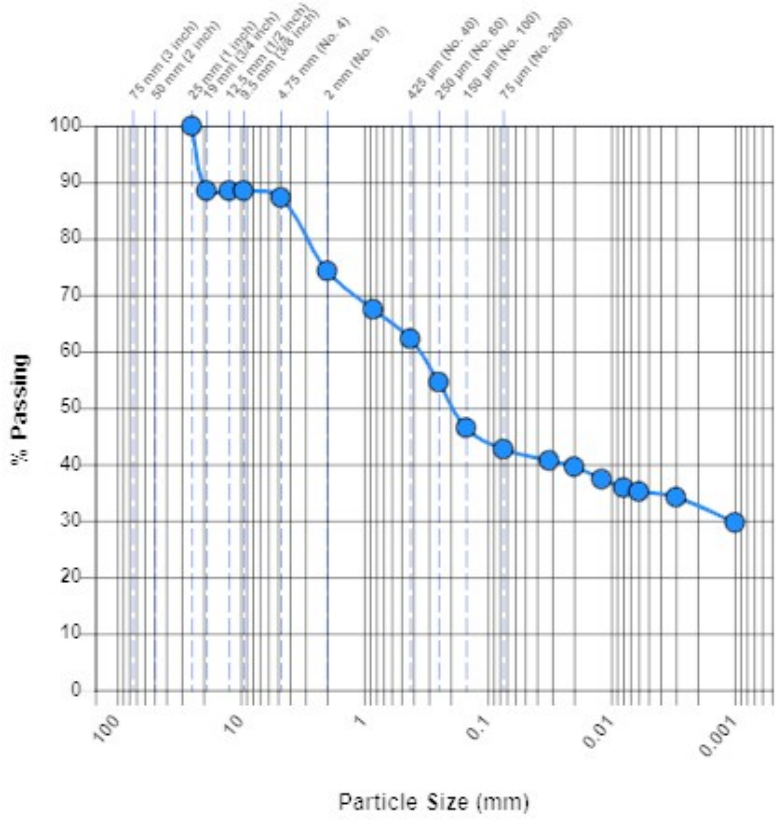
Sample Information

Sample Number:	499079	**Depth (ft):**	4.5-6
Boring Number:	MW-17WT	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
25 mm (1 inch)	100.0	-
19 mm (3/4 inch)	88.5	-
12.5 mm (1/2 inch)	88.5	-
9.5 mm (3/8 inch)	88.5	-
4.75 mm (No. 4)	87.3	-
2 mm (No. 10)	74.3	-
850 µm (No. 20)	67.5	-
425 µm (No. 40)	62.3	-
250 µm (No. 60)	54.6	-
150 µm (No. 100)	46.5	-
75 µm (No. 200)	42.7	-
32.1 (µm)	40.7	-
20.4 (µm)	39.6	-
11.8 (µm)	37.4	-
8.4 (µm)	35.9	-
5.9 (µm)	35.2	-
2.9 (µm)	34.2	-
1.3 (µm)	29.7	-



Soil Classification: SC Clayey sand

Gravel (%):	12.7	**Sand (%):**	44.6	**Silt (%):**	7.8	**Clay (%):**	34.9
D_{60} (µm):	372.7	**D_{30} (µm):**	1.1				

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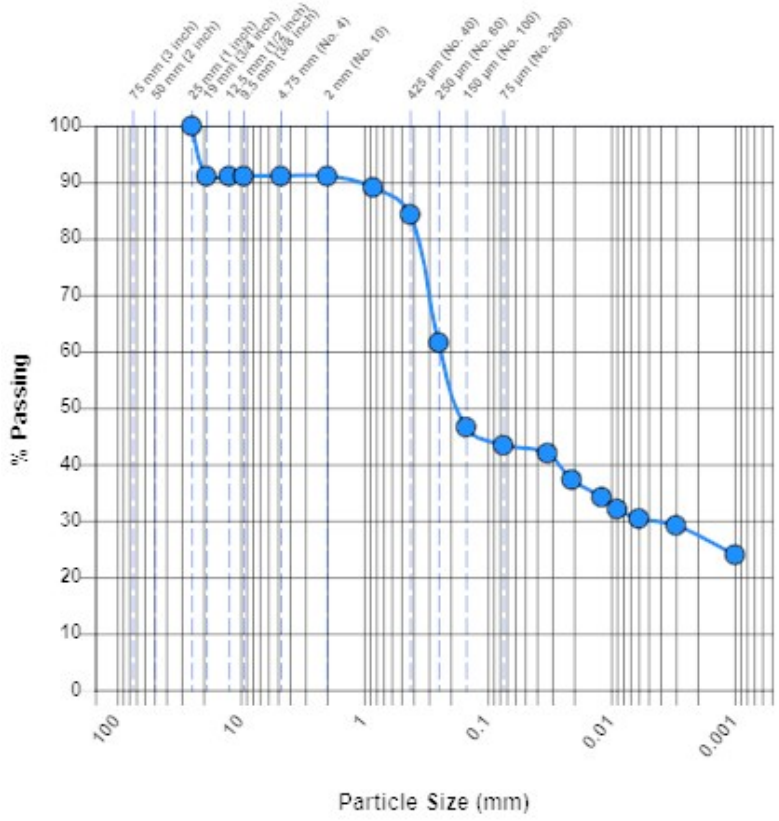
Sample Information

Sample Number:	499080	**Depth (ft):**	7-8.5
Boring Number:	MW-17WT	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
25 mm (1 inch)	100.0	-
19 mm (3/4 inch)	91.1	-
12.5 mm (1/2 inch)	91.1	-
9.5 mm (3/8 inch)	91.1	-
4.75 mm (No. 4)	91.1	-
2 mm (No. 10)	91.1	-
850 µm (No. 20)	89.1	-
425 µm (No. 40)	84.3	-
250 µm (No. 60)	61.6	-
150 µm (No. 100)	46.6	-
75 µm (No. 200)	43.4	-
32.5 (µm)	42.0	-
20.8 (µm)	37.3	-
12.1 (µm)	34.2	-
8.6 (µm)	32.1	-
6.1 (µm)	30.4	-
3.0 (µm)	29.2	-
1.3 (µm)	24.0	-



Soil Classification: SC Clayey sand

Gravel (%):	8.9	**Sand (%):**	47.7	**Silt (%):**	13.4	**Clay (%):**	30.0
D_{60} (µm):	239.3	**D_{30} (µm):**	5.0				

General

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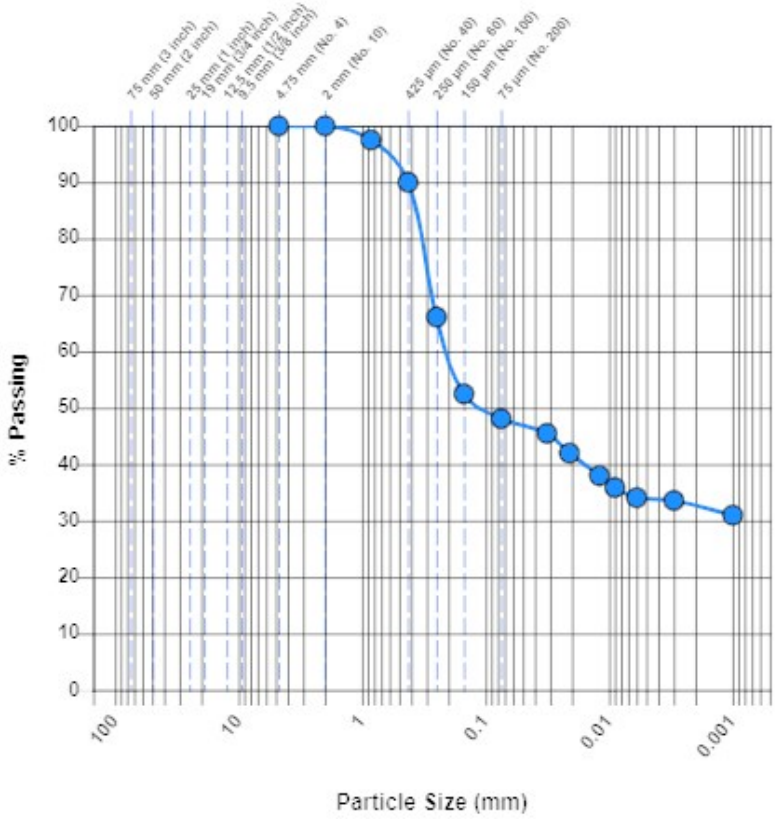
Sample Information

Sample Number:	499082	**Depth (ft):**	9.5-11
Boring Number:	MW-17WT	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
4.75 mm (No. 4)	100.0	-
2 mm (No. 10)	100.0	-
850 µm (No. 20)	97.5	-
425 µm (No. 40)	90.0	-
250 µm (No. 60)	66.1	-
150 µm (No. 100)	52.5	-
75 µm (No. 200)	48.1	-
32.4 (µm)	45.5	-
20.7 (µm)	42.0	-
12.0 (µm)	38.0	-
8.6 (µm)	35.9	-
6.1 (µm)	34.1	-
3.0 (µm)	33.6	-
1.3 (µm)	31.0	-



Soil Classification: SC Clayey sand

Gravel (%):	0.0	**Sand (%):**	51.9	**Silt (%):**	14.2	**Clay (%):**	33.9
D_{60} (µm):	205.1						

General

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Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

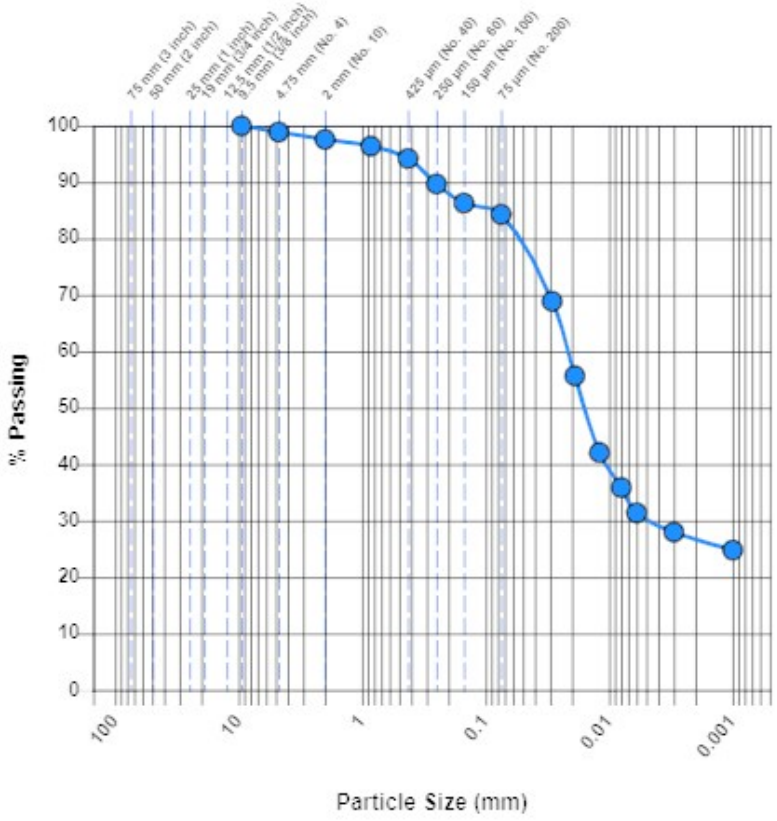
Sample Information

Sample Number:	499084	**Depth (ft):**	0-2
Boring Number:	B-18	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
9.5 mm (3/8 inch)	100.0	-
4.75 mm (No. 4)	98.9	-
2 mm (No. 10)	97.6	-
850 µm (No. 20)	96.4	-
425 µm (No. 40)	94.2	-
250 µm (No. 60)	89.7	-
150 µm (No. 100)	86.3	-
75 µm (No. 200)	84.3	-
29.2 (µm)	68.9	-
19.3 (µm)	55.7	-
11.6 (µm)	42.1	-
8.4 (µm)	35.9	-
6.0 (µm)	31.4	-
3.0 (µm)	28.0	-
1.3 (µm)	24.8	-



Soil Classification: CL Lean clay with sand

Gravel (%):	1.1	**Sand (%):**	14.6	**Silt (%):**	54.0	**Clay (%):**	30.3
D_{60} (µm):	22.3	**D_{30} (µm):**	4.8				

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Hydrometer And Sieve Analysis

ASTM D422

12/16/2022

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

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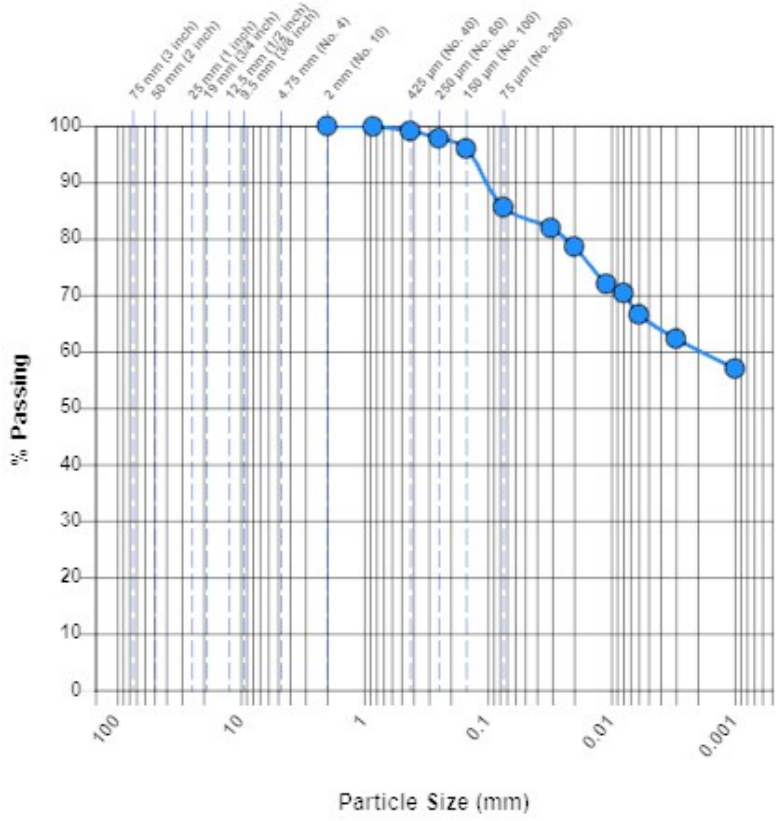
Sample Information

Sample Number:	499085	**Depth (ft):**	2-3.5
Boring Number:	B-18	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.9	-
425 µm (No. 40)	99.1	-
250 µm (No. 60)	97.8	-
150 µm (No. 100)	96.0	-
75 µm (No. 200)	85.6	-
30.6 (µm)	81.9	-
19.5 (µm)	78.6	-
11.4 (µm)	72.0	-
8.1 (µm)	70.4	-
5.7 (µm)	66.6	-
2.8 (µm)	62.3	-
1.3 (µm)	57.0	-



Soil Classification: CH Fat Clay

Gravel (%):	0	**Sand (%):**	14.4	**Silt (%):**	20.4	**Clay (%):**	65.2
D_{60} (µm):	2.1						

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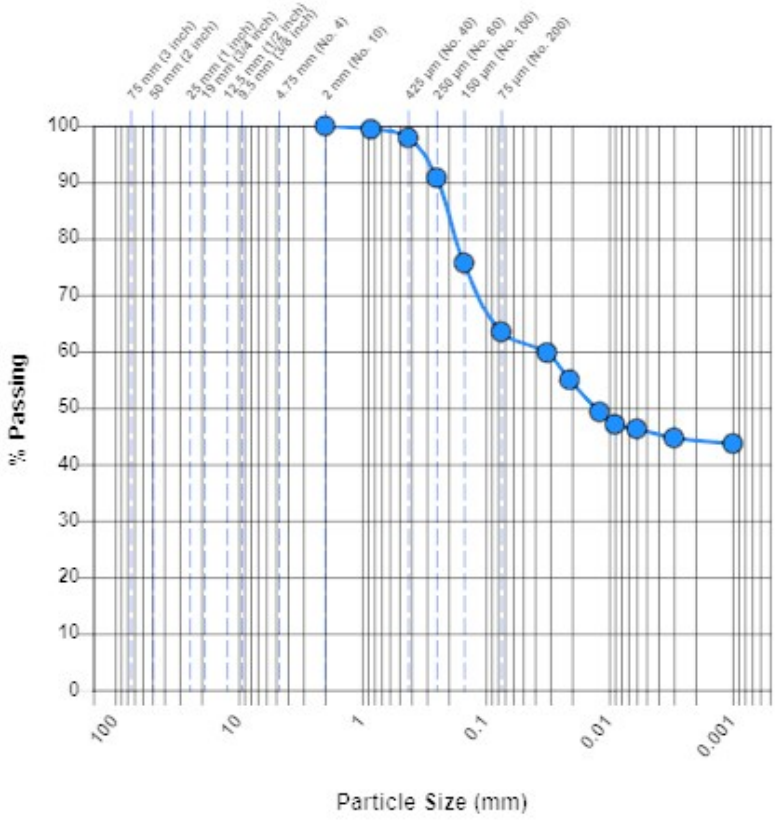
Sample Information

Sample Number:	499086	**Depth (ft):**	4.5-6
Boring Number:	B-18	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.4	-
425 µm (No. 40)	97.9	-
250 µm (No. 60)	90.8	-
150 µm (No. 100)	75.7	-
75 µm (No. 200)	63.5	-
32.4 (µm)	59.8	-
20.7 (µm)	55.0	-
12.1 (µm)	49.3	-
8.6 (µm)	47.1	-
6.0 (µm)	46.3	-
3.0 (µm)	44.7	-
1.3 (µm)	43.7	-



Soil Classification: CH Sandy fat clay

Gravel (%):	0	**Sand (%):**	36.5	**Silt (%):**	17.7	**Clay (%):**	45.8
D_{60} (µm):	34.3						

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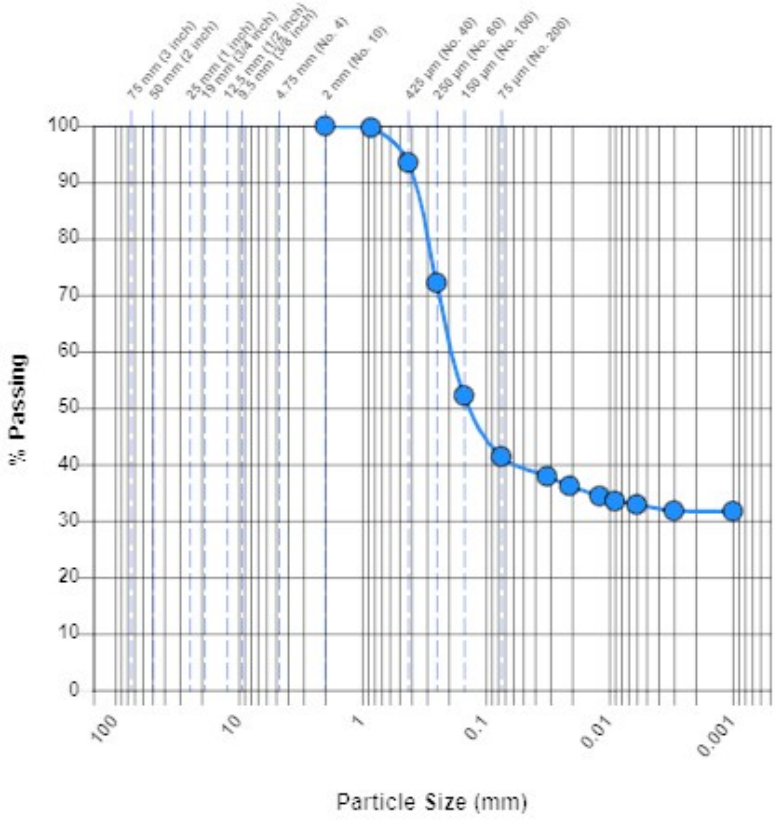
Sample Information

Sample Number:	499088	**Depth (ft):**	9.5-11
Boring Number:	B-18	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.7	-
425 µm (No. 40)	93.5	-
250 µm (No. 60)	72.2	-
150 µm (No. 100)	52.2	-
75 µm (No. 200)	41.4	-
32.3 (µm)	37.9	-
20.6 (µm)	36.2	-
11.9 (µm)	34.4	-
8.5 (µm)	33.5	-
6.0 (µm)	32.9	-
2.9 (µm)	31.8	-
1.3 (µm)	31.7	-



Soil Classification: SC Clayey sand

Gravel (%):	0	**Sand (%):**	58.6	**Silt (%):**	8.9	**Clay (%):**	32.5

D_{60} (µm): 189.0

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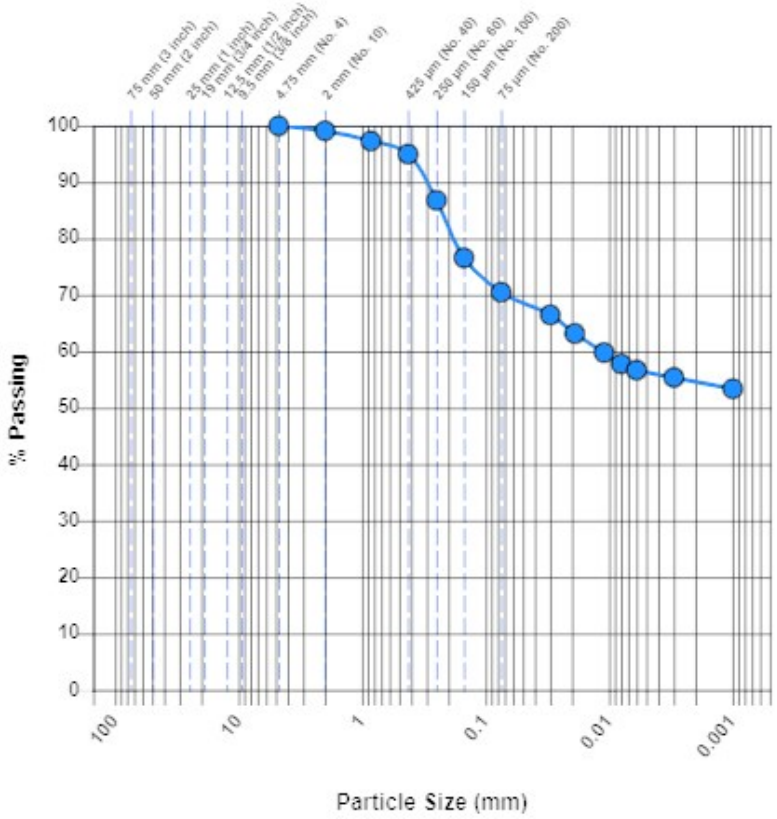
Sample Information

Sample Number:	499090	**Depth (ft):**	12-13.5
Boring Number:	B-18	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
4.75 mm (No. 4)	100.0	-
2 mm (No. 10)	99.1	-
850 µm (No. 20)	97.3	-
425 µm (No. 40)	95.0	-
250 µm (No. 60)	86.8	-
150 µm (No. 100)	76.6	-
75 µm (No. 200)	70.5	-
30.1 (µm)	66.5	-
19.2 (µm)	63.2	-
11.2 (µm)	59.8	-
8.0 (µm)	57.8	-
5.6 (µm)	56.7	-
2.8 (µm)	55.4	-
1.2 (µm)	53.4	-



Soil Classification: CH Fat clay with sand

Gravel (%):	0.0	**Sand (%):**	29.5	**Silt (%):**	14.2	**Clay (%):**	56.3
D_{60} (µm):	11.5						

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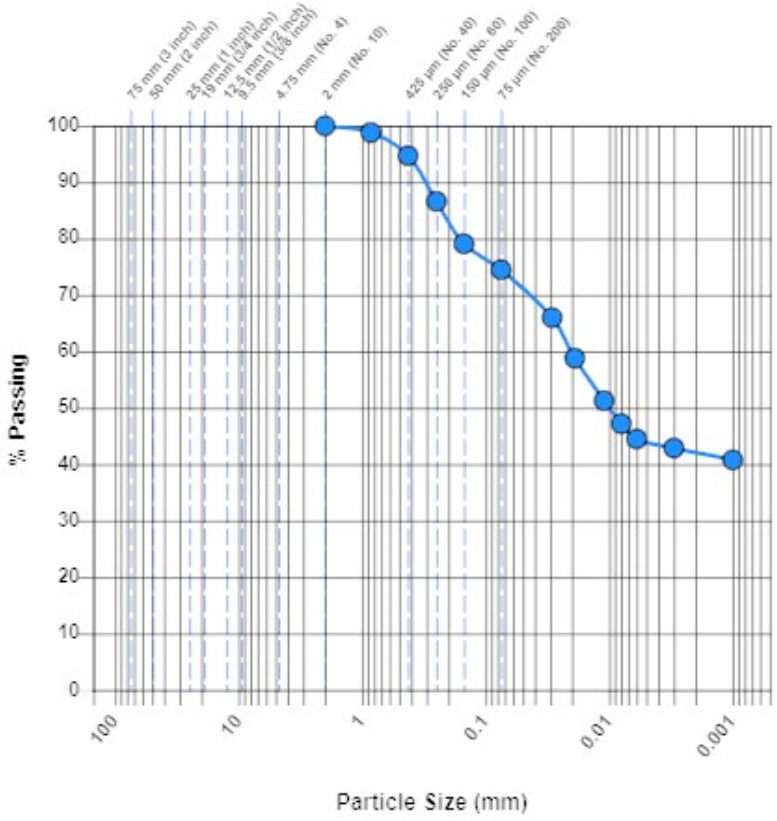
Sample Information

Sample Number:	499091	**Depth (ft):**	0-2
Boring Number:	B-19	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	98.8	-
425 µm (No. 40)	94.7	-
250 µm (No. 60)	86.6	-
150 µm (No. 100)	79.1	-
75 µm (No. 200)	74.5	-
28.9 (µm)	66.0	-
18.8 (µm)	58.8	-
11.1 (µm)	51.3	-
8.0 (µm)	47.2	-
5.7 (µm)	44.5	-
2.8 (µm)	42.9	-
1.2 (µm)	40.8	-



Soil Classification: CH Fat clay with sand

Gravel (%):	0	**Sand (%):**	25.5	**Silt (%):**	30.5	**Clay (%):**	44.0
D_{60} (µm):	20.7						

General

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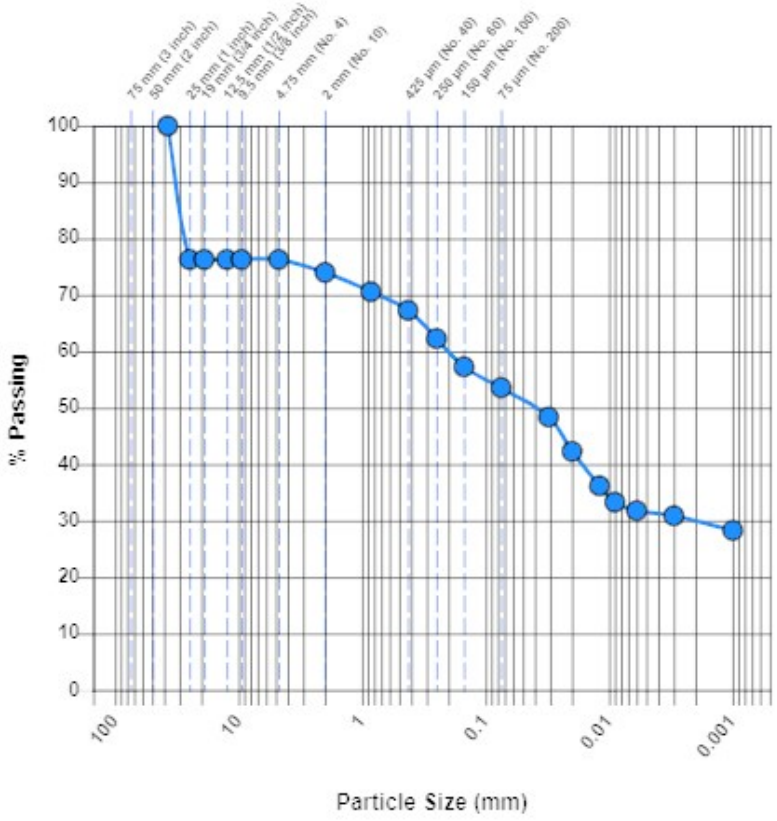
Sample Information

Sample Number:	499092	**Depth (ft):**	2-3.5
Boring Number:	B-19	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
37.5 mm (1.5 inch)	100.0	-
25 mm (1 inch)	76.3	-
19 mm (3/4 inch)	76.3	-
12.5 mm (1/2 inch)	76.3	-
9.5 mm (3/8 inch)	76.3	-
4.75 mm (No. 4)	76.3	-
2 mm (No. 10)	74.0	-
850 µm (No. 20)	70.6	-
425 µm (No. 40)	67.3	-
250 µm (No. 60)	62.3	-
150 µm (No. 100)	57.3	-
75 µm (No. 200)	53.6	-
31.4 (µm)	48.4	-
20.2 (µm)	42.3	-
11.9 (µm)	36.2	-
8.5 (µm)	33.3	-
6.0 (µm)	31.8	-
2.9 (µm)	30.9	-
1.3 (µm)	28.3	-



Soil Classification: CH Fat clay with gravel

Gravel (%):	23.7	**Sand (%):**	22.7	**Silt (%):**	22.1	**Clay (%):**	31.5
D_{60} (µm):	204.0	**D_{30} (µm):**	2.3				

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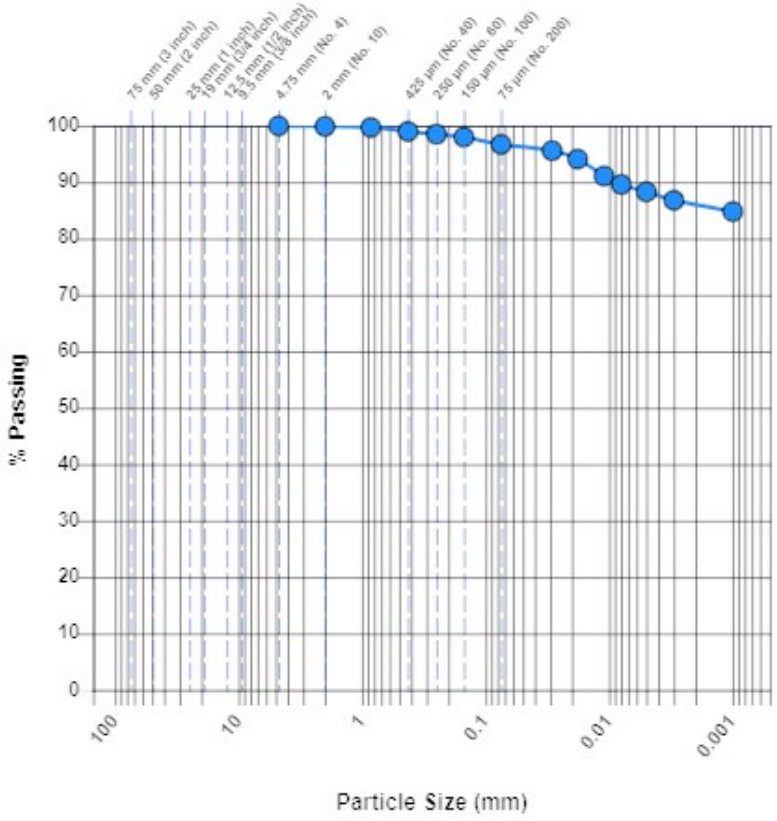
Sample Information

Sample Number:	499093	**Depth (ft):**	17-18.5
Boring Number:	B-19	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
4.75 mm (No. 4)	100.0	-
2 mm (No. 10)	99.9	-
850 µm (No. 20)	99.7	-
425 µm (No. 40)	99.0	-
250 µm (No. 60)	98.5	-
150 µm (No. 100)	98.0	-
75 µm (No. 200)	96.7	-
28.9 (µm)	95.6	-
18.4 (µm)	94.1	-
10.7 (µm)	91.1	-
7.6 (µm)	89.6	-
5.4 (µm)	88.3	-
2.6 (µm)	86.8	-
1.2 (µm)	84.8	-



Soil Classification: CH Fat Clay

Gravel (%):	0.0	**Sand (%):**	3.3	**Silt (%):**	8.4	**Clay (%):**	88.3

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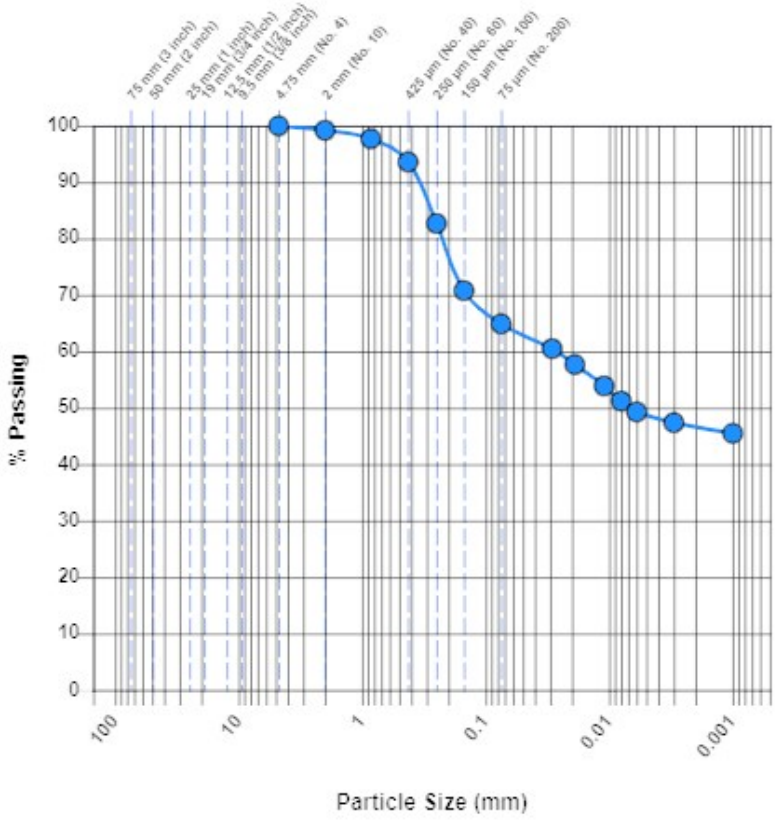
Sample Information

Sample Number:	499095	**Depth (ft):**	0-2
Boring Number:	B-20	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
4.75 mm (No. 4)	100.0	-
2 mm (No. 10)	99.2	-
850 µm (No. 20)	97.7	-
425 µm (No. 40)	93.6	-
250 µm (No. 60)	82.7	-
150 µm (No. 100)	70.8	-
75 µm (No. 200)	64.9	-
28.9 (µm)	60.5	-
18.5 (µm)	57.7	-
10.9 (µm)	53.9	-
7.8 (µm)	51.2	-
5.5 (µm)	49.3	-
2.7 (µm)	47.4	-
1.2 (µm)	45.5	-



Soil Classification: CH Sandy fat clay

Gravel (%):	0.0	**Sand (%):**	35.1	**Silt (%):**	16.2	**Clay (%):**	48.7
D_{60} (µm):	27.2						

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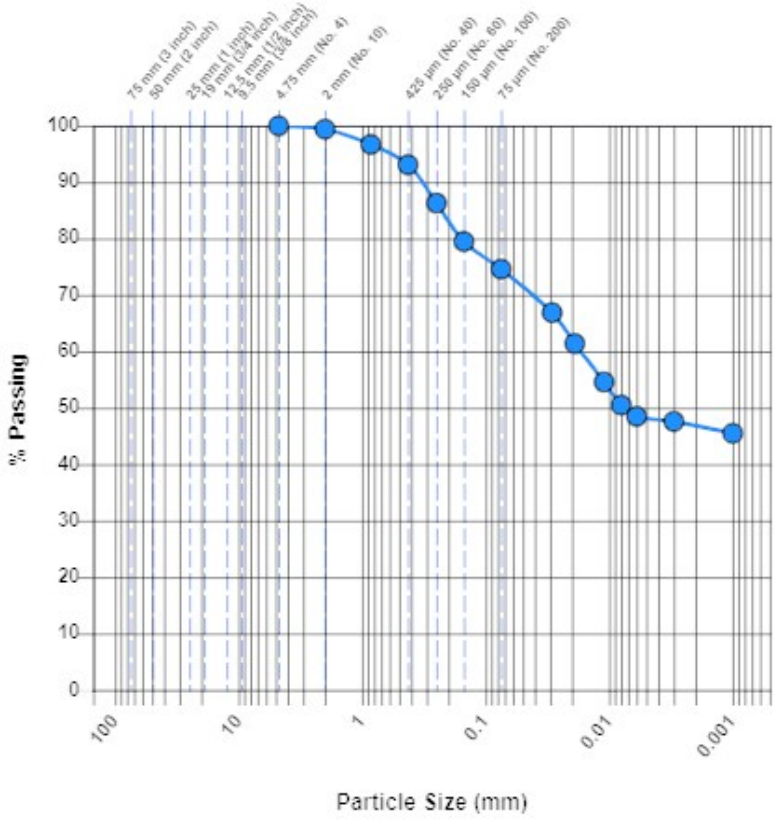
Sample Information

Sample Number:	499096	**Depth (ft):**	0-2
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
4.75 mm (No. 4)	100.0	-
2 mm (No. 10)	99.4	-
850 µm (No. 20)	96.7	-
425 µm (No. 40)	93.1	-
250 µm (No. 60)	86.3	-
150 µm (No. 100)	79.5	-
75 µm (No. 200)	74.6	-
28.8 (µm)	66.9	-
18.6 (µm)	61.4	-
11.0 (µm)	54.6	-
7.9 (µm)	50.5	-
5.6 (µm)	48.5	-
2.8 (µm)	47.6	-
1.2 (µm)	45.5	-



Soil Classification: CH Fat clay with sand

Gravel (%):	0.0	**Sand (%):**	25.4	**Silt (%):**	26.4	**Clay (%):**	48.2
D_{60} (µm):	17.4						

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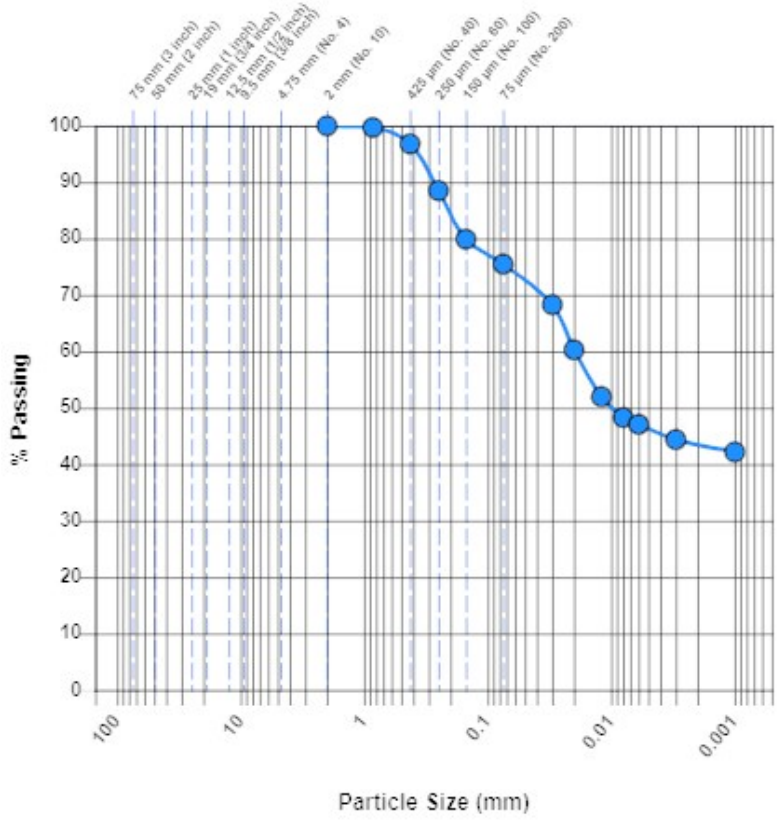
Sample Information

Sample Number:	499098	**Depth (ft):**	2-3.5
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.7	-
425 µm (No. 40)	96.8	-
250 µm (No. 60)	88.5	-
150 µm (No. 100)	79.9	-
75 µm (No. 200)	75.5	-
30.1 (µm)	68.3	-
19.5 (µm)	60.3	-
11.5 (µm)	52.0	-
8.2 (µm)	48.3	-
5.8 (µm)	47.1	-
2.9 (µm)	44.4	-
1.3 (µm)	42.2	-



Soil Classification: CH Fat clay with sand

Gravel (%):	0	**Sand (%):**	24.5	**Silt (%):**	29.3	**Clay (%):**	46.2
D_{60} (µm):	19.7						

General

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BRAUN INTERTEC
The Science You Build On.

Hydrometer And Sieve Analysis

ASTM D422

12/16/2022

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

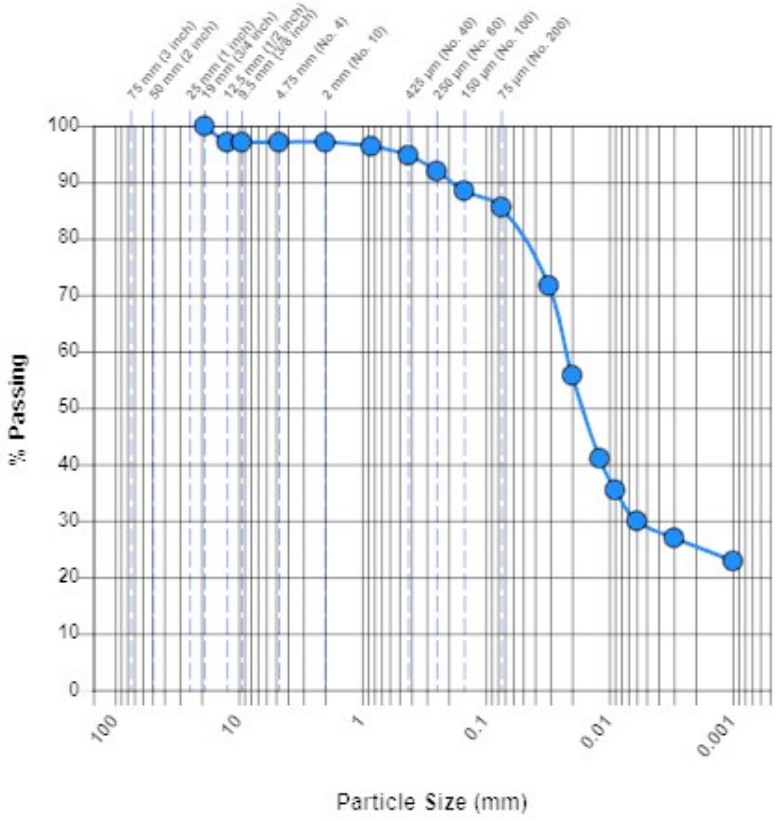
Sample Information

Sample Number:	499099	**Depth (ft):**	9.5-11
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
19 mm (3/4 inch)	100.0	-
12.5 mm (1/2 inch)	97.1	-
9.5 mm (3/8 inch)	97.1	-
4.75 mm (No. 4)	97.1	-
2 mm (No. 10)	97.1	-
850 µm (No. 20)	96.4	-
425 µm (No. 40)	94.8	-
250 µm (No. 60)	92.0	-
150 µm (No. 100)	88.5	-
75 µm (No. 200)	85.6	-
30.5 (µm)	71.7	-
20.1 (µm)	55.8	-
12.0 (µm)	41.1	-
8.6 (µm)	35.5	-
6.1 (µm)	30.0	-
3.0 (µm)	27.0	-
1.3 (µm)	22.9	-



Soil Classification: CL Lean clay

Gravel (%):	2.9	**Sand (%):**	11.5	**Silt (%):**	56.6	**Clay (%):**	29.0
D_{60} (µm):	22.9	**D_{30} (µm):**	6.0				

General

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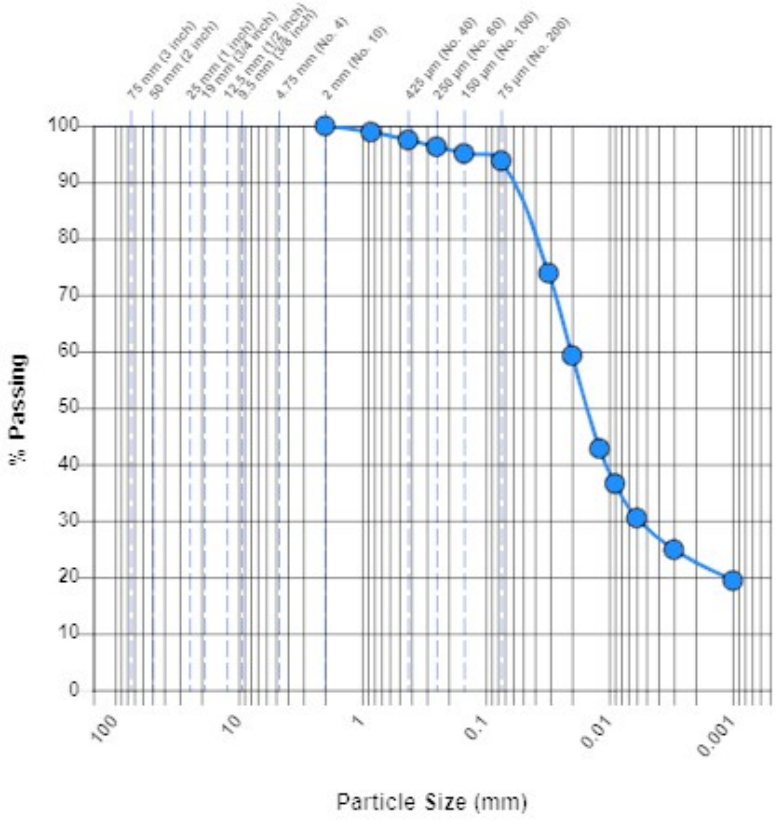
Sample Information

Sample Number:	499100	**Depth (ft):**	12-13.5'
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	98.9	-
425 µm (No. 40)	97.5	-
250 µm (No. 60)	96.3	-
150 µm (No. 100)	95.1	-
75 µm (No. 200)	93.8	-
30.9 (µm)	73.9	-
20.2 (µm)	59.3	-
12.1 (µm)	42.8	-
8.6 (µm)	36.6	-
6.2 (µm)	30.5	-
3.0 (µm)	24.9	-
1.4 (µm)	19.4	-



Soil Classification: CL Lean clay

Gravel (%):	0	**Sand (%):**	6.2	**Silt (%):**	65.2	**Clay (%):**	28.6
D_{60} (µm):	20.5	**D_{30} (µm):**	5.7				

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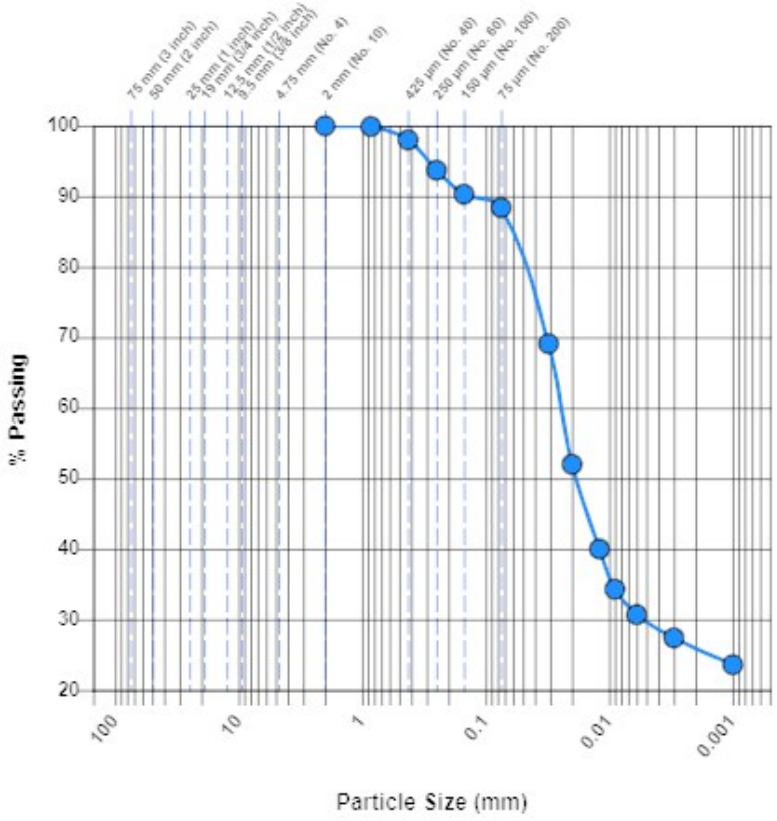
Sample Information

Sample Number:	499101	**Depth (ft):**	17-18.5
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	99.9	-
425 µm (No. 40)	98.0	-
250 µm (No. 60)	93.7	-
150 µm (No. 100)	90.3	-
75 µm (No. 200)	88.4	-
30.8 (µm)	69.1	-
20.3 (µm)	52.0	-
12.0 (µm)	40.0	-
8.6 (µm)	34.3	-
6.1 (µm)	30.7	-
3.0 (µm)	27.4	-
1.3 (µm)	23.6	-



Soil Classification: CL Lean clay

Gravel (%):	0	**Sand (%):**	11.6	**Silt (%):**	58.8	**Clay (%):**	29.6
D_{60} (µm):	25.1	**D_{30} (µm):**	5.4				

General

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Viroqua, WI 54665

Project:

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Vernon County Landfill
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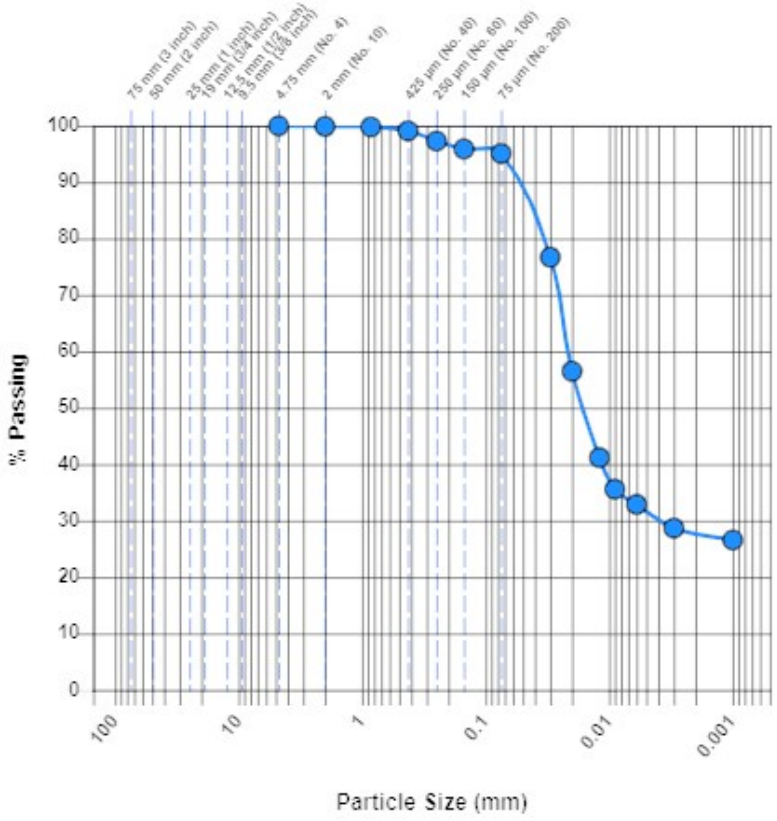
Sample Information

Sample Number:	499102	**Depth (ft):**	19.5-21
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
4.75 mm (No. 4)	100.0	-
2 mm (No. 10)	99.9	-
850 µm (No. 20)	99.8	-
425 µm (No. 40)	99.1	-
250 µm (No. 60)	97.3	-
150 µm (No. 100)	95.9	-
75 µm (No. 200)	95.1	-
30.1 (µm)	76.7	-
20.0 (µm)	56.5	-
12.0 (µm)	41.2	-
8.6 (µm)	35.6	-
6.1 (µm)	32.9	-
3.0 (µm)	28.7	-
1.3 (µm)	26.6	-



Soil Classification: CL Lean clay

Gravel (%):	0.0	**Sand (%):**	4.9	**Silt (%):**	63.6	**Clay (%):**	31.5
D_{60} (µm):	21.7	**D_{30} (µm):**	3.9				

General

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Hydrometer And Sieve Analysis

ASTM D422

12/16/2022

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Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

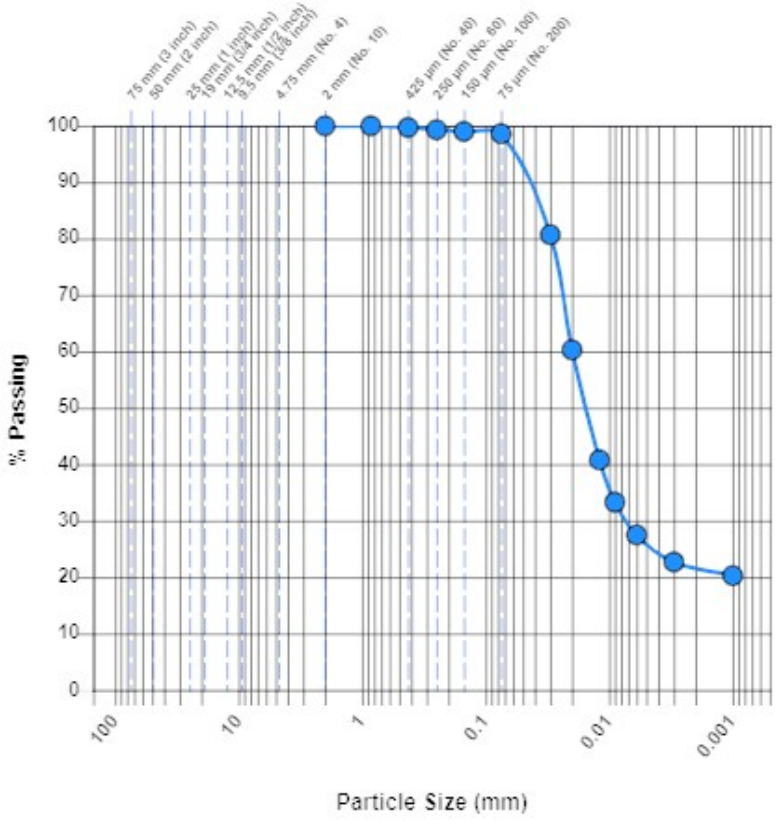
Sample Information

Sample Number:	499104	**Depth (ft):**	29.5-31
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sample Date:	12/15/2022		
Received Date:	12/15/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/16/2022	**Tested By:**	Streier, Jim

Laboratory Data

Sieve-Hydrometer Analysis

Particle Size	% Passing	Specification
2 mm (No. 10)	100.0	-
850 µm (No. 20)	100.0	-
425 µm (No. 40)	99.7	-
250 µm (No. 60)	99.3	-
150 µm (No. 100)	99.0	-
75 µm (No. 200)	98.6	-
30.0 (µm)	80.7	-
20.0 (µm)	60.3	-
12.0 (µm)	40.8	-
8.7 (µm)	33.3	-
6.2 (µm)	27.5	-
3.0 (µm)	22.7	-
1.3 (µm)	20.3	-



Soil Classification: CL Lean clay

Gravel (%):	0	**Sand (%):**	1.4	**Silt (%):**	72.7	**Clay (%):**	25.9
D_{60} (µm):	19.9	**D_{30} (µm):**	7.3				

General

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11001 Hampshire Avenue S
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Phone: 952-995-2000

Standard Proctor M-D Relationship

ASTM D698

Report Date: 12/07/2022

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

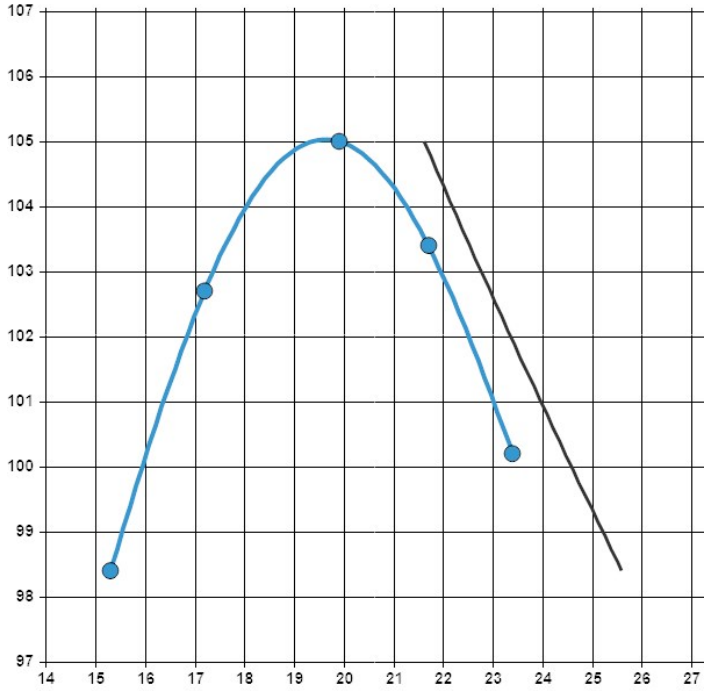
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	497688	**Depth (ft):**	0-2'
Boring Number:	B-19	**Sampled By:**	Drill Crew
Sampling Method:	Auger Boring ASTM D1452		
Location Details:	B-19, 0-2'		
Sample Date:	12/07/2022		
Received Date:	12/07/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/07/2022	**Tested By:**	Vang, Yang

Laboratory Data



Proctor ID:	P-01-std		
Maximum Dry Density (pcf):	105.0		
Optimum Moisture (%):	19.6		
Method:	Method A		
Preparation Method:	Moist		
Rammer Type:	Manual Round		
Specific Gravity:	2.65		
Specific Gravity Source:	Assumed		
Passes #200 (%):	75.0	**Retained #200 (%):**	25.0
Retained On 3/4 (%):	0	**Retained On 3/8 (%):**	0
Retained On #4 (%):	0	**Passing #4 (%):**	100

Classification: CH Fat clay with sand, brown

General

Remarks: The % passing the #200 is for informational purposes only.

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Modified Proctor M-D Relationship

ASTM D1557

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

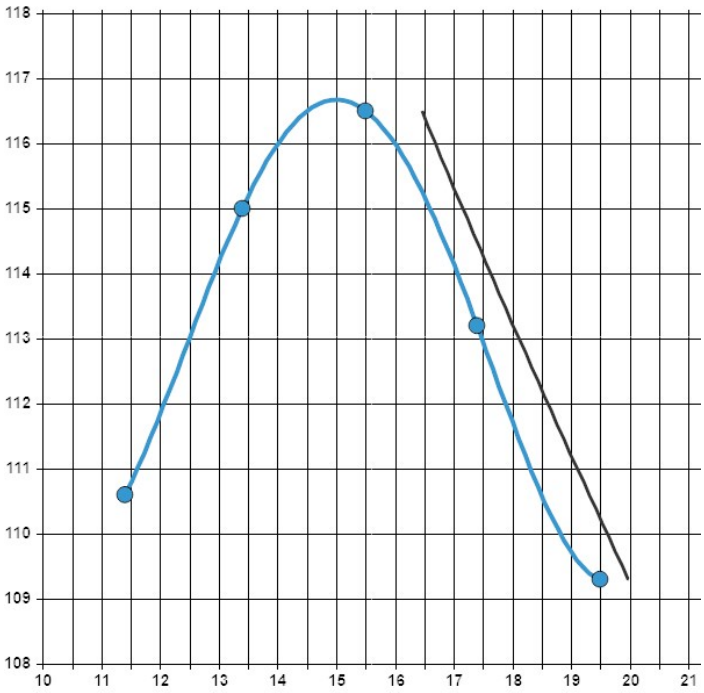
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	497688	**Depth (ft):**	0-2'
Boring Number:	B-19	**Sampled By:**	Drill Crew
Sampling Method:	Auger Boring ASTM D1452		
Location Details:	B-19, 0-2'		
Sample Date:	12/07/2022		
Received Date:	12/07/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/07/2022	**Tested By:**	Vang, Yang

Laboratory Data



Proctor ID:	P-01-mod
Maximum Dry Density (pcf):	116.7
Optimum Moisture (%):	15.0
Method:	Method A
Total Retained:	0 % on #4 Sieve
Preparation Method:	Moist
Rammer Type:	Mechanical Round
Specific Gravity:	2.70
Specific Gravity Source:	Assumed

Passes #200 (%):	75.0	**Retained #200 (%):**	25.0
Retained On 3/4 (%):	0	**Retained On 3/8 (%):**	0
Retained On #4 (%):	0	**Passing #4 (%):**	100

Classification: CH Fat clay with sand, brown

General

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Standard Proctor M-D Relationship

ASTM D698

Report Date: 07/03/2023

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

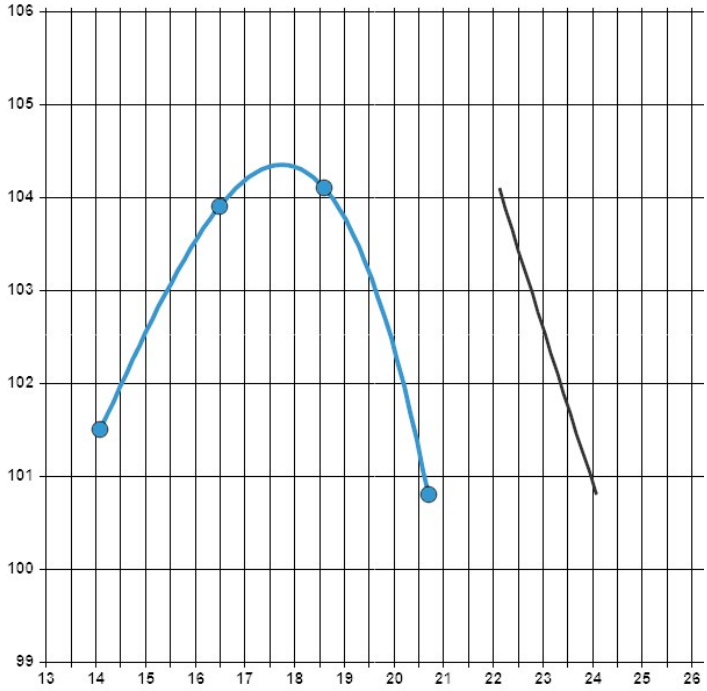
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522626	**Depth (ft):**	0-2
Boring Number:	B-19	**Sampled By:**	Wright, Brandon
Sampling Method:	Project Specified		
Location Details:	B-19		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	05/24/2023	**Tested By:**	Vang, Yang

Laboratory Data



Proctor ID:	P-03-std		
Maximum Dry Density (pcf):	104.3		
Optimum Moisture (%):	17.8		
Method:	Method A		
Preparation Method:	Moist		
Rammer Type:	Manual Round		
Specific Gravity:	2.67		
Specific Gravity Source:	ASTM D854		
Passes #200 (%):	95.0	**Retained #200 (%):**	5.0
Retained On 3/4 (%):	0	**Retained On 3/8 (%):**	0
Retained On #4 (%):	1	**Passing #4 (%):**	99

Classification: Fat Clay (CH)

General

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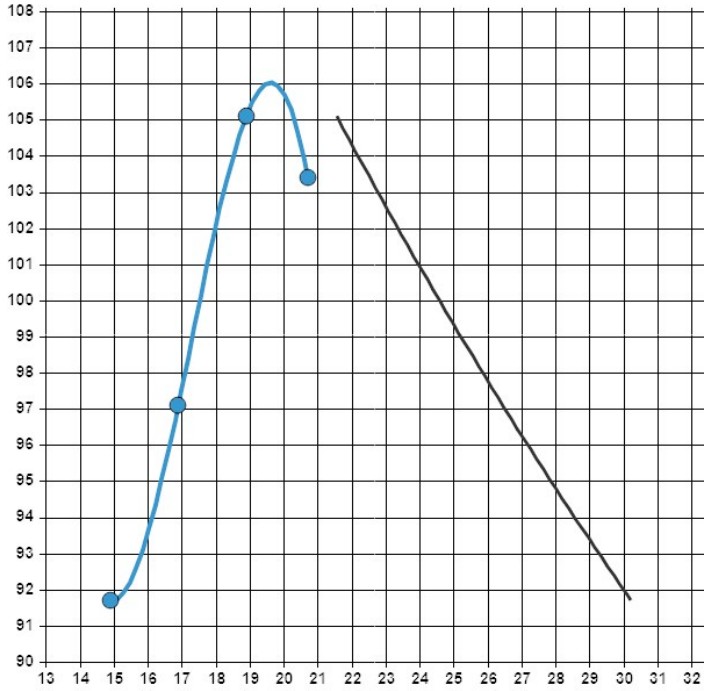
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522628	**Depth (ft):**	0-2
Boring Number:	B-20	**Sampled By:**	Wright, Brandon
Sampling Method:	Project Specified		
Location Details:	B-20		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	05/24/2023	**Tested By:**	Vang, Yang

Laboratory Data



Proctor ID:	P-04-std		
Maximum Dry Density (pcf):	106.0		
Optimum Moisture (%):	19.6		
Method:	Method A		
Preparation Method:	Moist		
Rammer Type:	Manual Round		
Specific Gravity:	2.66		
Specific Gravity Source:	ASTM D854		
Passes #200 (%):	52.0	**Retained #200 (%):**	48.0
Retained On 3/4 (%):	4	**Retained On 3/8 (%):**	5
Retained On #4 (%):	5	**Passing #4 (%):**	95

Classification: CL Sandy lean clay, brown

General

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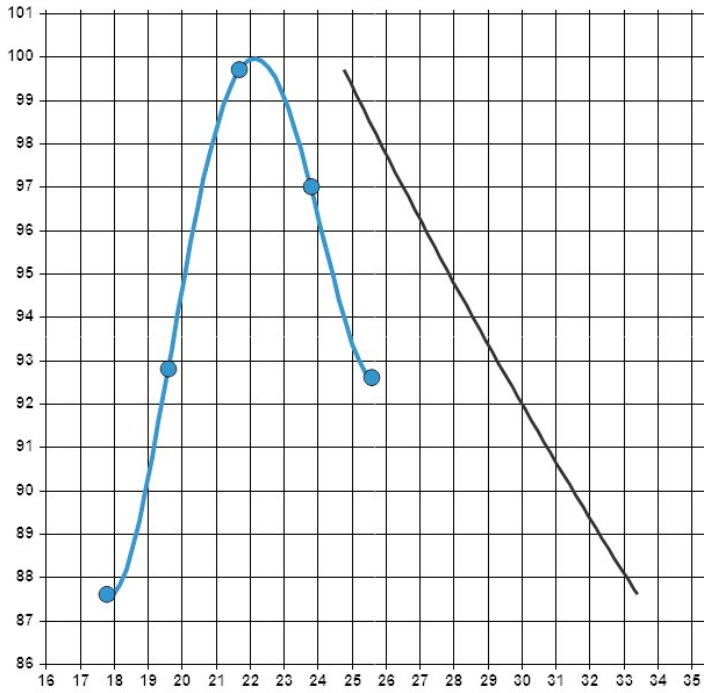
Project:

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Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	497689	**Depth (ft):**	0-2'
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sampling Method:	Auger Boring ASTM D1452		
Location Details:	B-21, 0-2'		
Sample Date:	12/07/2022		
Received Date:	12/07/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/07/2022	**Tested By:**	Vang, Yang

Laboratory Data



Proctor ID:	P-02-std		
Maximum Dry Density (pcf):	100.0		
Optimum Moisture (%):	22.1		
Method:	Method A		
Preparation Method:	Moist		
Rammer Type:	Manual Round		
Specific Gravity:	2.65		
Specific Gravity Source:	Assumed		
Passes #200 (%):	72.0	**Retained #200 (%):**	28.0
Retained On 3/4 (%):	0	**Retained On 3/8 (%):**	0
Retained On #4 (%):	1	**Passing #4 (%):**	99

Classification: CH Fat clay with sand, brown

General

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Modified Proctor M-D Relationship

ASTM D1557

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Viroqua, WI 54665

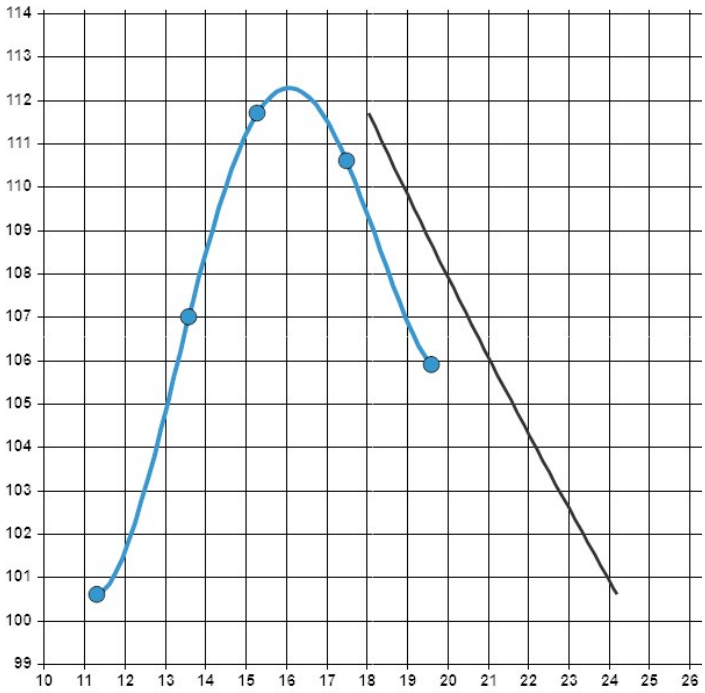
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	497689	**Depth (ft):**	0-2'
Boring Number:	B-21	**Sampled By:**	Drill Crew
Sampling Method:	Auger Boring ASTM D1452		
Location Details:	B-21, 0-2'		
Sample Date:	12/07/2022		
Received Date:	12/07/2022	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	12/07/2022	**Tested By:**	Vang, Yang

Laboratory Data



Proctor ID:	P-02-mod
Maximum Dry Density (pcf):	112.3
Optimum Moisture (%):	16.1
Method:	Method A
Total Retained:	1 % on #4 Sieve
Preparation Method:	Moist
Rammer Type:	Mechanical Round
Specific Gravity:	2.65
Specific Gravity Source:	Assumed

Passes #200 (%):	72.0	**Retained #200 (%):**	28.0
Retained On 3/4 (%):	0	**Retained On 3/8 (%):**	0
Retained On #4 (%):	1	**Passing #4 (%):**	99

Classification: CH Fat clay with sand, brown

General

Remarks: The % passing the #200 is for informational purposes only.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
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Hydraulic Conductivity

ASTM D5084

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522626	**Depth (ft):**	0-2
Sampling Method:	Project Specified	**Sampled By:**	Wright, Brandon
Boring Number:	B-19		
Sample Location :	B-19		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/09/2023	**Tested By:**	Seokaran, Kanhai

Laboratory Data

Type Of Specimen:	Remolded	**Back Pressure (psi):**	81.00	
Permeant Liquid:	Water	**Specific Gravity:**	2.67	(ASTM D854)
Saturation B Coefficient:	1.00	**Effective Pressure (psi):**	8.00	

Method: Method C Falling Head Rising Tailwater

Elapsed Time (sec)	Average Test Temp. (°C)	Influent Reading Initial (cm)	Influent Reading Final (cm)	Effluent Reading Initial (cm)	Effluent Reading Final (cm)	Average Head Loss (cm)	Hydraulic Gradient	Hydraulic Conductivity @ 20 °C (cm/sec)
19380	22.0	19.60	19.40	6.40	6.60	224.0	39.76	5.7E-09
49260	22.0	19.40	18.90	6.60	7.10	223.3	39.64	5.6E-09
36780	22.0	18.90	18.55	7.10	7.45	222.5	39.49	5.3E-09
37920	22.0	18.55	18.20	7.45	7.80	221.8	39.36	5.1E-09

Average Of Last Four Hydraulic Conductivity (cm/sec): 5.4E-09

	Initial	Final
Saturation (%)	84.8	99.6
Moisture Content (%):	18	24.3
Dry Density Of Specimen (pcf):	106.3	101.0
Soil Classification:	CH Fat clay	

General

Remarks: Control parameters meet the testing requirements.

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Hydraulic Conductivity

ASTM D5084

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522626	**Depth (ft):**	0-2
Sampling Method:	Project Specified	**Sampled By:**	Wright, Brandon
Boring Number:	B-19		
Sample Location :	B-19		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/09/2023	**Tested By:**	Seokaran, Kanhai

Laboratory Data

Type Of Specimen:	Remolded	**Back Pressure (psi):**	81.00	
Permeant Liquid:	Water	**Specific Gravity:**	2.67	(ASTM D854)
Saturation B Coefficient:	1.00	**Effective Pressure (psi):**	8.00	

Method: Method C Falling Head Rising Tailwater

Elapsed Time (sec)	Average Test Temp. (°C)	Influent Reading Initial (cm)	Influent Reading Final (cm)	Effluent Reading Initial (cm)	Effluent Reading Final (cm)	Average Head Loss (cm)	Hydraulic Gradient	Hydraulic Conductivity @ 20 °C (cm/sec)
19380	22.0	11.20	11.00	16.80	17.00	205.2	36.63	6.2E-09
49140	22.0	11.00	10.45	17.00	17.55	204.5	36.49	6.7E-09
89580	22.0	10.65	9.85	14.00	14.80	206.9	36.92	5.3E-09
9300	22.0	10.00	9.90	14.90	15.00	206.0	36.77	6.4E-09

Average Of Last Four Hydraulic Conductivity (cm/sec): 6.1E-09

	Initial	Final
Saturation (%)	82.2	99.6
Moisture Content (%):	19.7	24.3
Dry Density Of Specimen (pcf):	101.6	100.9
Soil Classification:	CH Fat clay	

General

Remarks: Control parameters meet the testing requirements.

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Hydraulic Conductivity

ASTM D5084

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number: 522628
Depth (ft): 0-2
Sampling Method: Project Specified
Sampled By: Wright, Brandon
Boring Number: B-20
Sample Location : B-20
Sample Date: 05/24/2023
Received Date: 05/24/2023
Lab: 11001 Hampshire Ave S, Bloomington, MN
Tested Date: 06/08/2023
Tested By: Seokaran, Kanhai

Laboratory Data

Type Of Specimen: Remolded
Back Pressure (psi): 81.00
Permeant Liquid: Water
Specific Gravity: 2.66 (ASTM D854)
Saturation B Coefficient: 1.00
Effective Pressure (psi): 8.00
Method: Method C Falling Head Rising Tailwater

Elapsed Time (sec)	Average Test Temp. (°C)	Influent Reading Initial (cm)	Influent Reading Final (cm)	Effluent Reading Initial (cm)	Effluent Reading Final (cm)	Average Head Loss (cm)	Hydraulic Gradient	Hydraulic Conductivity @ 20 °C (cm/sec)
360	22.0	20.90	20.70	6.50	6.70	225.2	39.94	3.0E-07
900	22.0	20.70	20.20	6.70	7.20	224.5	39.81	3.0E-07
2940	22.0	20.20	18.60	7.20	8.80	222.4	39.44	3.0E-07
7740	22.0	18.60	14.60	8.80	12.80	216.8	38.45	2.9E-07

Average Of Last Four Hydraulic Conductivity (cm/sec): 3.0E-07

	Initial	Final
Saturation (%)	85.1	99.2
Moisture Content (%):	22.0	24.8
Dry Density Of Specimen (pcf):	98.4	99.7

Soil Classification: CL Sandy lean clay

General

Remarks: Control parameters meet the testing requirements.

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Hydraulic Conductivity

ASTM D5084

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number: 498838
Depth (ft): 26-28.5
Boring Number: MW-14
Sampled By: Drill Crew
Sample Date: 11/29/2022
Received Date: 12/14/2022
Lab: 11001 Hampshire Ave S, Bloomington, MN
Tested Date: 12/14/2022
Tested By: Seokaran, Kanhai

Laboratory Data

Type Of Specimen: Intact
Back Pressure (psi): 81.00
Permeant Liquid: Water
Specific Gravity: 2.65 (Assumed)
Saturation B Coefficient: 1.00
Effective Pressure (psi): 8.00
Method: Method C Falling Head Rising Tailwater

Elapsed Time (sec)	Average Test Temp. (°C)	Influent Reading Initial (cm)	Influent Reading Final (cm)	Effluent Reading Initial (cm)	Effluent Reading Final (cm)	Average Head Loss (cm)	Hydraulic Gradient	Hydraulic Conductivity @ 20 °C (cm/sec)
18600	22.0	13.50	12.75	10.30	11.05	213.5	31.65	3.0E-08
18240	22.0	10.20	9.30	13.60	14.50	206.7	30.65	3.8E-08
239160	22.0	9.55	0.95	14.50	23.10	197.5	29.28	2.9E-08
15300	22.0	21.00	20.40	8.50	9.10	222.9	33.05	2.8E-08

Average Of Last Four Hydraulic Conductivity (cm/sec): 3.1E-08

	Initial	Final
Saturation (%)	105.6	105.2
Moisture Content (%):	25.3	24.1
Dry Density Of Specimen (pcf):	101.2	102.9

Soil Classification: CL Lean clay

General

Results: The test is for informational purposes.

Remarks: Control parameters meet the testing requirements.

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Hydraulic Conductivity

ASTM D5084

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number: 498836
Depth (ft): 10-12
Boring Number: MW-16
Sampled By: Drill Crew
Sample Date: 11/29/2022
Received Date: 12/14/2022
Lab: 11001 Hampshire Ave S, Bloomington, MN
Tested Date: 12/14/2022
Tested By: Seokaran, Kanhai

Laboratory Data

Type Of Specimen: Intact
Back Pressure (psi): 81.00
Permeant Liquid: Water
Specific Gravity: 2.65 (Assumed)
Saturation B Coefficient: 1.00
Effective Pressure (psi): 8.00
Method: Method C Falling Head Rising Tailwater

Elapsed Time (sec)	Average Test Temp. (°C)	Influent Reading Initial (cm)	Influent Reading Final (cm)	Effluent Reading Initial (cm)	Effluent Reading Final (cm)	Average Head Loss (cm)	Hydraulic Gradient	Hydraulic Conductivity @ 20 °C (cm/sec)
18060	22.0	18.25	18.05	4.65	4.85	224.4	31.75	2.9E-08
33300	22.0	16.25	15.90	7.90	8.25	219.0	30.98	2.9E-08
70200	22.0	15.90	15.15	8.25	9.00	217.9	30.83	2.9E-08
17580	22.0	15.40	15.20	9.00	9.20	217.2	30.73	3.1E-08

Average Of Last Four Hydraulic Conductivity (cm/sec): 3.0E-08

	Initial	Final
Saturation (%)	113.2	109.7
Moisture Content (%):	25.7	25.4
Dry Density Of Specimen (pcf):	103.3	102.6

Soil Classification: CL Lean clay

General

Results: The test is for informational purposes.

Remarks: Control parameters meet the testing requirements.

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Specific Gravity Of Soil

ASTM D854

Report Date: 07/03/2023

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	522626	**Depth (ft):**	0-2
Sampling Method:	Project Specified	**Sampled By:**	Wright, Brandon
Boring Number:	B-19		
Location Details:	B-19		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/08/2023	**Tested By:**	Streier, Jim

Laboratory Data

Soil Specific Gravity At 20 °C:	2.67
Method Used:	Method B Dry

General

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
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Specific Gravity Of Soil

ASTM D854

Report Date: 07/03/2023

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling Department
S3705 County Road LF
Viroqua, WI 54665

Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

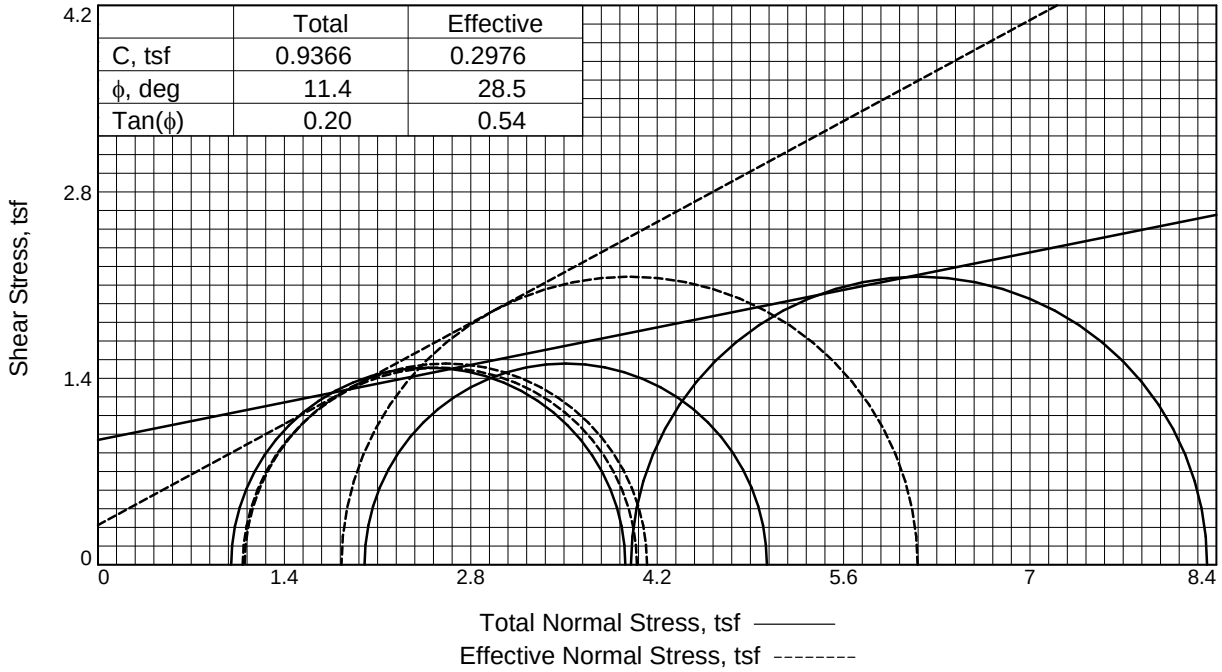
Sample Number:	522628	**Depth (ft):**	0-2
Sampling Method:	Project Specified	**Sampled By:**	Wright, Brandon
Boring Number:	B-20		
Location Details:	B-20		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	**Lab:**	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/08/2023	**Tested By:**	Streier, Jim

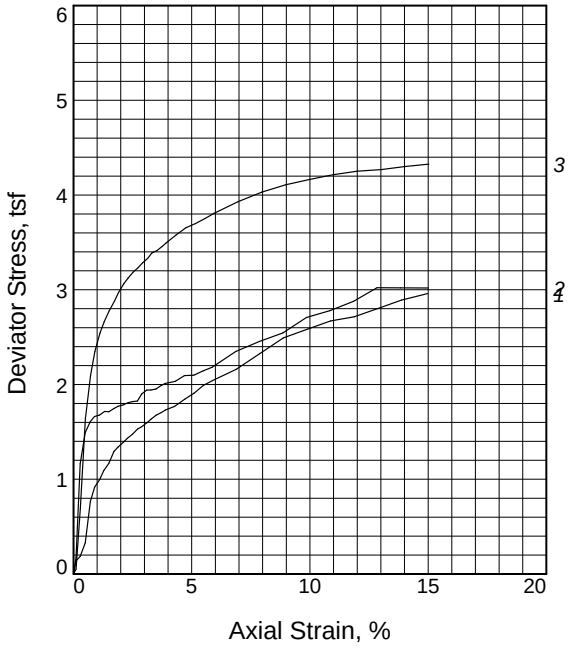
Laboratory Data

Soil Specific Gravity At 20 °C:	2.66
Method Used:	Method B Dry

General

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.





Sample No.		1	2	3
Initial	Water Content, %	26.3	25.4	28.5
	Dry Density, pcf	99.3	96.0	95.4
	Saturation, %	99.1	88.8	98.2
	Void Ratio	0.7291	0.7874	0.7991
	Diameter, in.	1.411	1.398	1.409
	Height, in.	2.824	2.821	2.814
At Test	Water Content, %	25.3	28.0	26.3
	Dry Density, pcf	101.3	97.1	99.5
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6945	0.7687	0.7246
	Diameter, in.	1.402	1.393	1.389
	Height, in.	2.805	2.812	2.775
Strain rate, %/min.				
Back Pressure, tsf		6.127	5.126	3.125
Cell Pressure, tsf		7.128	7.128	7.128
Fail. Stress, tsf		2.960	3.022	4.327
Total Pore Pr., tsf		6.041	6.026	5.299
Ult. Stress, tsf		2.960	3.019	4.327
Total Pore Pr., tsf		6.041	5.969	5.299
$\bar{\sigma}_1$ Failure, tsf		4.048	4.124	6.156
$\bar{\sigma}_3$ Failure, tsf		1.087	1.102	1.829

Type of Test:
CU with Pore Pressures

Sample Type: Shelby Tube

Description: Lean Clay (CL), brown

LL= 43 **PL=** 22 **PI=** 21

Assumed Specific Gravity= 2.75

Remarks: CU Triax ASTM D 4767

Figure _____

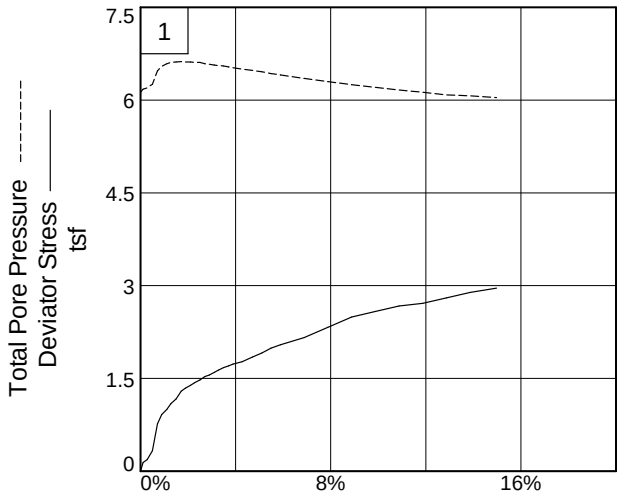
Client: Vernon County Solid Waste & Recycling Department

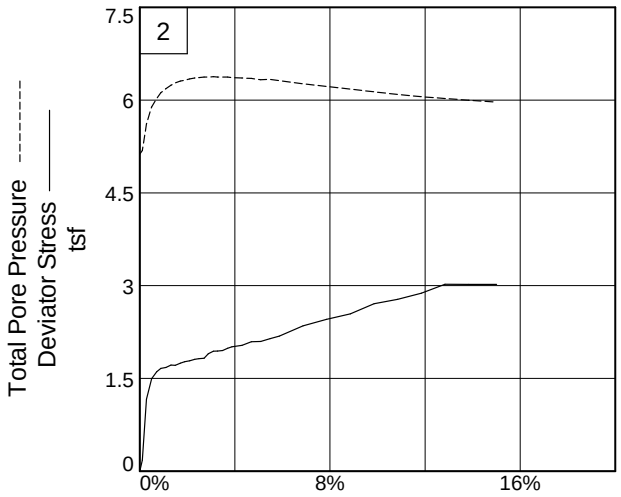
Project: Vernon County Landfill
S3705 County Road LF, Viroqua, WI

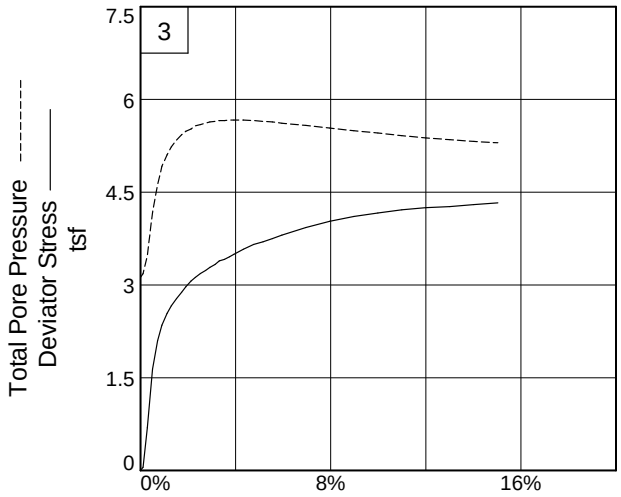
Source of Sample: MW-16 **Depth:** 7-9'

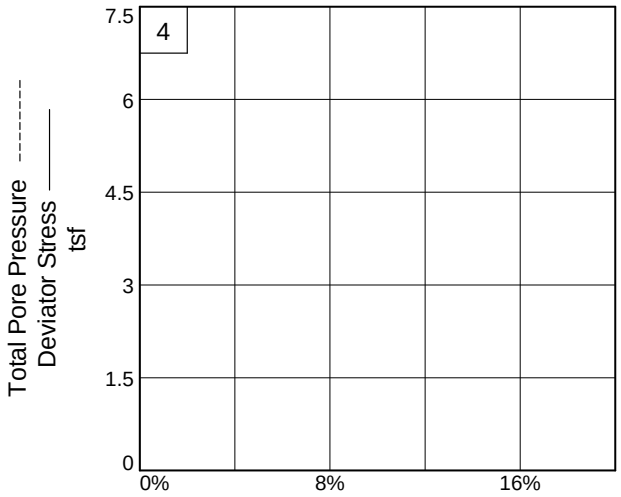
Proj. No.: B2205032 **Date Sampled:**

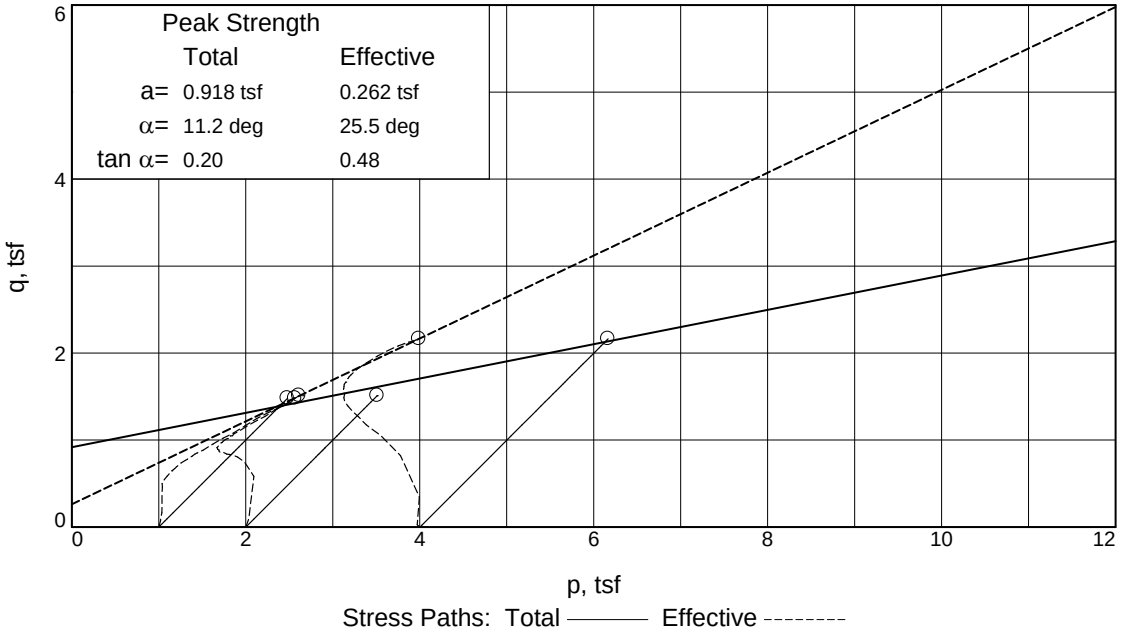
BRAUN INTERTEC











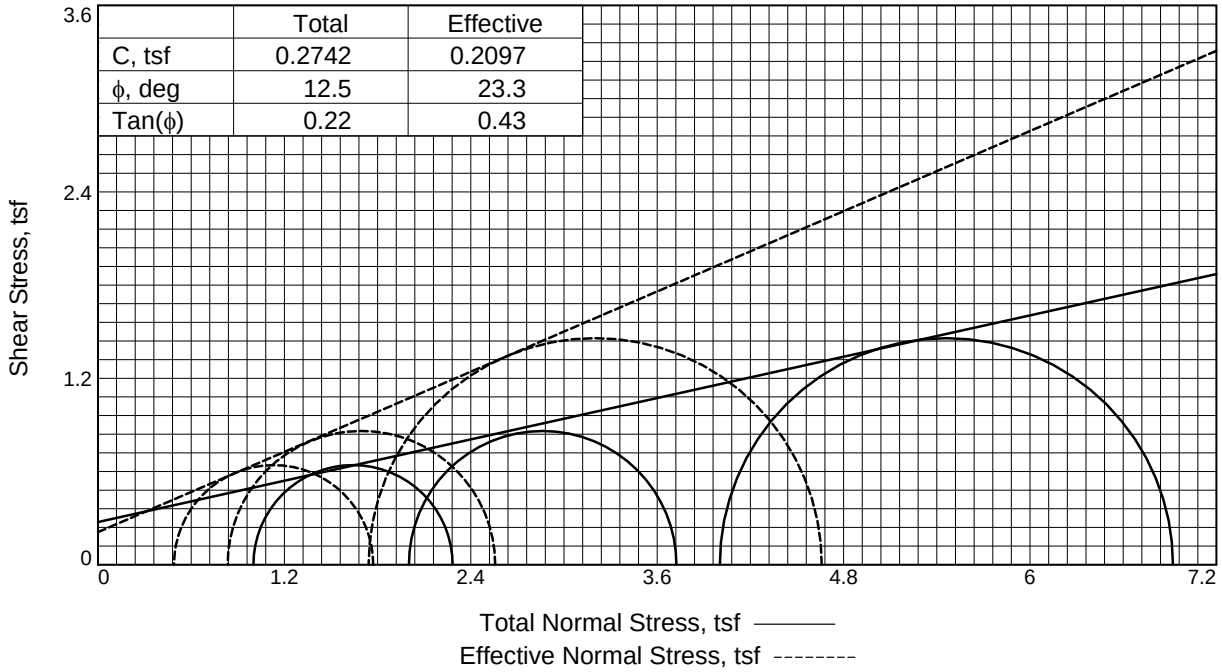
Client: Vernon County Solid Waste & Recycling Department

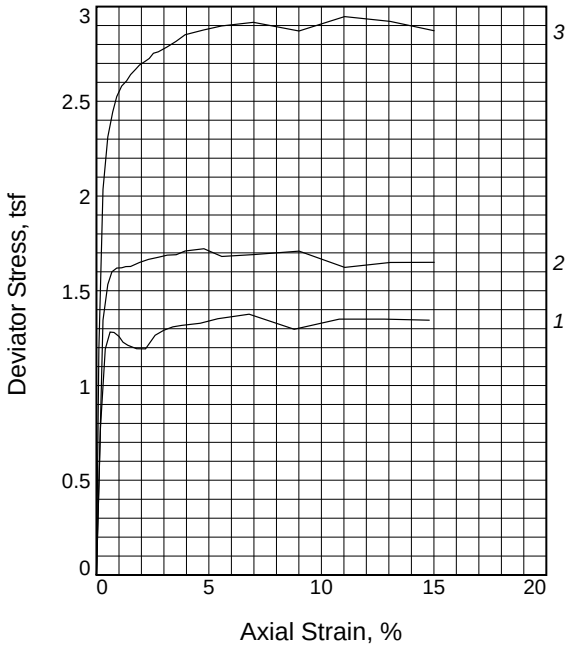
Project: Vernon County Landfill

Source of Sample: MW-16 **Depth:** 7-9'

Project No.: B2205032 **Figure** _____

Braun Intertec





Sample No.		1	2	3
Initial	Water Content, %	24.2	24.2	24.2
	Dry Density, pcf	99.2	97.8	98.4
	Saturation, %	94.9	91.8	93.2
	Void Ratio	0.6807	0.7038	0.6934
	Diameter, in.	1.405	1.406	1.403
	Height, in.	2.801	2.778	2.801
At Test	Water Content, %	25.3	25.4	23.5
	Dry Density, pcf	99.5	99.3	102.3
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6753	0.6781	0.6287
	Diameter, in.	1.403	1.399	1.385
	Height, in.	2.798	2.764	2.765
Strain rate, %/min.				
Back Pressure, tsf		6.127	5.126	3.125
Cell Pressure, tsf		7.128	7.128	7.128
Fail. Stress, tsf		1.282	1.722	2.917
Total Pore Pr., tsf		6.638	6.293	5.386
Ult. Stress, tsf		1.194	1.623	2.871
Total Pore Pr., tsf		6.617	6.199	5.335
$\bar{\sigma}_1$ Failure, tsf		1.772	2.557	4.659
$\bar{\sigma}_3$ Failure, tsf		0.490	0.835	1.742

Type of Test:
CU with Pore Pressures

Sample Type: Remold

Description: Fat Clay (CH), brown

Assumed Specific Gravity= 2.67

Remarks: CU Triax ASTM D 4767

Figure _____

Client: Vernon County Solid Waste & Recycling Department

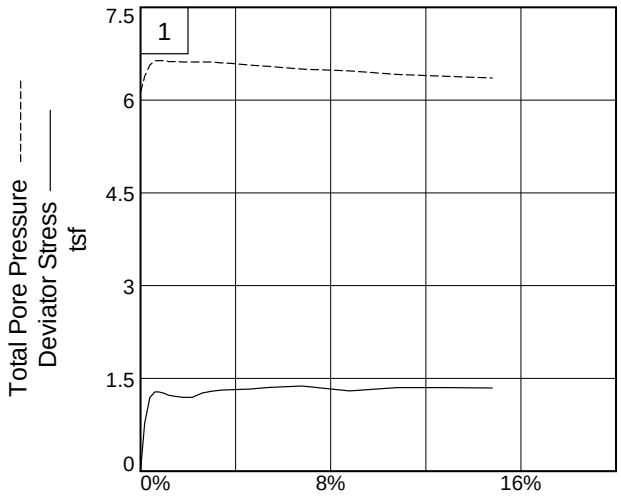
Project: Vernon County Landfill
S3705 County Road LF, Viroqua, WI

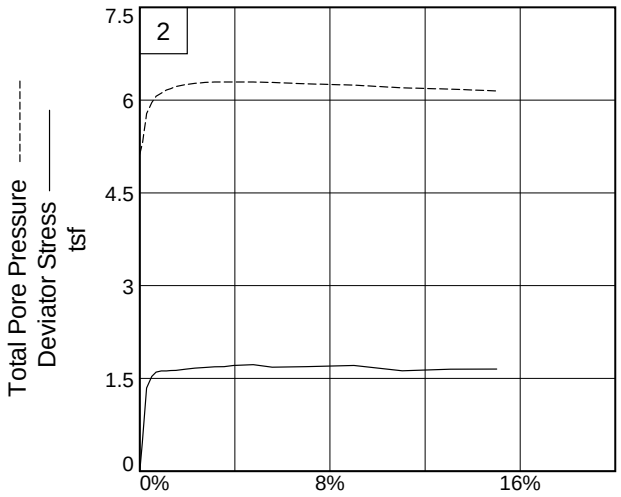
Source of Sample: B-19

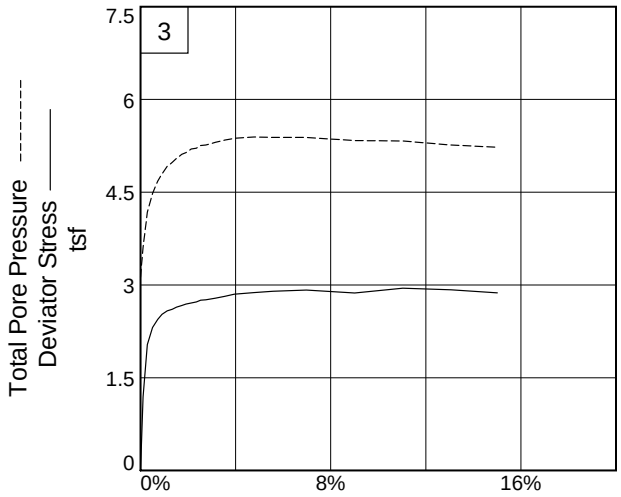
Sample Number: 522626

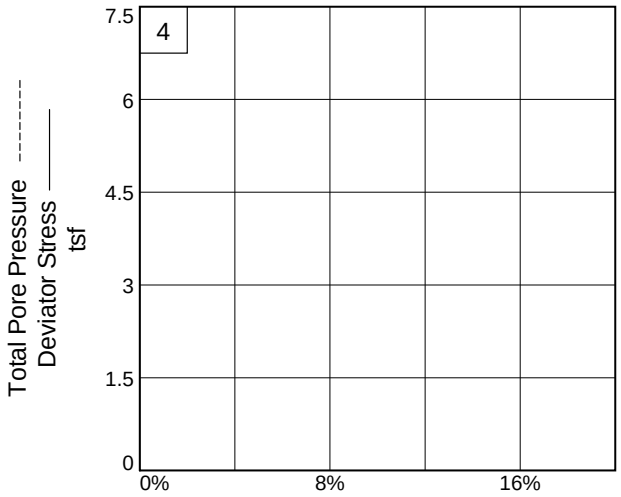
Proj. No.: B2205032 **Date Sampled:**

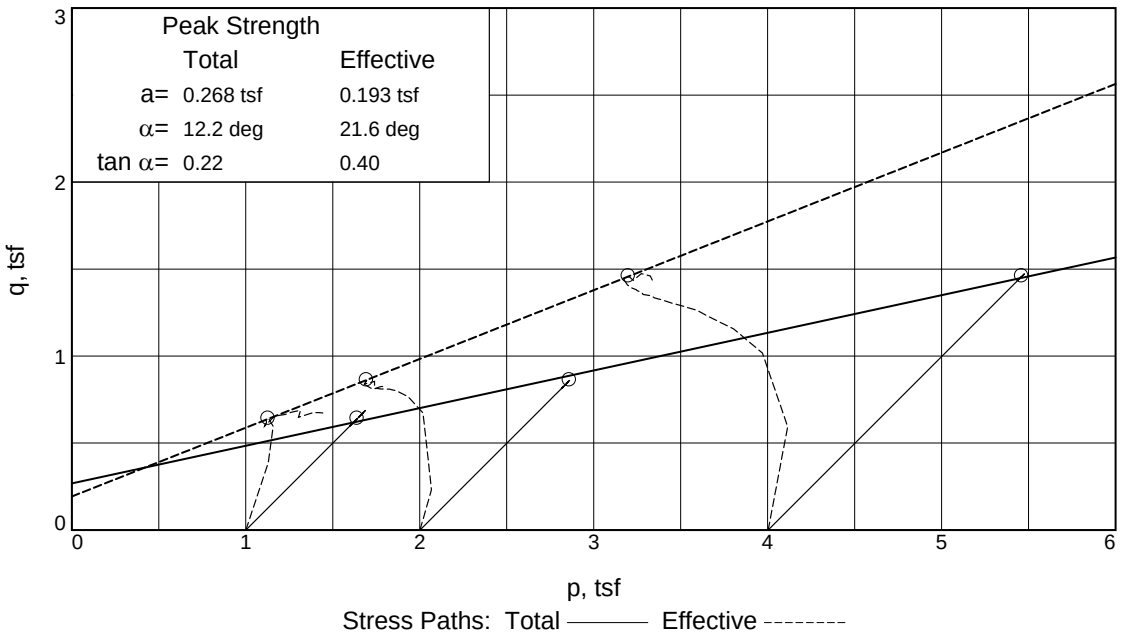
BRAUN INTERTEC











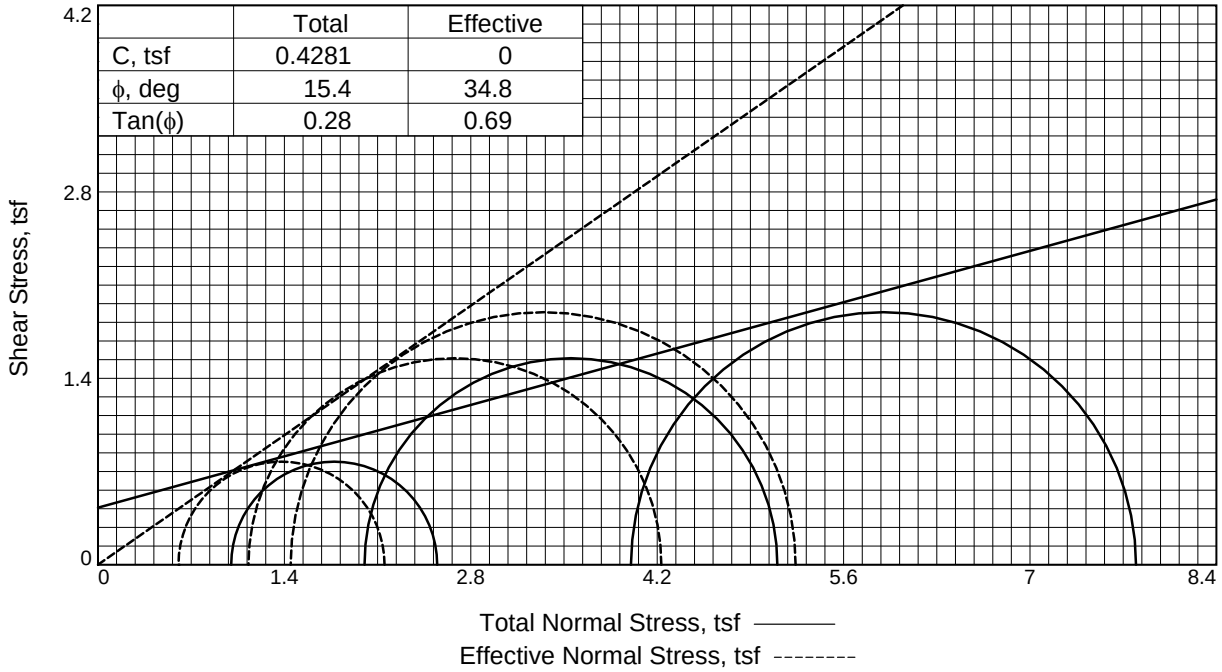
Client: Vernon County Solid Waste & Recycling Department

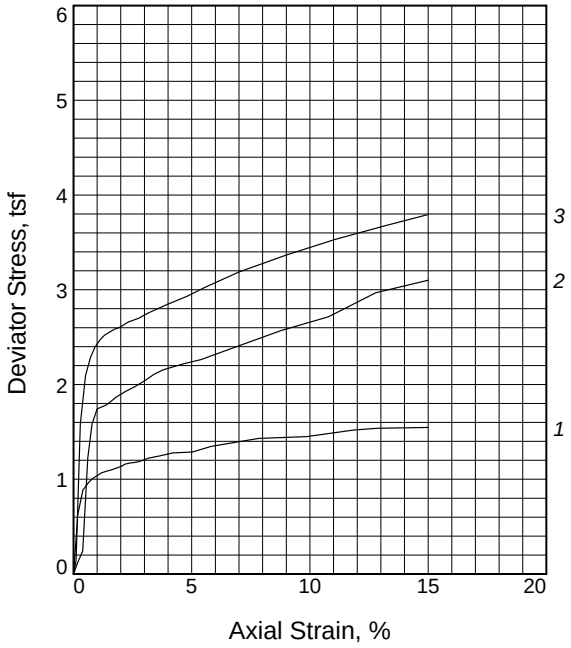
Project: Vernon County Landfill

Source of Sample: B-19 **Sample Number:** 522626

Project No.: B2205032 **Figure** _____

Braun Intertec





Sample No.		1	2	3
Initial	Water Content, %	25.3	25.3	25.3
	Dry Density, pcf	97.6	98.6	97.4
	Saturation, %	96.0	98.4	95.5
	Void Ratio	0.7014	0.6841	0.7047
	Diameter, in.	1.420	1.410	1.403
	Height, in.	2.793	2.803	2.814
At Test	Water Content, %	25.6	25.6	22.7
	Dry Density, pcf	98.8	98.8	103.6
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6814	0.6805	0.6025
	Diameter, in.	1.414	1.409	1.374
	Height, in.	2.782	2.801	2.757
Strain rate, %/min.				
Back Pressure, tsf		6.127	5.126	3.125
Cell Pressure, tsf		7.128	7.128	7.128
Fail. Stress, tsf		1.547	3.101	3.792
Total Pore Pr., tsf		6.523	5.998	5.681
Ult. Stress, tsf		1.547	3.101	3.792
Total Pore Pr., tsf		6.523	5.998	5.681
$\bar{\sigma}_1$ Failure, tsf		2.152	4.231	5.240
$\bar{\sigma}_3$ Failure, tsf		0.605	1.130	1.447

Type of Test:
CU with Pore Pressures

Sample Type: Remold

Description: Sandy Lean Clay (CL), brown

Assumed Specific Gravity= 2.66

Remarks: CU Triax ASTM D 4767

Figure _____

Client: Vernon County Solid Waste & Recycling Department

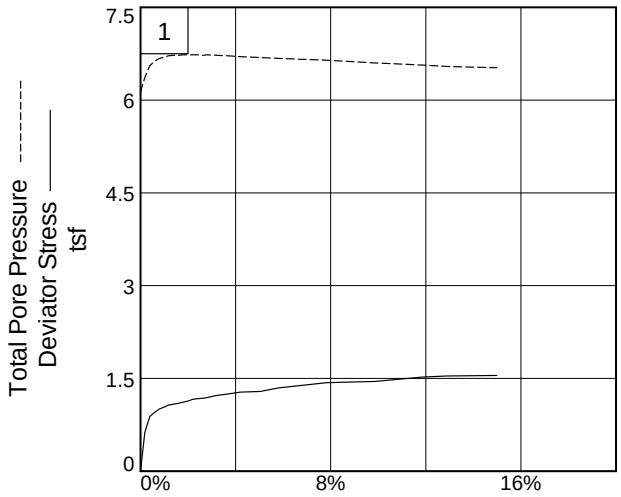
Project: Vernon County Landfill
S3705 County Road LF, Viroqua, WI

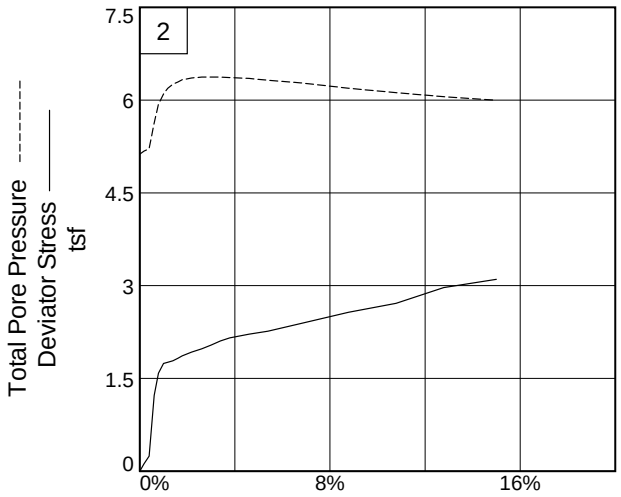
Source of Sample: B-20

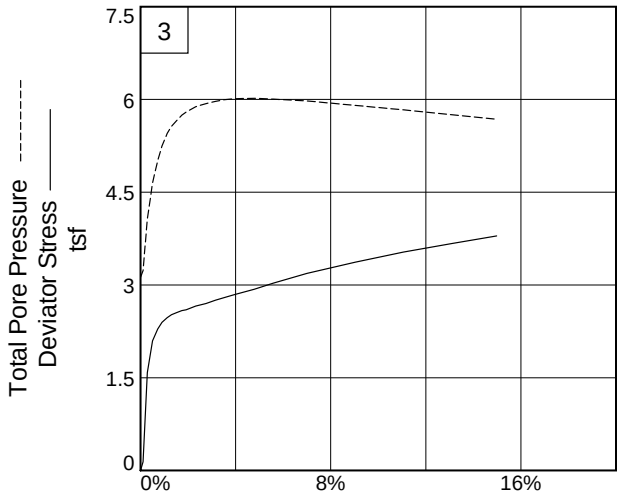
Sample Number: 522628

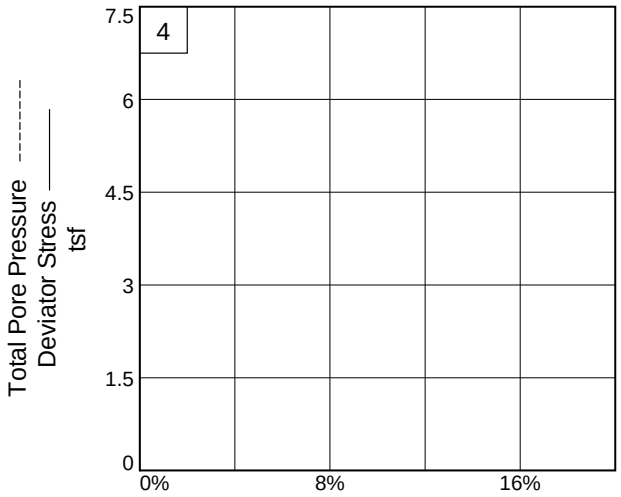
Proj. No.: B2205032 **Date Sampled:**

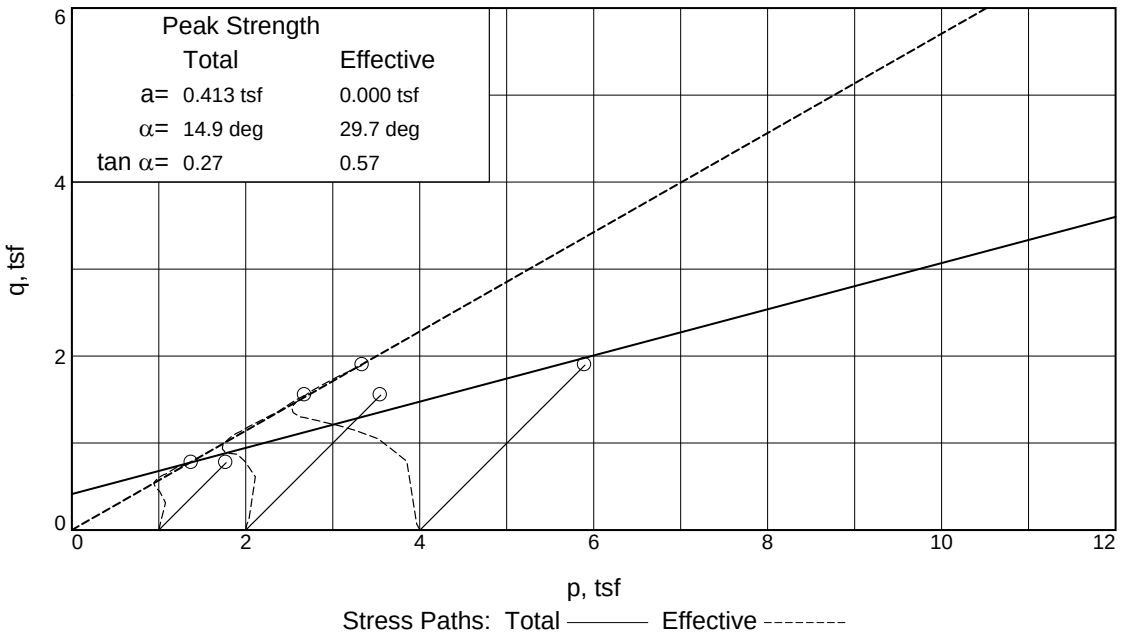
BRAUN INTERTEC











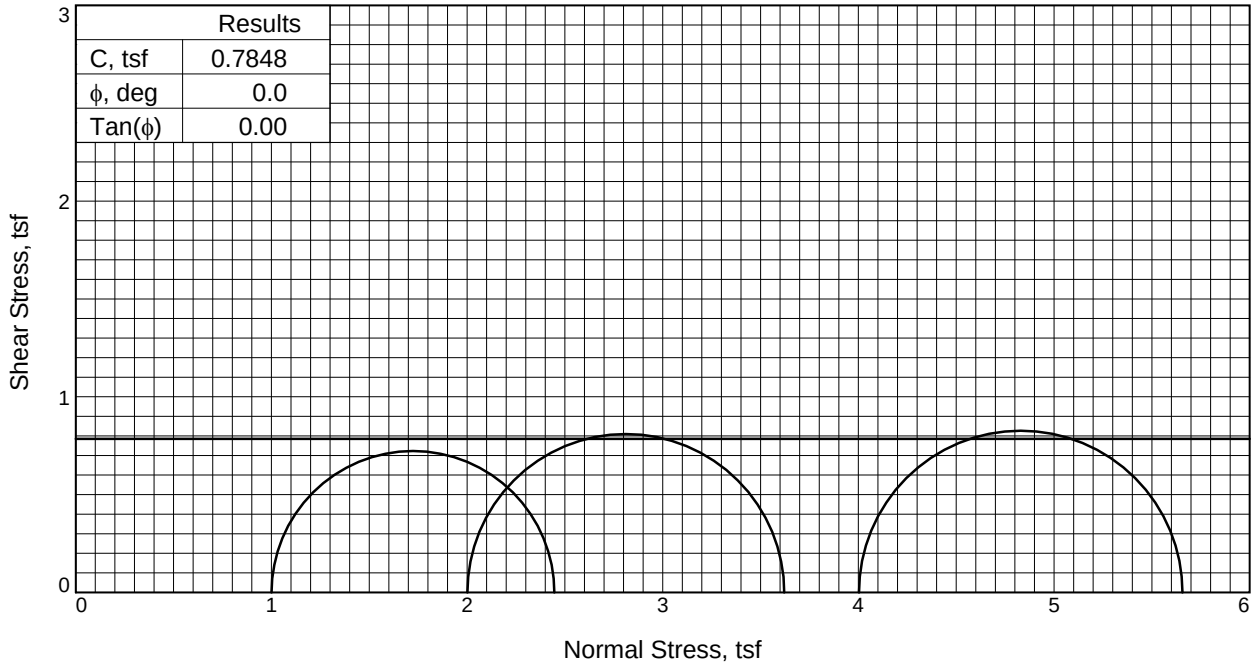
Client: Vernon County Solid Waste & Recycling Department

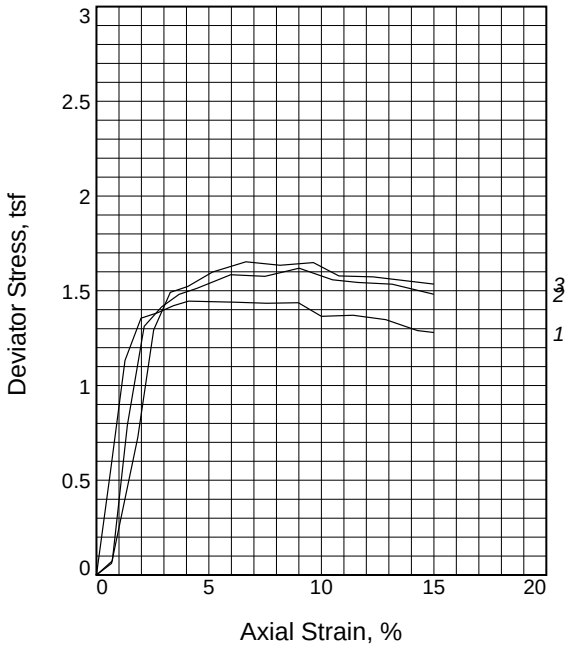
Project: Vernon County Landfill

Source of Sample: B-20 **Sample Number:** 522628

Project No.: B2205032 **Figure** _____

Braun Intertec





Sample No.		1	2	3
Initial	Water Content, %	24.8	24.8	24.8
	Dry Density, pcf	96.3	95.7	96.3
	Saturation, %	90.7	89.3	90.7
	Void Ratio	0.7303	0.7422	0.7307
	Diameter, in.	1.436	1.430	1.430
	Height, in.	2.830	2.830	2.830
At Test	Water Content, %	27.4	27.8	27.4
	Dry Density, pcf	96.3	95.7	96.3
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.7303	0.7422	0.7307
	Diameter, in.	1.436	1.430	1.430
	Height, in.	2.830	2.830	2.830
Strain rate, %/min.		1.00	1.00	1.00
Back Pressure, tsf		0.000	0.000	0.000
Cell Pressure, tsf		1.001	2.002	4.003
Fail. Stress, tsf		1.445	1.619	1.653
Ult. Stress, tsf		1.280	1.482	1.535
σ_1 Failure, tsf		2.446	3.621	5.656
σ_3 Failure, tsf		1.001	2.002	4.003

Type of Test:
Unconsolidated Undrained

Sample Type: Remold

Description: Fat Clay (CH), brown

Assumed Specific Gravity= 2.67

Remarks: UU Triax ASTM D 2850

Figure _____

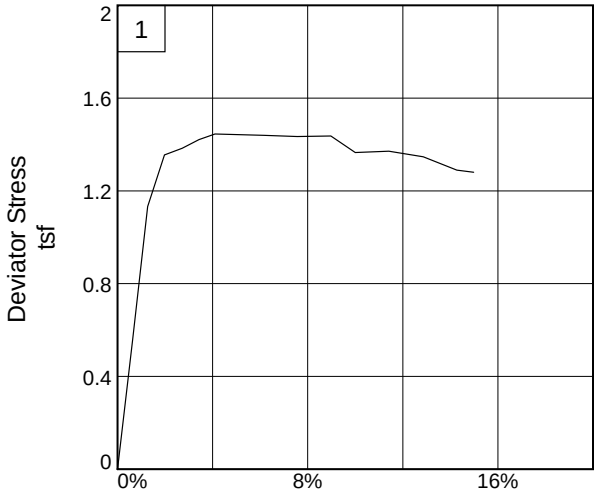
Client: Vernon County Solid Waste & Recycling Department

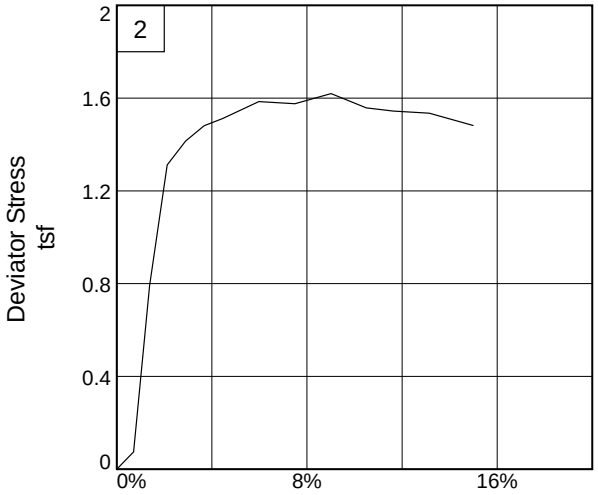
Project: Vernon County Landfill
S3705 County Road LF, Viroqua, WI

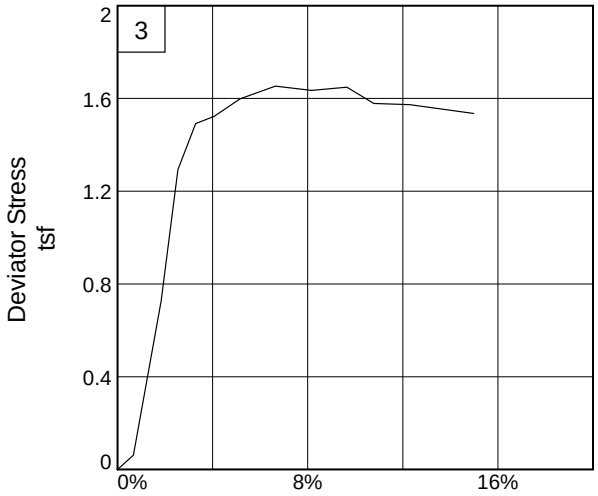
Source of Sample: B-19

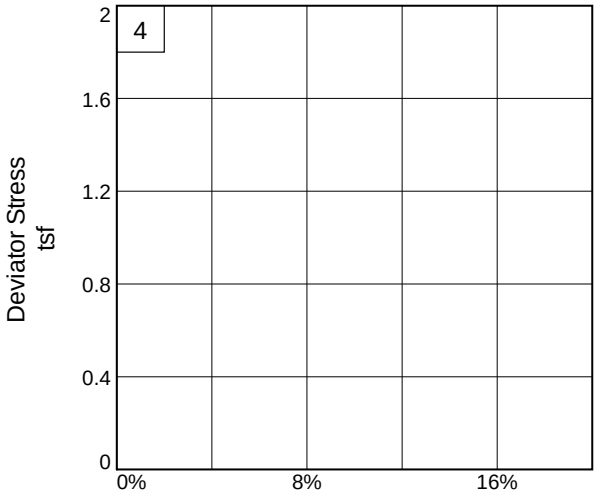
Proj. No.: B2205032 **Date Sampled:**

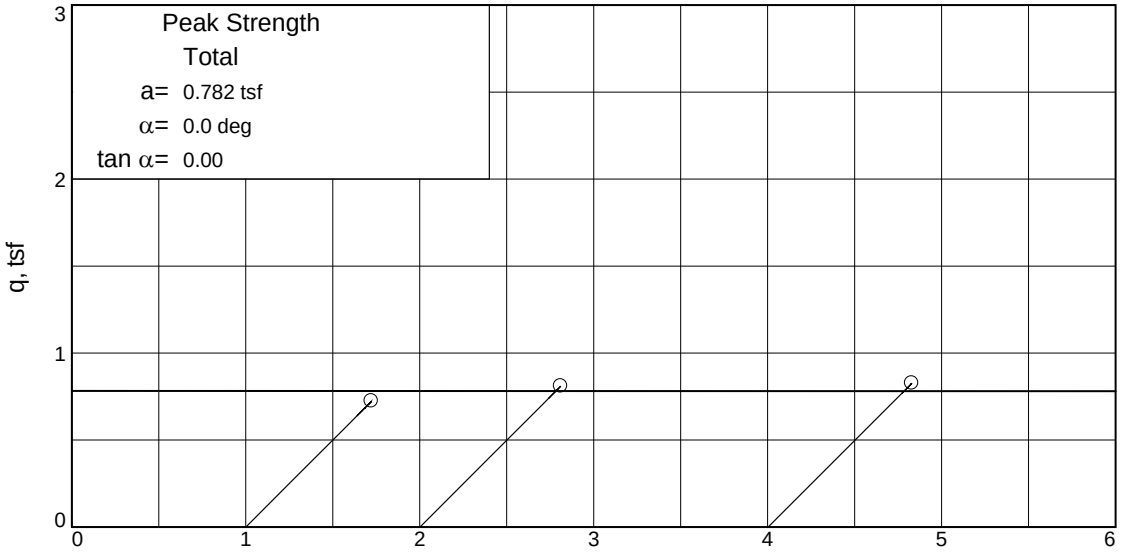
BRAUN INTERTEC











Stress Paths: o indicates peak

Client: Vernon County Solid Waste & Recycling Department

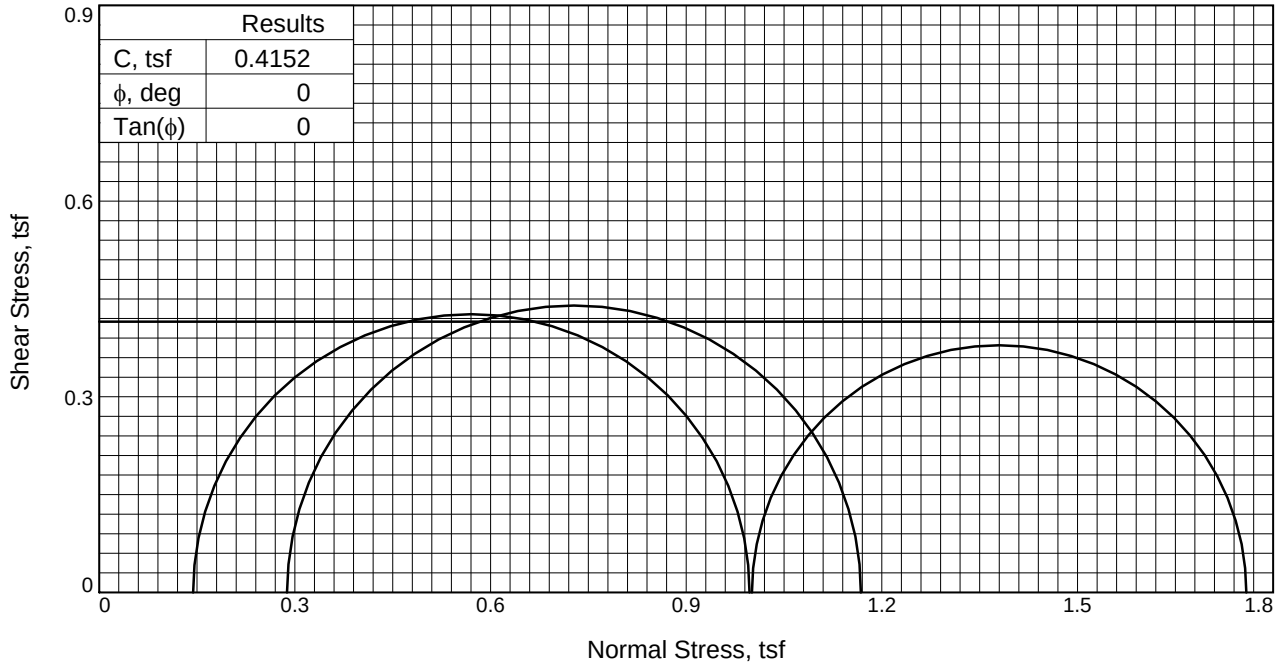
Project: Vernon County Landfill

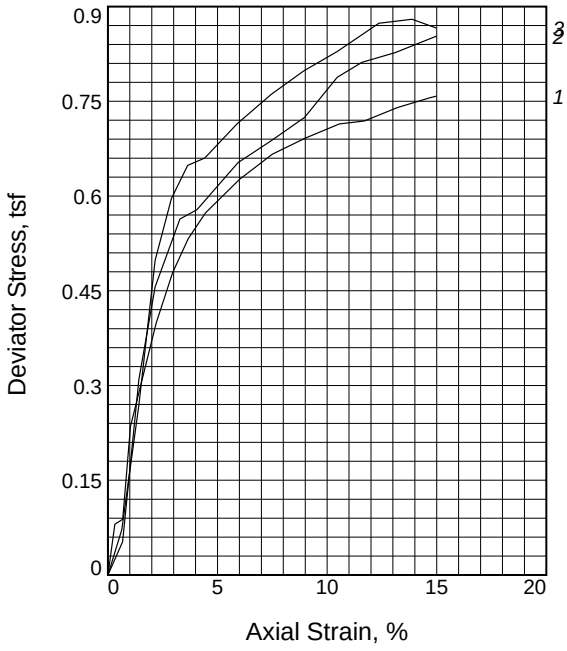
Source of Sample: B-19

Project No.: B2205032

Figure _____

Braun Intertec





Sample No.		1	2	3
Initial	Water Content, %	25.7	25.5	25.8
	Dry Density, pcf	95.2	94.7	94.8
	Saturation, %	92.0	90.2	91.4
	Void Ratio	0.7443	0.7531	0.7517
	Diameter, in.	1.430	1.430	1.420
	Height, in.	2.813	2.830	2.832
At Test	Water Content, %	28.0	28.3	28.3
	Dry Density, pcf	95.2	94.7	94.8
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.7443	0.7531	0.7517
	Diameter, in.	1.430	1.430	1.420
	Height, in.	2.813	2.830	2.832
Strain rate, %/min.		1.00	1.00	1.00
Back Pressure, tsf		0.000	0.000	0.000
Cell Pressure, tsf		1.001	0.144	0.288
Fail. Stress, tsf		0.758	0.853	0.880
Ult. Stress, tsf		0.758	0.853	0.866
σ_1 Failure, tsf		1.759	0.997	1.168
σ_3 Failure, tsf		1.001	0.144	0.288

Type of Test:
Unconsolidated Undrained

Sample Type: Remold

Description: Sandy Lean Clay (CL), brown

Assumed Specific Gravity= 2.66

Remarks: UU Triax ASTM D 2850

Figure _____

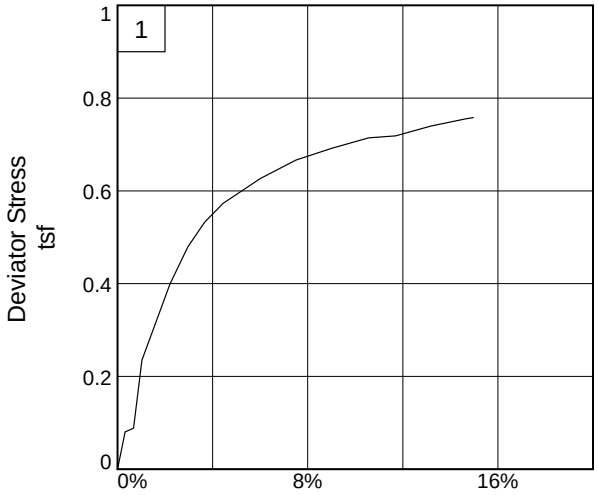
Client: Vernon County Solid Waste & Recycling Department

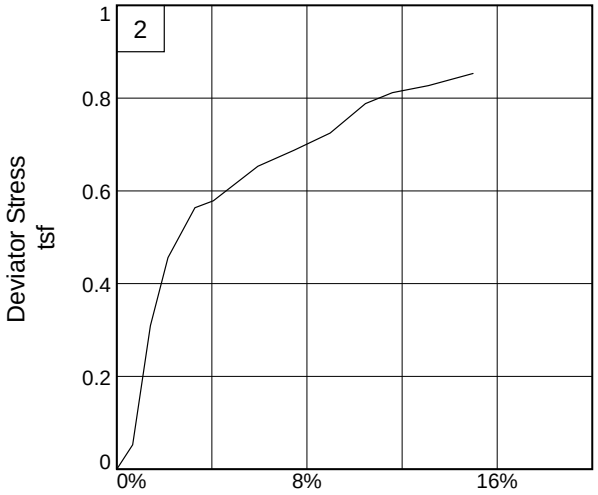
Project: Vernon County Landfill
S3705 County Road LF, Viroqua, WI

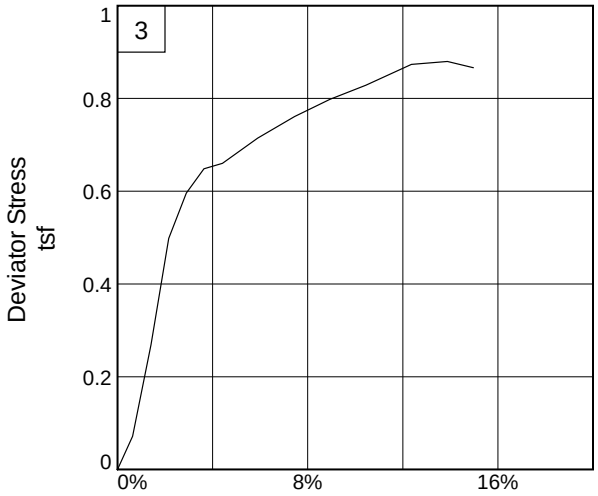
Source of Sample: B-20

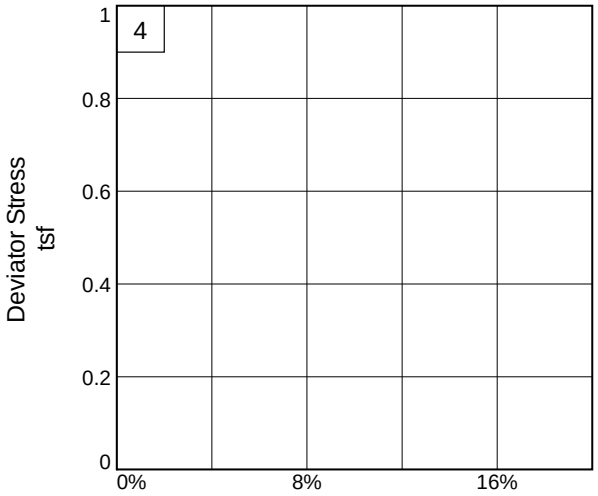
Proj. No.: B2205032 **Date Sampled:**

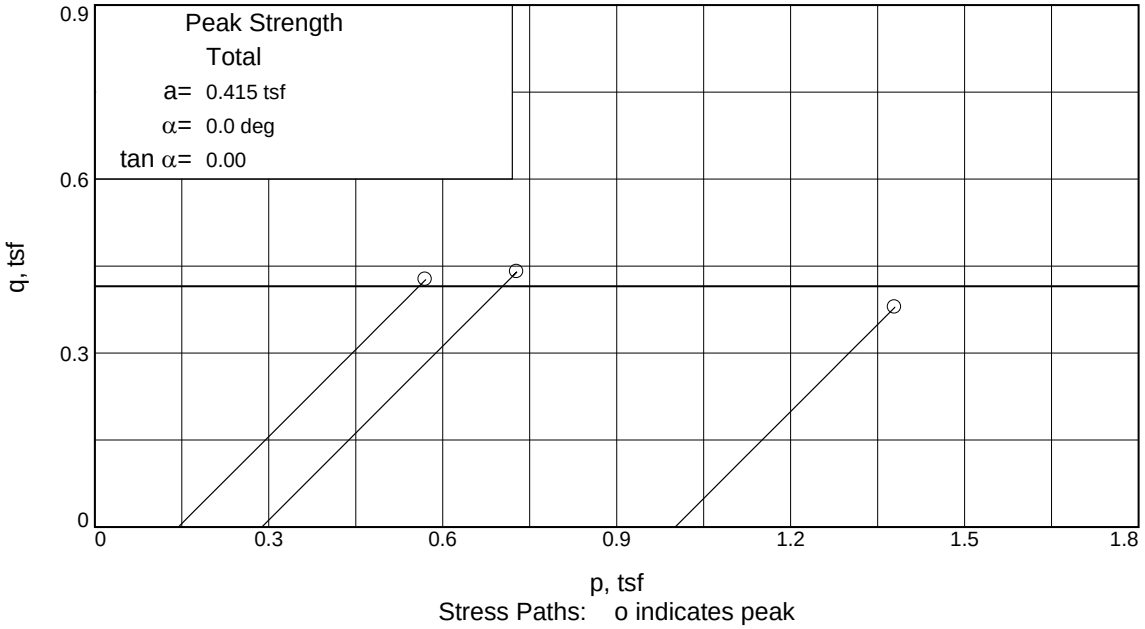
BRAUN INTERTEC











Stress Paths: o indicates peak

Client: Vernon County Solid Waste & Recycling Department

Project: Vernon County Landfill

Source of Sample: B-20

Project No.: B2205032

Figure _____

Braun Intertec

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Volume 4 of 4

Feasibility Report - Proposed Eastern Expansion (WDNR License No. 3268)

Vernon County Landfill

Viroqua, Wisconsin

VERSW 167824 | September 11, 2023

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Appendix M

Groundwater Monitoring Well and Point Information

State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

GROUNDWATER MONITORING WELL AND POINT INFORMATION

Form 4400-089 (R 04/19)

Use the Groundwater Monitoring Well and Point Information Form to record identification, location and construction information for groundwater monitoring wells and any other sample "points," (e.g., gas probes, lysimeters, leachate collection systems, etc.), that are part of the environmental monitoring program. **NOTE:** Not all fields will be applicable to all point types. Only **one** coordinate reference system may be used per site. Allowable coordinate systems are listed below. (Coordinates for each system require a minimum number of digits as described below.) Local grid coordinates cannot be accepted. Identify the Coordinate Reference System, Datum and Method used.

Facility Name	County	Facility ID No. (FID)	License, Permit or Monitoring No.	Date	Completed By (Name and Firm)
Vernon County MSW Landfill	Vernon	663038310	3268	04/11/2023	Brian Kent, SEH

DNR Point ID No.	Point Name[1]	WUWN[2] (if app.)	Type	Status	Gradient	*Enf. Stds. Y/N.*	Construction Date	Elevations msl (ft)		Well Casing			Well Screen Length (ft)	Well (Pt) Total Length[5] (ft)	Coordinates[6,7,8,9]	
								Ground Surface	Well Top (of casing)	Type	Diam[3] (in)	Length[4] (ft)			Y / Lat / Northing	X / Long / Easting
102	MW-1P		11	A			12/30/1987	1236.4	1238.41	P	2	101.1	10	111.1	1745957.3	582809.9
101	MW-1		12	A			12/30/1987	1236.4	1238.11	P	2	148.0	10	158.0	1745978.9	582815.9
121	MW-1PR		11	A			01/12/1994	1245.0	1247.61	P	2	112.7	15	127.7	1745694.8	582942.0
120	MW-1R		12	A			01/12/1994	1244.6	1247.25	P	2	149.6	15	164.6	1745703.8	582940.8
123	MW-1RZ		12	A			03/12/2003	1244.0	1245.45	P	2	181.5	5	186.5	1745693.6	582921.9
104	MW-2P		11	A			01/17/1988	1252.5	1254.88	P	2	114.8	10	124.8	1745476.5	583625.4
103	MW-2		12	A			01/17/1988	1252.5	1254.35	P	2	164.6	10	174.6	1745492.0	583625.4
105	MW-3		12	A			02/02/1988	1233.0	1235.25	P	2	175.0	5	180.0	1746427.4	584086.5
107	MW-4P		11	A			01/29/1988	1232.9	1235.19	P	2	85.0	10	95.0	1746438.4	584086.2
109	MW-5A		11	A			11/08/1989	1224.0	1225.18	P	2	88.3	15	103.3	1746571.9	583467.8
108	MW-5		12	A			02/17/1988	1223.3	1225.32	P	2	140.6	10	150.6	1746588.2	583467.9
110	MW-6		12	A			02/20/1988	1233.0	1235.37	P	2	197.2	5	202.2	1746417.4	584086.7
111	MW-7		12	A			11/07/1989	1255.7	1258.03	P	2	229.5	5	234.5	1745887.7	583843.8
112	MW-8R		12	A			11/13/1989	1256.1	1258.84	P	2	187.5	15	202.5	1745874.1	583836.9
113	MW-9		11	A			08/29/1989	1255.4	1257.50	P	2	111.8	15	126.8	1745892.2	583858.6
114	MW-10		12	A			09/15/1989	1215.6	1217.52	P	2	178.5	5	183.5	1746433.1	582822.1
115	MW-11		12	A			09/22/1989	1216.4	1218.36	P	2	147.5	15	162.5	1746431.9	582806.2
116	MW-12		11	A			09/22/1989	1216.4	1218.36	P	2	83.5	15	98.5	1746413.0	582806.6
117	MW-13P		11	A			02/26/2003	1224.5	1227.42	P	2	87.4	15	102.4	1746035.5	582910.4
118	MW-14	JX072	12	A			03/12/2003	1247.5	1249.69	P	2	171.1	15	186.1	1746475.7	583881.3
119	MW-14Z	JX073	12	A			03/07/2003	1247.5	1250.22	P	2	205.8	5	210.8	1746488.0	583866.9
125	MW-14WT	WC334	11	A			09/20/2022	1247.2	1249.70	P	2	90.0	15	105.0	1746693.0	583964.7
127	MW-15WT	WC335	11	A			09/28/2022	1220.6	1223.24	P	2	72.8	10	82.8	1746728.6	583598.0

Completion of this form is mandatory under chs. 281, 289 and 292, Wis. Stats., and ss. NR 110.25, NR 507.14 and NR 716.15, Wis. Admin. Code

GROUNDWATER MONITORING WELL AND POINT INFORMATION

Form 4400-089 (R 04/19)

DNR Point ID No.	Point Name[1]	WUWN[2] (if app.)	Type	Status	Gradient	*Enf. Stds. Y/N.*	Construction Date	Elevations msl (ft)		Well Casing			Well Screen Length (ft)	Well (Pt) Total Length[5] (ft)	Coordinates[6,7,8,9]	
								Ground Surface	Well Top (of casing)	Type	Diam[3] (in)	Length[4] (ft)			Y / Lat / Northing	X / Long / Easting
129	MW-16WT	WC336	11	A			09/21/2022	1184.7	1187.41	P	2	64.9	10	74.9	1746673.3	583157.3
131	MW-16	WC337	12	A			08/25/2022	1184.3	1186.92	P	2	91.9	5	96.9	1746669.6	583147.8
133	MW-17WT	WC338	11	A			09/26/2022	1196.4	1199.18	P	2	76.9	10	86.9	1746684.9	582907.9
FU046	P-1 (Facility)	201	13	A			12/10/1992			S	6					
8IW730	P-2 (Williams)	202	13	A			07/10/1969			S	6					
	Sedimentation Basin	502	22	A												
	Leachate Storage Tank	300	23	A											1745623.2	583001.6
	Lys-1	340	14	A											1745918.7	1745918.7
	Lys-2	341	14	A											1746103.3	582916.5
	Lys-3	342	14	A											1746261.9	582892.9
	LHW-1	310	24	A											1745934.8	583130.8
	LHW-2	314	24	A											1745941.7	583452.2
	LHW-3	318	24	A											1746129.7	583120.3
	LHW-4	322	24	A											1746077.0	583793.7
	LHW-5	326	24	A											1746365.6	583124.4
	LHW-6	330	24	A											1746372.4	583461.2
	GP-1	460	51	A											1745680.9	583357.5
	GP-2	462	51	A											1745951.2	583821.2
	GP-3	464	51	A											1746000.6	582918.3

GROUNDWATER MONITORING WELL AND POINT INFORMATION

[1] Include previous name as well if one exists.

[2] Wisconsin Unique Well Number.

[3] Well Casing Diameter measures inside diameter.

[4] Length of well casing from top of casing to top of screen.

[5] Total length of well from top of casing to bottom of well. *Should equal sum of well casing length and screen length.*

[6] Identify Coordinate Reference System (only one system may be used per site):

- ◯ Lat/Long (Decimal Degrees) WGS84 (min. 8 digits total w/ 6 right of decimal, e.g., -89.123456)

State Plane (min. 2 digits right of decimal)

- ◯ North
- ◯ Central
- ⊗ South
- ◯ Wisc. Transverse Mercator WTM91 (min. 2 digits right of decimal)
- ◯ Local County Coord. Sys. (WISCRS) (min. digits vary by county)

[7] Identify Projection Datum and units*

- ◯ NAD83
- ◯ NAD27
- ◯ NAD83(91)
- ⊗ NAD83(11)
- ◯ Other Describe: _____

Units used for State Plane, WTM or County Coord. Sys:

- ◯ meters
- ◉ feet

*NOTE: A datum and units are not required for Lat/Long

[8] Identify the Method Used to Determine the Coordinates:

- ⊗ GPS001-Survey grade
- ◯ GPS003-Mapping grade/real-time differential correction
- ◯ GPS004-Mapping grade/post processing
- ◯ SRV001-Classical terrestrial surveying techniques
- ◯ OTH001 (Other), Describe:

[9] Y / Lat / Northing describe the vertical axis.

X / Long / Easting describe the horizontal axis.

(include "-" where needed, e.g., -89.123456)

Remarks:

Completion of this form is mandatory under chs. 281, 289 and 292, Wis. Stats., and ss. NR 110.25, NR 507.14 and NR 716.15, Wis. Admin. Code

INSTRUCTIONS FOR COMPLETING THE GROUNDWATER MONITORING WELL AND POINT INFORMATION FORM (#4400-089)

When completed, this form provides a record of information for each well or sampling point that is part of a facility's environmental monitoring program. It provides the facility or consultant with a means of presenting point information required by the Department in a consistent format. This form should be updated as new points are added to the monitoring program or new information becomes available (e.g., re-surveyed elevation for existing points).

Complete the form with the necessary information as described below:

Facility Name: Enter the name of the site or landfill.

County: Enter the county the site or landfill is located.

Facility ID Number (FID): Enter the 9-digit Facility ID (FID) assigned to the site.

License/Permit/Monitoring Number: Enter the number assigned by the Department to the facility. If unknown, leave blank.

Date: Enter the date on which the form is completed (mm/dd/yyyy).

Completed By: Enter the name and firm of person completing the form.

DNR Point ID Number: Enter the 3-digit number assigned to the point by the Department, for use by the Department.

Point Name: Enter the common name given to the point by the facility or consultant; e.g. MW-2, GP-5. If the point had a previous name, please include and identify as such.

Wisconsin Unique Well Number (WUWN): Enter the Wisconsin Unique Well Number assigned to groundwater monitoring and private wells. WUWNs are available from the Department and are to be assigned to all newly installed monitoring and private wells.

Type: Enter the Numerical code describing the type of well or sampling point. Point type codes range from 11 to 99. *See list of Point Types beginning on page 4.*

Status: Enter the status of the well using the following codes:

A	–	**A**ctively monitored point
I	–	**I**nactive point (existing point not currently being monitored)
P	–	**P**ermanently abandoned point
L	-	P**L**anned.

INSTRUCTIONS FOR COMPLETING THE GROUNDWATER MONITORING WELL AND POINT INFORMATION FORM (#4400-089)

Gradient Position: Enter the location of the well in the groundwater flow system relative to the disposal site, spill, etc. *Use one of the six letters designated below. If gradient position is not known or does not apply to the type of point, leave blank.*

U = Up gradient	D = Down gradient	Y = Side-to-down gradient
S = Side gradient	X = Side-to-up gradient	N = Not known

Enf. Stds. Apply: Enter "Y" if enforcement standards apply at this well. Enforcement standards apply to any well beyond the **D**esign **M**anagement **Z**one (DMZ) or the property boundary of the facility or to a water supply well. For spills, enforcement standards apply at every point at which groundwater is monitored. (For more information, see s. NR 140.22, Wis. Adm. Code.) *If the application of enforcement standards is not relevant to the type of point entered, leave blank.*

Construction Date: Enter the installation date of the point.

Elevations:

Ground Surface: The elevation, in feet, of the ground surface adjacent to the well using mean sea level (MSL) based on national geodetic vertical survey (i.e., NAVD88).

Well Top (of casing): The elevation, of the top of the well casing (not top of protective pipe), in feet using MSL based on national geodetic vertical survey (i.e., NAVD88).

Well Casing:

Type: The type of pipe used: plastic (P), steel (S), or other (O).

Diam: The inside diameter of the pipe used in the well construction, in inches.

Length: The length of the well casing from the top of the casing to the top of the screen, measured in feet.

Well Screen Length: The length of the screen measured in feet.

Well (Point) Total Length: The total length of the well (or point) from the top of the casing to the bottom of the well, measured in feet. *Should equal sum of well casing length and screen length.*

Point Coordinate Reference Systems: Only one coordinate reference system may be used on the form. Allowable coordinate systems are Lat/Long (in decimal degrees [DD] only), State Plane and Wisconsin Transverse Mercator (WTM91). County coordinate systems (WISCRS) may also be used. Local grid coordinates are *not* accepted. The field named "Y / Lat / Northing" describe the vertical axis and the field "X / Long / Easting" describe the horizontal axis.

INSTRUCTIONS FOR COMPLETING THE GROUNDWATER MONITORING WELL AND POINT INFORMATION FORM (#4400-089)

Identify the coordinate reference system used:

- Latitude/Longitude WGS84 (Decimal Degrees, minimum 8 digits total w/ 6 right of decimal)
- State Plane (min. 2 digits right of decimal):
  - North
  - Central
  - South
- Wisc. Transverse Mercator (WTM91, min. 2 digits right of decimal)
- Local County Coordinate System (aka Wisconsin Coordinate Reference System (WISCRS), minimum digits vary by county)

Identify the projection datum used (listed below) by checking the appropriate box on the bottom of the form. NOTE: A datum is not required for Lat/Long.

- NAD83
- NAD27
- NAD83(91)
- NAD83(11)
- Other

Identify the units used, meters or feet, for State Plane, WTM or Local County Coordinate System.

Identify the method used to determine the coordinates by checking the appropriate box on the bottom of the form. The options are:

- GPS001-Survey grade GPS
- GPS003-Mapping grade GPS with real-time differential correction
- GPS004-Mapping grade GPS with post processing differential correction
- SRV001-Classical terrestrial surveying techniques
- OTH001 (Other)

Remarks: Include any comments applicable to the submittal (e.g., Re-surveyed top of well casing elevation).

List of Point Types

11 (mw) Water table observation well (monitoring well screen intersecting the water table) (non-Subtitle D well)
12 (pz) Piezometer (monitoring well with screen sealed below the water table (non-Subtitle D well)
13 (pw) Private well - potable water supply
14 (ly) Lysimeter
15 (sp) Spring
16 (rp) Resistivity probe
17 (gc) Gradient control
18 (at) Aquifer test well
19 (pn) Private well-non potable
21 (fs) Flow or seep
22 (sw) Surface water
23 (lc) Leachate collection system
24 (lh) Leachate head well
25 (lg) Leachate and gas combo
26 (ew) Groundwater extraction well
27 (he) Horizontal groundwater extraction well

INSTRUCTIONS FOR COMPLETING THE GROUNDWATER MONITORING WELL AND POINT INFORMATION FORM (#4400-089)

28 (hw) Horizontal monitoring well
29 (ha) Horizontal vapor extraction well
31 (us) Upstream
32 (ms) Mid-site
33 (ds) Downstream
34 (ro) Run-off
35 (im) Impounded
36 (sg) Staff gauge
41 (tr) Treated
42 (pr) Pretreated
45 (pp) Private well primary treatment
46 (ps) Private well secondary treatment
49 (sh) Settlement hub
51 (gp) Gas probe
52 (nl) Non-landfill structure
53 (ge) Gas extraction system
54 (gu) Gas utilization or destruction
55 (gc) Gas condensate
56 (sc) Site conditions collection
57 (sv) Soil venting well (includes both soil vapor extraction and bioventing, includes both extraction and unsaturated zone gas phase injection wells installed in soil or fill, but not refuse)
58 (gm) Gas sample monitoring point
59 (sc) Stone column gas extraction well
61 (ij) Injection well (injection of liquids not gases)
62 (as) In situ air sparging well (injection well to inject gases into the aquifer
63 (uv) Unterdruck Verdampfer Brunnen (UVB) wells (sparging wells where the gases remain in the well and are not injected into the aquifer)
64 (le) Groundwater and light non-aqueous phase liquid (LNAPL) extraction well
65 (de) Groundwater and dense non-aqueous phase liquid (DNAPL) extraction well
66 (ve) Vacuum enhanced groundwater extraction wells
67 (vi) Vacuum enhanced groundwater and LNAPL extraction well
68 (vd) Vacuum enhanced groundwater and DNAPL extraction well
71 (dw) Subtitle D water table observation well (see 11/mw)
72 (dp) Subtitle D piezometer (see 12/pz)
80 (mc) Municipal water supply well: cities, villages, and sanitary districts
81 (oc) Community-other-than-municipal (OTM) water supply well: mobile home parks, apartments, subdivisions, and condominium complexes
85 (nn) Noncommunity-Nontransient water supply well (schools, day care centers, and industries) A Noncommunity water system that regularly serves at least 25 of the same persons over 6 months per year
86 (tn) Noncommunity-Transient water supply well (motels, restaurants, parks, taverns, churches, and campgrounds) A Noncommunity water system that serves at least 25 people at least 60 days of the year
99 (ot) Other

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Appendix N

Well Construction Logs within 300 feet of Proposed Expansion

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY	Local Grid Location of Well: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.	Well Name: MW-3
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. _____ Long. _____ or St. Plane _____ ft. N, _____ ft. E.	Wis. Unique Well Number / DNR Well Number
Type of Well: Water Table Observation Well ☐ 11; Piezometer ■ 12	Section Location of Waste/Source: NW 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4 ☐ E. ☒ W.	Date Well Installed: 02/01/88 (m m d d y y)
Distance Well Is From Waste/Source Boundary: _____ ft.	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient; d ☐ Downgradient n ☐ Not Known	Well Installed By: (Person's Name and Firm): ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No		

A. Protective pipe, top elevation 1235.39 ft. MSL
B. Well casing, top elevation 1235.37 ft. MSL
C. Land surface elevation 1233.1 ft. MSL
D. Surface seal, bottom 1228.1 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ■

13. Sieve analysis attached? ☐ Yes ■ No

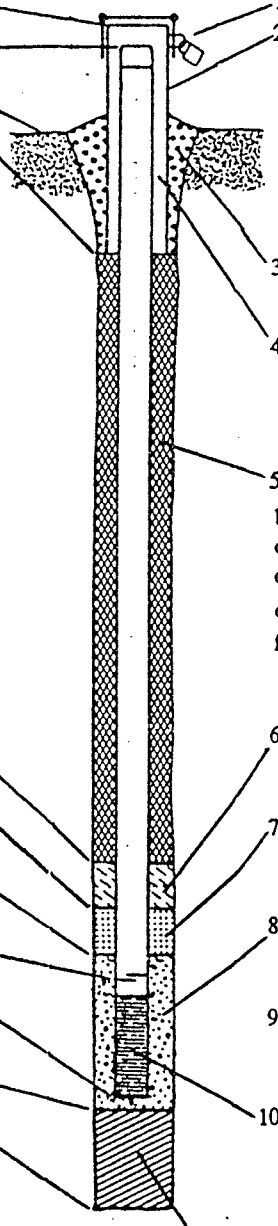
14. Drilling method used: Rotary ■ 50; Hollow Stem Auger ☐ 41; Other ☐ ___ _____

15. Drilling fluid used: Water ☐ 02; Air ■ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ■ Yes ☐ No
Describe QUIK FOAM

17. Source of water (attach analysis):
HILLSBORO CITY WATER

E. Bentonite seal, top 1071.1 ft. MSL or 161.4 ft.
F. Fine sand, top _____ ft. MSL or _____ ft.
G. Filter pack, top 1061.2 ft. MSL or 165.9 ft.
H. Screen joint, top 1058.2 ft. MSL or 174.9 ft.
I. Well bottom 1053.2 ft. MSL or 179.9 ft.
J. Filter pack, bottom _____ ft. MSL or _____ ft.
K. Borehole, bottom 1053.1 ft. MSL or 180.0 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.80 in.



1. Cap and lock? ■ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 4.0 ft.
c. Material: Steel ■ 04; Other ☐ ___ _____
d. Additional protection? ☐ Yes ■ No
If yes, describe: _____
3. Surface seal: Bentonite ☐ 30; Concrete ■ 01; Other ☐ ___ _____
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ ___; Other ☐ ___ _____
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 50 % Bentonite . . . . . Bentonite-cement grout ■ 50
e. 53.74 Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ■ 02; Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☐ 3/8 in. ■ 1/2 in. Bentonite pellets ☐ 32
c. VOLCLAY Other ☐ ___ _____
7. Fine sand material: Manufacturer, product name & mesh size
a. _____ ___ ___
b. Volume added _____ ft³
8. Filter pack material: Manufacturer, product name and mesh size
a. SAND ___ ___
b. Volume added 8.1 ft³
9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ■ 24; Other ☐ ___ _____
10. Screen material: PVC SCH 80 ___ ___
a. Screen type: Factory cut ■ 11; Continuous slot ☐ 01; Other ☐ ___ _____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: ___.__ ft.
11. Backfill material (below filter pack): None ☐ 14; Other ☐ ___ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: William R Vach | Firm: CENTRAL WISCONSIN ENGINEERS INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY

Facility License, Permit or Monitoring Number: _____

Type of Well: Water Table Observation Well ■ 11 ☐ Piezometer ☐ 12

Distance Well Is From Waste/Source Boundary: _____ ft.

Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No

Local Grid Location of Well: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Grid Origin Location: Lat. _____ Long. _____ or

St. Plane _____ ft. N, _____ ft. E.

Section Location of Waste/Source: NW 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4 ☐ E. ■ W.

Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known

Well Name: MW-4

Wis. Unique Well Number: _____ DNR Well Number: _____

Date Well Installed: 01/28/88 (m m d d y y)

Well Installed By: (Person's Name and Firm): ACE WELL

A. Protective pipe, top elevation 1235.31 ft. MSL

B. Well casing, top elevation 1235.01 ft. MSL

C. Land surface elevation 1233.2 ft. MSL

D. Surface seal, bottom 1228.2 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ■

13. Sieve analysis attached? ☐ Yes ■ No

14. Drilling method used: Rotary ■ 50; Hollow Stem Auger ☐ 41; Other ☐ _____

15. Drilling fluid used: Water ☐ 02; Air ■ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ■ Yes ☐ No

Describe QUICK FOAM

17. Source of water (attach analysis):
HILLSBORO CITY WELL

E. Bentonite seal, top 1099.7 ft. MSL or 133.5 ft.

F. Fine sand, top _____ ft. MSL or _____ ft.

G. Filter pack, top 1096.9 ft. MSL or 136.3 ft.

H. Screen joint, top 1089.2 ft. MSL or 144.0 ft.

I. Well bottom 1079.2 ft. MSL or 154.0 ft.

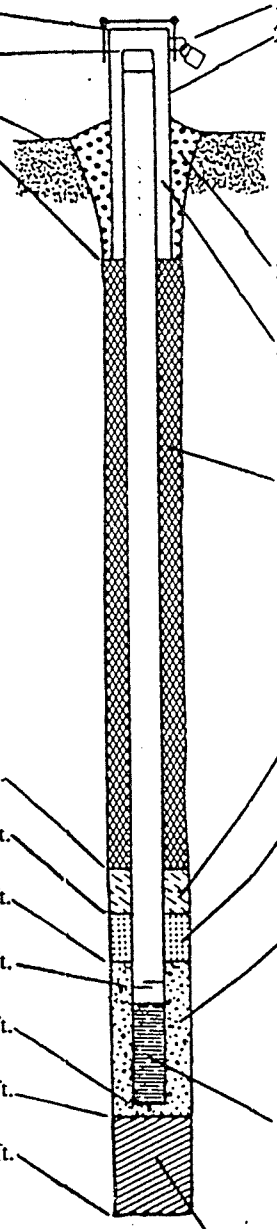
J. Filter pack, bottom _____ ft. MSL or _____ ft.

K. Borehole, bottom 1073.2 ft. MSL or 160.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 2.00 in.



1. Cap and lock? ■ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 1.0 ft.
c. Material: Steel ■ 04; Other ☐ _____
d. Additional protection? ☐ Yes ■ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ■ 01; Other ☐ _____

4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ _____; Other ☐ _____

5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
d. 50 % Bentonite ..... Bentonite-cement grout ■ 50
e. 26.7 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ■ 02; Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☐ 3/8 in. ■ 1/2 in. Bentonite pellets ■ 32
c. VOLCLAY Other ☐ _____

7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft^3

8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 5.4 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ■ 24; Other ☐ _____

10. Screen material: PVC Sch 80
a. Screen type: Factory cut ■ 11; Continuous slot ☐ 01; Other ☐ _____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.

11. Backfill material (below filter pack): None ☐ 14; Other ☐ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: William R Vach Firm: CENTRAL WISCONSIN ENGINEERS.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY

Facility License, Permit or Monitoring Number: _____

Type of Well: Water Table Observation Well ■ 11; Piezometer ☐ 12

Distance Well Is From Waste/Source Boundary: _____ ft.

Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No

Local Grid Location of Well: _____ ft. ☐N ☐S _____ ft. ☐E ☐W

Grid Origin Location: Lat. _____ Long. _____ or

St. Plane _____ ft. N, _____ ft. E.

Section Location of Waste/Source: NW 1/4 of SE 1/4 of Sec. 15 T. 13 N, R. 4 ☐E ■W

Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient; d ☐ Downgradient n ☐ Not Known

Well Name: MW-4P

Wis. Unique Well Number: _____ DNR Well Number: _____

Date Well Installed: 01/28/88 (m m d d y y)

Well Installed By: (Person's Name and Firm): ACE WELL

A. Protective pipe, top elevation 1235.31 ft. MSL

B. Well casing, top elevation 1235.19 ft. MSL

C. Land surface elevation 1233.2 ft. MSL

D. Surface seal, bottom 1228.2 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ■

13. Sieve analysis attached? ☐ Yes ■ No

14. Drilling method used: Rotary ■ 50; Hollow Stem Auger ☐ 41; Other ☐ ____

15. Drilling fluid used: Water ☐ 02; Air ■ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ■ Yes ☐ No

Describe QUICK FOAM

17. Source of water (attach analysis):
HILLSBORO CITY WATER

E. Bentonite seal, top 1159.1 ft. MSL or 74.1 ft.

F. Fine sand, top _____ ft. MSL or _____ ft.

G. Filter pack, top 1156.1 ft. MSL or 77.1 ft.

H. Screen joint, top 1148.3 ft. MSL or 84.9 ft.

I. Well bottom 1138.3 ft. MSL or 94.9 ft.

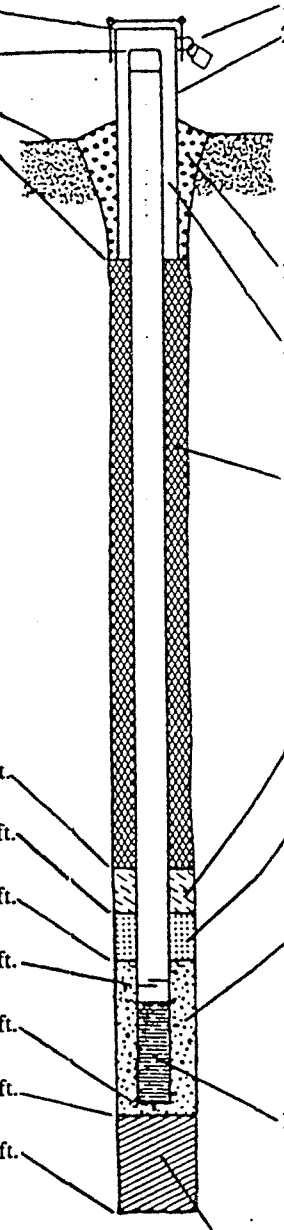
J. Filter pack, bottom _____ ft. MSL or _____ ft.

K. Borehole, bottom 1073.2 ft. MSL or 160.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 1.80 in.



1. Cap and lock? ■ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 4.0 ft.
c. Material: Steel ■ 04; Other ☐ ____
d. Additional protection? ☐ Yes ☐ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ■ 01; Other ☐ ____

4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ ____; Other ☐ ____

5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 50 % Bentonite . . . . . Bentonite-cement grout ■ 50
e. 26.7 Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ■ 02; Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ■1/2 in. Bentonite pellets ■ 32
c. VOLCLAY Other ☐ ____

7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft³

8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 12.15 ft³

9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ■ 24; Other ☐ ____

10. Screen material: PVC Sch 80
a. Screen type: Factory cut ■ 11; Continuous slot ☐ 01; Other ☐ ____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.

11. Backfill material (below filter pack): None ☐ 14; Other ☐ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: William Roach Firm: CENTRAL WISCONSIN ENGINEERS

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Vernon County

Facility License, Permit or Monitoring Number: 03 68

Grid Location: 863.8 ft. [X] N. [ ] S. — 1794.6 ft. [X] E. [ ] W.

Well Name: MW-5A

Wis. Unique Well Number: DNR Well Number:

Type of Well: Water Table Observation Well [X] 11; Piezometer [ ] 12

Section Location: SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 [ ] E [X] W

Date Well Installed: 11 / 08 / 89 (m m / d d / y y)

Distance Well Is From Waste/Source Boundary: 55' From Prop. Waste Limits ft.

Well Installed By: (Person's Name and Firm)
Gus Pech
Exploration Technology, Inc.

Is Well A Point of Enforcement Std. Application? [X] Yes [ ] No

Location of Well Relative to Waste/Source: [ ] Upgradient [X] Sidegradient [ ] Downgradient [ ] Not Known

A. Protective pipe, top elevation 1225.81 ft. MSL
B. Well casing, top elevation 1226.17 ft. MSL
C. Land surface elevation 1224.0 ft. MSL
D. Surface seal, bottom 1146.7 ft. MSL or 79.5 ft.

1. USCS classification of soil near screen:
[ ] GP [ ] GM [ ] GC [ ] GW [ ] SW [ ] SP
[ ] SM [ ] SC [ ] ML [ ] MH [ ] CL [ ] CH
[X] Bedrock

15. Sieve analysis attached? [ ] Yes [X] No

14. Drilling method used: Rotary [X] 50; Hollow Stem Auger [ ] 41; Other [ ]

13. Drilling fluid used: Water [ ] 02; Air [ ] 01; Drilling Mud [X] 03; None [ ] 99

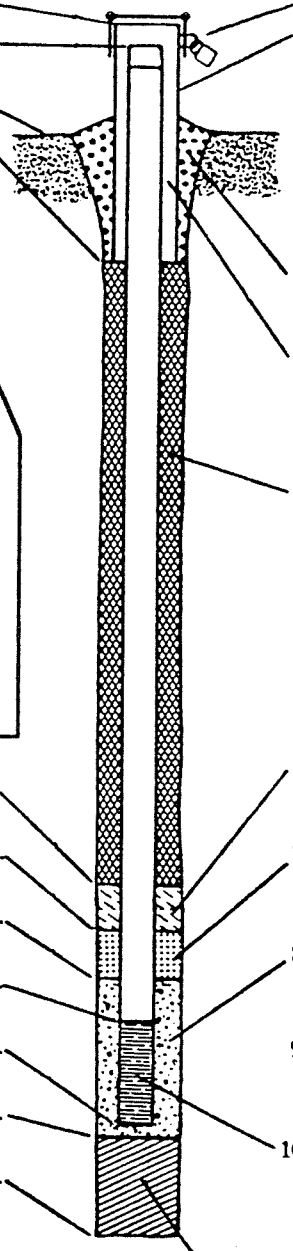
16. Drilling additives used? [X] Yes [ ] No

Describe: Foam

17. Source of water (attach analysis):
City of Viroqua Municipal Water

E. Bentonite seal, top 1146.7 ft. MSL or 79.5 ft.
F. Fine sand, top 1145.7 ft. MSL or 80.5 ft.
G. Filter pack, top 1143.7 ft. MSL or 82.5 ft.
H. Well screen, top 1137.9 ft. MSL or 88.3 ft.
I. Well screen, bottom 1122.9 ft. MSL or 103.3 ft.
J. Filter pack, bottom 1122.9 ft. MSL or 103.3 ft.
K. Borehole, bottom 1122.9 ft. MSL or 103.3 ft.

L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 2.00 in.



1. Cap and lock? [X] Yes [ ] No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel [X] 04; Other [ ]
d. Additional protection? [ ] Yes [X] No
If yes, describe:
3. Surface seal: Bentonite [X] 30; Concrete [ ] 01; Other [ ]
4. Material between well casing and protective pipe: Bentonite [X] 30; Annular space seal [ ]; Other [ ]
5. Annular space seal: Granular Bentonite [X] 33
_____ Lbs/gal mud weight ... Bentonite-sand slurry [ ] 35
_____ Lbs/gal mud weight ..... Bentonite slurry [ ] 31
_____ % Bentonite .... Bentonite-cement grout [ ] 50
13.5 Ft³ volume added for any of the above
How installed: Tremie [ ] 01; Tremie pumped [ ] 02; Gravity [X] 08
6. Bentonite seal: Bentonite granules [ ] 33
[X] 1/4 in. [ ] 3/8 in. [ ] 1/2 in. Bentonite pellets [X] 32; Other [ ]
7. Fine sand material: Manufacturer, product name and mesh size
Ottowa Sand
Volume added 0.4 ft³
8. Filter pack material: Manufacturer, product name and mesh size
Waupaca Materials No. 30 Flint
Volume added 3.5 ft³
9. Well casing: Flush threaded PVC schedule 40 [ ] 23; Flush threaded PVC schedule 80 [X] 24; Other [ ]
10. Screen material: Sch. 80 PVC
Screen type: Factory cut [X] 11; Continuous slot [ ] 01; Other [ ]
Manufacturer: Northern Air & Supply
Slot size: 0.010 in.
Slotted length: 13.5 ft.
11. Backfill material (below filter pack): None [X]; Other [ ]

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature: Kyle Thornton Firm: Central Wisconsin Engineers

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with s. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with s. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation.
NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. W. ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY	Local Grid Location of Well: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.	Well Name: MW-5
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. _____ Long. _____ or	Wis. Unique Well Number / DNR Well Number: _____
Type of Well: Water Table Observation Well ■ 11; Piezometer ☐ 12	St. Plane _____ ft. N, _____ ft. E.	Date Well Installed: 02/16/88 (m m d d y y)
Distance Well Is From Waste/Source Boundary: _____ ft.	Section Location of Waste/Source: SW 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4 ☐ E. ■ W.	Well Installed By: (Person's Name and Firm): ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	

A. Protective pipe, top elevation 1226.50 ft. MSL
B. Well casing, top elevation 1225.32 ft. MSL
C. Land surface elevation 1223.2 ft. MSL
D. Surface seal, bottom 1218.2 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ■

13. Sieve analysis attached? ☐ Yes ■ No

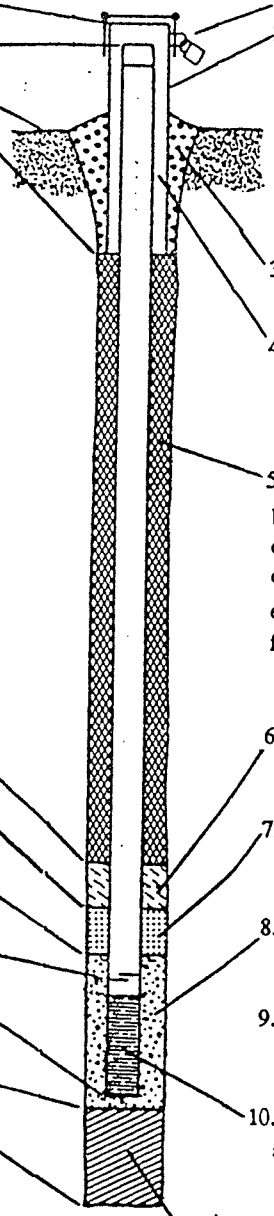
14. Drilling method used: Rotary ■ 50; Hollow Stem Auger ■ 41; Other ☐ _____

15. Drilling fluid used: Water ☐ 02; Air ■ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ■ Yes ☐ No
Describe QUICK FOAM

17. Source of water (attach analysis):
HILLSBORO CITY WATER

E. Bentonite seal, top 1102.6 ft. MSL or 120.6 ft.
F. Fine sand, top _____ ft. MSL or _____ ft.
G. Filter pack, top 1091.6 ft. MSL or 131.6 ft.
H. Screen joint, top 1082.6 ft. MSL or 140.6 ft.
I. Well bottom 1072.6 ft. MSL or 150.6 ft.
J. Filter pack, bottom _____ ft. MSL or _____ ft.
K. Borehole, bottom 1043.2 ft. MSL or 180.0 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.80 in.



1. Cap and lock? ■ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 5.0 ft.
c. Material: Steel ■ 04; Other ☐ _____
d. Additional protection? ☐ Yes ■ No
If yes, describe: _____
3. Surface seal: Bentonite ☐ 30; Concrete ■ 01; Other ☐ _____
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ _____; Other ☐ _____
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 50 % Bentonite . . . . . Bentonite-cement grout ■ 50
e. 40.10 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☐ 3/8 in. ■ 1/2 in. Bentonite pellets ■ 32
c. VOLCLAY Other ☐ _____
7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 18.09 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ■ 24; Other ☐ _____
10. Screen material: PVC Sch 80
a. Screen type: Factory cut ■ 11; Continuous slot ☐ 01; Other ☐ _____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☐ 14; Other ☐ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: William R Klein
Firm: CENTRAL WISCONSIN ENGINEERS, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 4-90

Facility/Project Name: VERNON COUNTY	Local Grid Location of Well: _____ ft. ☐N ☐S _____ ft. ☐E ☐W	Well Name: MW-6
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. _____ Long. _____ or St. Plane _____ ft. N, _____ ft. E.	Wis. Unique Well Number / DNR Well Number: _____ / _____
Type of Well: Water Table Observation Well ☐ 11; Piezometer ☒ 12	Section Location of Waste/Source: NW 1/4 of SE 1/4 of Sec. 15, T. 13 N, R. 4 ☐E ☒W	Date Well Installed: 02/19/88 (mm dd yy)
Distance Well Is From Waste/Source Boundary: _____ ft.	Location of Well Relative to Waste/Source: u ☐ Upgradient; s ☐ Sidegradient; d ☐ Downgradient; n ☐ Not Known	Well Installed By: (Person's Name and Firm) ACE WELL
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No		

A. Protective pipe, top elevation 1235.47 ft. MSL

B. Well casing, top elevation 1235.7 ft. MSL

C. Land surface elevation 1233.0 ft. MSL

D. Surface seal, bottom 1228.0 ft. MSL or 5.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50; Hollow Stem Auger ☐ 41; Other ☐ ____

15. Drilling fluid used: Water ☐ 02; Air ☒ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ☒ Yes ☐ No
Describe QUIK FOAM

17. Source of water (attach analysis):
HILLSBORO CITY WELL

E. Bentonite seal, top 1046.0 ft. MSL or 187.0 ft.

F. Fine sand, top _____ ft. MSL or _____ ft.

G. Filter pack, top 1042.0 ft. MSL or 191.0 ft.

H. Screen joint, top 1035.7 ft. MSL or 197.3 ft.

I. Well bottom 1025.7 ft. MSL or 2023 ft.

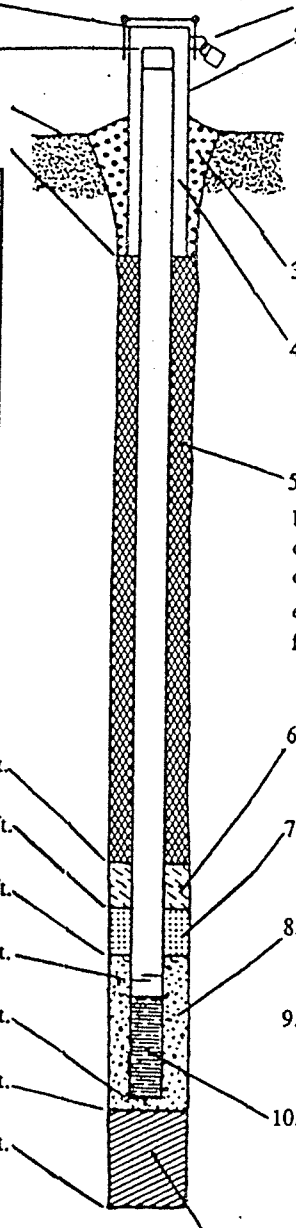
J. Filter pack, bottom _____ ft. MSL or _____ ft.

K. Borehole, bottom 1023.0 ft. MSL or 210.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 1.80 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 4.0 ft.
c. Material: Steel ☒ 04; Other ☐ ____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ ____

4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ ____; Other ☐ ____

5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
d. 50 % Bentonite ..... Bentonite-cement grout ☒ 50
e. 80.2 Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☒ 02; Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ☒1/2 in. Bentonite pellets ☒ 32
c. VOLCLAY Other ☐ ____

7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft³

8. Filter pack material: Manufacturer, product name and mesh size
a. SAND
b. Volume added 6.75 ft³

9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ☒ 24; Other ☐ ____

10. Screen material: Sch 80 PVC
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ____
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: ___ ft.

11. Backfill material (below filter pack): None ☐ 14; Other ☐ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: _____ Firm: CENTRAL WISCONSIN ENGINEERS

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ite of Wisconsin
partment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Vernon Co.

ility License, Permit or Monitoring Number: 03268__

Grid Location: 215.7 ft. [X] N. [ ] S.; 1656.6 ft. [X] E. [ ] W.

Well Name: MW-10

Wis. Unique Well Number: ____ DNR Well Number: ____

ype of Well: Water Table Observation Well [ ] 11; Piezometer [X] 12

Section Location: SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 [ ] E [X] W

Date Well Installed: 09/15/89 (m m d d y y)

tance Well Is From Waste/Source Boundary: 140' From Prop. Waste Limit ft.

Well Installed By: (Person's Name and Firm): Gus Pech; Exploration Technology Inc.

Is Well A Point of Enforcement Std. Application? [X] Yes [ ] No

Location of Well Relative to Waste/Source: [X] Upgradient [ ] Sidegradient [ ] Downgradient [ ] Not Known

A. Protective pipe, top elevation 1217.50 ft. MSL

B. Well casing, top elevation 1217.45 ft. MSL

C. Land surface elevation 1215.6 ft. MSL

D. Surface seal, bottom 1041.0 ft. MSL or 176.5 ft.

11. USCS classification of soil near screen:
[ ] GP [ ] GM [ ] GC [ ] GW [ ] SW [ ] SP
[ ] SM [ ] SC [ ] ML [ ] MH [ ] CL [ ] CH
[X] Bedrock

12. Sieve analysis attached? [ ] Yes [X] No

13. Drilling method used: Rotary [X] 50; Hollow Stem Auger [ ] 41; Other [ ] ____

14. Drilling fluid used: Water [ ] 02; Air [ ] 01; Drilling Mud [X] 03; None [ ] 99

15. Drilling additives used? [ ] Yes [X] No

Describe ____

17. Source of water (attach analysis):
City of Wiroqua Municipal Water

E. Bentonite seal, top N/A ft. MSL or N/A ft.

F. Fine sand, top 1041.0 ft. MSL or 176.5 ft.

G. Filter pack, top 1039.0 ft. MSL or 178.5 ft.

H. Well screen, top 1039.0 ft. MSL or 178.5 ft.

I. Well screen, bottom 1034.0 ft. MSL or 183.5 ft.

J. Filter pack, bottom 1034.0 ft. MSL or 183.5 ft.

K. Borehole, bottom 1033.5 ft. MSL or 184.5 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.40 in.

N. I.D. well casing 2.00 in.

1. Cap and lock? [X] Yes [ ] No

2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel [X] 04; Other [ ] ____
d. Additional protection? [ ] Yes [X] No
If yes, describe: ____

3. Surface seal: Bentonite [X] 30; Concrete [ ] 01; Other [ ] ____

4. Material between well casing and protective pipe: Bentonite [X] 30; Annular space seal [ ]; Other [ ] ____

5. Annular space seal: Granular Bentonite [X] 33
____ Lbs/gal mud weight ... Bentonite-sand slurry [ ] 35
____ Lbs/gal mud weight ..... Bentonite slurry [ ] 31
____ % Bentonite .... Bentonite-cement grout [ ] 50
29.5 Ft^3 volume added for any of the above
How installed: Tremie [ ] 01; Tremie pumped [ ] 02; Gravity [X] 08

6. Bentonite seal: Bentonite granules [ ] 33
[ ] 1/4 in. [ ] 3/8 in. [ ] 1/2 in. Bentonite pellets [ ] 32
No. 8 Bentonite Hole Plug Other [X]

7. Fine sand material: Manufacturer, product name and mesh size
Ottowa Sand
Volume added 0.4 ft^3

8. Filter pack material: Manufacturer, product name and mesh size
Waupaca Materials No. 30 Flint
Volume added 0.9 ft^3

9. Well casing: Flush threaded PVC schedule 40 [ ] 23; Flush threaded PVC schedule 80 [X] 24; Other [ ] ____

10. Screen material: Sch. 80 PVC
Screen type: Factory cut [X] 11; Continuous slot [ ] 01; Other [ ] ____
Manufacturer Northern Air & Supply
Slot size: 0.010 in.
Slotted length: 4.5 ft.

11. Backfill material (below filter pack): None [ ]
No. 30 Flint Sand Other [ ]

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Kirk Thornton Firm: Central Wisconsin Engineers

ease complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with . 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance d h. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation.

OTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Vernon Co.
Facility License, Permit or Monitoring Number: 03268__

Grid Location: 204.8 ft. [X] N. [ ] S.; 1652.4 ft. [X] E. [ ] W.

Well Name: MW-11
Wis. Unique Well Number: ____ DNR Well Number: ____

Type of Well: Water Table Observation Well [ ] 11; Piezometer [X] 12

Section Location: SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 [ ] E [X] W

Date Well Installed: 09 / 29 / 89 (m m / d d / y y)

Distance Well Is From Waste/Source Boundary: 150' From Prop. Waste Units ft.

Well A Point of Enforcement Std. Application? [X] Yes [ ] No

Location of Well Relative to Waste/Source: [X] Upgradient [ ] Sidegradient [ ] Downgradient [ ] Not Known

Well Installed By: (Person's Name and Firm)
Gus Pech
Exploration Technology, Inc.

A. Protective pipe, top elevation 1218.00 ft. MSL
B. Well casing, top elevation 1218.54 ft. MSL
C. Land surface elevation 1216.4 ft. MSL
D. Surface seal, bottom 1080.0 ft. MSL or 138.5 ft.

USCS classification of soil near screen:
[ ] GP [ ] GM [ ] GC [ ] GW [ ] SW [ ] SP
[ ] SM [ ] SC [ ] ML [ ] MH [ ] CL [ ] CH
[X] Bedrock

13. Sieve analysis attached? [ ] Yes [X] No

14. Drilling method used: Rotary [X] 50; Hollow Stem Auger [ ] 41; Other [ ] ____

15. Drilling fluid used: Water [ ] 02; Air [ ] 01; Drilling Mud [X] 03; None [ ] 99

16. Drilling additives used? [ ] Yes [X] No

Describe ____

17. Source of water (attach analysis): ____

E. Bentonite seal, top N/A ft. MSL or N/A ft.
F. Fine sand, top 1080.0 ft. MSL or 138.5 ft.
G. Filter pack, top 1077.0 ft. MSL or 141.5 ft.
H. Well screen, top 1071.0 ft. MSL or 147.5 ft.
I. Well screen, bottom 1056.0 ft. MSL or 162.5 ft.
J. Filter pack, bottom 1056.0 ft. MSL or 162.5 ft.
K. Borehole, bottom 1053.0 ft. MSL or 165.5 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 2.00 in.

1. Cap and lock? [X] Yes [ ] No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel [X] 04; Other [ ] ____
d. Additional protection? [ ] Yes [X] No
If yes, describe: ____
3. Surface seal: Bentonite [X] 30; Concrete [ ] 01; Other [ ] ____
4. Material between well casing and protective pipe: Bentonite [X] 30; Annular space seal [ ]; Other [ ] ____
5. Annular space seal: Granular Bentonite [X] 33
____ Lbs/gal mud weight ... Bentonite-sand slurry [ ] 35
____ Lbs/gal mud weight ..... Bentonite slurry [ ] 31
____ % Bentonite .... Bentonite-cement grout [ ] 50
23.0 Ft^3 volume added for any of the above
How installed: Tremie [X] 01; Tremie pumped [ ] 02; Gravity [X] 08
6. Bentonite seal: Bentonite granules [ ] 33
[ ] 1/4 in. [ ] 3/8 in. [ ] 1/2 in. Bentonite pellets [ ] 32
No. 8 Bentonite Hole Plug Other [X] ____
7. Fine sand material: Manufacturer, product name and mesh size
Ottowa Sand
Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name and mesh size
Waupaca Materials No. 30 Flint
Volume added 5.5 ft^3
9. Well casing: Flush threaded PVC schedule 40 [ ] 23; Flush threaded PVC schedule 80 [X] 24; Other [ ] ____
10. Screen material: Sch. 80 PVC
Screen type: Factory cut [X] 11; Continuous slot [ ] 01; Other [ ] ____
Manufacturer: Northern Air & Supply
Slot size: 0.010 in.
Slotted length: 13.5 ft.
11. Backfill material (below filter pack): None [ ]
No. 30 Flint Sand Other [ ]

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature: Kirk Thornton
Firm: Central Wisconsin Engineers

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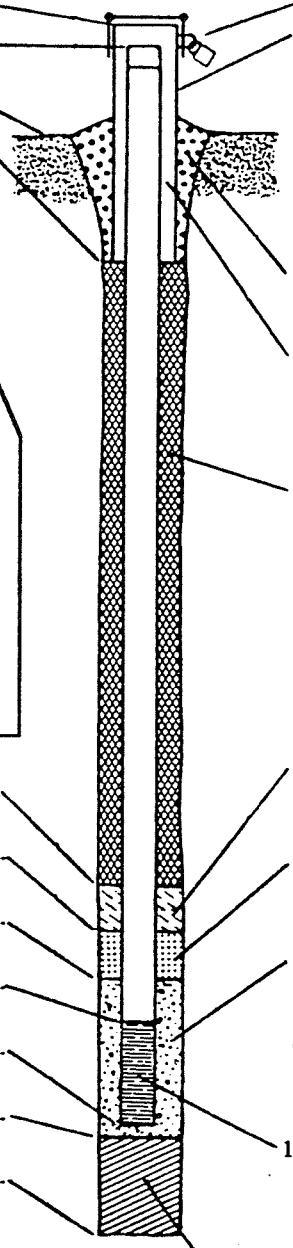
State of Wisconsin
partment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

acility/Project Name: Vernon Co.	Grid Location: 200.0 ft. [X] N. [ ] S.; 1647.2 ft. [X] E. [ ] W.	Well Name: MW-12
ility License, Permit or Monitoring Number: 03268		Wis. Unique Well Number: ____ DNR Well Number: ____
Type of Well: Water Table Observation Well [X] 11; Piezometer [ ] 12	Section Location: SE 1/4 of SW 1/4 of Section 15, T 13 N, R 4 [ ] E [X] W	Date Well Installed: 09 / 22 / 89 (m m / d d / y y)
tance Well Is From Waste/Source Boundary: 155' From Prop. Waste Limits ft.	Location of Well Relative to Waste/Source: [X] Upgradient [ ] Sidegradient; [ ] Downgradient [ ] Not Known	Well Installed By: (Person's Name and Firm): Gus Pech; Exploration Technology, Inc.
s Well A Point of Enforcement Std. Application? [X] Yes [ ] No		

A. Protective pipe, top elevation 1218.10 ft. MSL
B. Well casing, top elevation 1218.36 ft. MSL
C. Land surface elevation 1216.4 ft. MSL
D. Surface seal, bottom 1142.9 ft. MSL or 75.5 ft.
E. USCS classification of soil near screen:
[ ] GP [ ] GM [ ] GC [ ] GW [ ] SW [ ] SP
[ ] SM [ ] SC [ ] ML [ ] MH [ ] CL [ ] CH
[X] Bedrock
F. Sieve analysis attached? [ ] Yes [X] No
G. Drilling method used: Rotary [X] 50; Hollow Stem Auger [ ] 41; Other [ ]
H. Drilling fluid used: Water [ ] 02; Air [ ] 01; Drilling Mud [X] 03; None [ ] 99
I. Drilling additives used? [ ] Yes [X] No
Describe
J. Source of water (attach analysis):
City of Viroqua Numicipal Water

K. Bentonite seal, top 1142.9 ft. MSL or 75.5 ft.
L. Fine sand, top 1140.9 ft. MSL or 77.5 ft.
M. Filter pack, top 1138.9 ft. MSL or 79.5 ft.
N. Well screen, top 1134.9 ft. MSL or 83.5 ft.
O. Well screen, bottom 1119.9 ft. MSL or 98.5 ft.
P. Filter pack, bottom 1119.9 ft. MSL or 98.5 ft.
Q. Borehole, bottom 1112.9 ft. MSL or 105.5 ft.
R. Borehole, diameter 6.0 in.
S. O.D. well casing 2.40 in.
T. I.D. well casing 2.00 in.



1. Cap and lock? [X] Yes [ ] No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel [X] 04; Other [ ]
d. Additional protection? [ ] Yes [X] No
If yes, describe:
3. Surface seal: Bentonite [X] 30; Concrete [ ] 01; Other [ ]
4. Material between well casing and protective pipe: Bentonite [X] 30; Annular space seal [ ]; Other [ ]
5. Annular space seal: Granular Bentonite [X] 33
____ Lbs/gal mud weight . . . Bentonite-sand slurry [ ] 35
____ Lbs/gal mud weight . . . . . Bentonite slurry [ ] 31
____ % Bentonite . . . . . Bentonite-cement grout [ ] 50
12.5 Ft^3 volume added for any of the above
How installed: Tremie [ ] 01; Tremie pumped [ ] 02; Gravity [X] 08
6. Bentonite seal: Bentonite granules [ ] 33
[ ] 1/4 in. [ ] 3/8 in. [ ] 1/2 in. Bentonite pellets [ ] 32
No. 8 Bentonite Hole Plug Other [X]
7. Fine sand material: Manufacturer, product name and mesh size
Ottowa Sand
Volume added 0.4 ft^3
8. Filter pack material: Manufacturer, product name and mesh size
Waupaca Materials. No. 30 Flint
Volume added 3.2 ft^3
9. Well casing: Flush threaded PVC schedule 40 [ ] 23; Flush threaded PVC schedule 80 [X] 24; Other [ ]
10. Screen material: Sch. 80 PVC
Screen type: Factory cut [X] 11; Continuous slot [ ] 01; Other [ ]
Manufacturer Northern Air & Supply
Slot size: 0.010 in.
Slotted length: 13.5 ft.
11. Backfill material (below filter pack): None [ ]
No. 30 Flint Sand Other [ ]

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature: Kirk Thorton Firm: Central Wisconsin Engineers

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation.
NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
epartment of Natural Resources

Route To: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4.90

Facility/Project Name *Vernon Co. Balefill*	**Local Grid Location of Well** *1275.90 Feet N, 1678.68 Feet E*	**Well Name** *MW-14*
Facility License, Permit or Monitoring Number *03268*	**Grid Origin Location**	**Wis. Unique Well Number** *JX072* **DNR Well Number** *118*
Type of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	**Section Location of Waste/Source** *SW 1/4, SE 1/4, Sec. 15, T13N, R4E*	**Date Well Installed** *03/12/2003*
Distance Well is From Waste/Source Boundary *100 ft.*	**Location of Well Relative to Waste/Source** u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	**Well Installed By: (Person's Name and Firm)** *Daryl Karasch* *Traut Hydro Tech*
s Well A Point of Enforcement Std. Application? ☐ Yes ☒ No		

A. Protective pipe, top elevation 1250.0 ft. MSL
B. Well casing, top elevation 1249.69 ft. MSL
C. Land surface elevation 1247.5 ft. MSL
D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS Classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

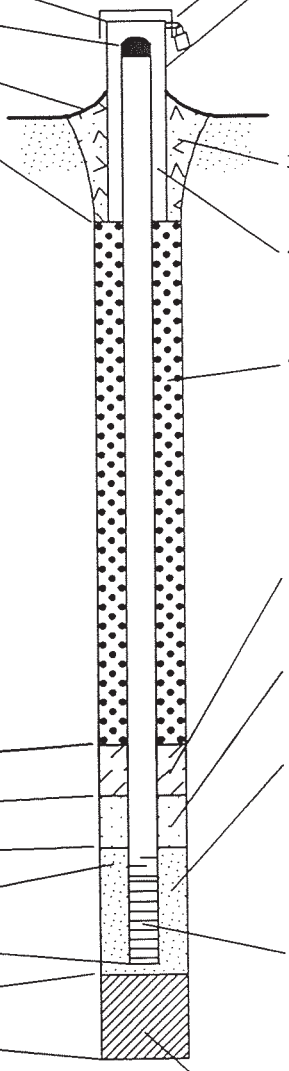
14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☐ 41
x _____ Other ☒ Versa Sonic

15. Drilling fluid used: Water ☒ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water *(attach analysis)*:
City of Viroqua Airport

E. Bentonite seal, top _____ ft. MSL or 161 ft.
F. Fine sand, top _____ ft. MSL or 166 ft.
G. Filter pack, top _____ ft. MSL or 168 ft.
H. Screen joint, top _____ ft. MSL or 170 ft.
I. Well bottom _____ ft. MSL or 185 ft.
J. Filter pack, bottom _____ ft. MSL or 185 ft.
K. Borehole, bottom _____ ft. MSL or 190 ft.
L. Borehole, diameter 7.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.94 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 7 ft.
c. Material: _____ Steel ☐ 04 Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☒ 30 Concrete ☐ 01
_____ Other ☐
4. Material between well casing and protective pipe:
Bentonite ☒ 30 Annular space seal ☐
_____ Other ☐
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight ..... Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight ..... Bentonite slurry ☒ 31
d. _____ % Bentonite ..... Bentonite-cement grout ☐ 50
e. _____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☒ 02
Gravity ☐ 08
6. Bentonite seal: a. Bentonite Granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
c. _____ Other ☐
7. Fine sand material: Manufacturer, product name and mesh size
a. Unimin #70
b. Volume added 0.66 ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. Red Flint #40
b. Volume added 5.9 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23
Flush threaded PVC schedule 80 ☒ 24
_____ Other ☐
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
_____ Other ☐
b. Manufacturer Johnson
c. Slot size: 0.010 in.
d. Slotted length: 15 ft.
11. Backfill material (below filter pack): None ☐ 14
Sand #30 Other ☒

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Retted Trautfein Firm Central Wisconisn Engineers & Architects

Please complete both sides of this form and return to the appropriate DNR office listted at the top of this form as required by chs. 144, 147 and 160 Wis. tats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144 Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more ian $5000 for each day of violation. In accordance with ch. 147 Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for ach day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route To: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 4.90

Facility/Project Name *Vernon Co. Balefill*	**Local Grid Location of Well** *1261.80 Feet N, 1691.28 Feet E*	**Well Name** *MW-14Z*
Facility License, Permit or Monitoring Number *03268*	**Grid Origin Location**	**Wis. Unique Well Number** *JX073* **DNR Well Number** *119*
Type of Well Water Table Observation Well ☐ 11 Piezometer ☒ 12	**Section Location of Waste/Source** *SW 1/4, SE 1/4, Sec. 15, T13N, R4E*	**Date Well Installed** *03/07/2003*
Distance Well is From Waste/Source Boundary *115 ft.*	**Location of Well Relative to Waste/Source** u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	**Well Installed By: (Person's Name and Firm)** *Daryl Karasch* *Traut Hydro Tech*
Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No		

A. Protective pipe, top elevation 1250.5 ft. MSL
B. Well casing, top elevation 1250.22 ft. MSL
C. Land surface elevation 1247.5 ft. MSL
D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS Classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

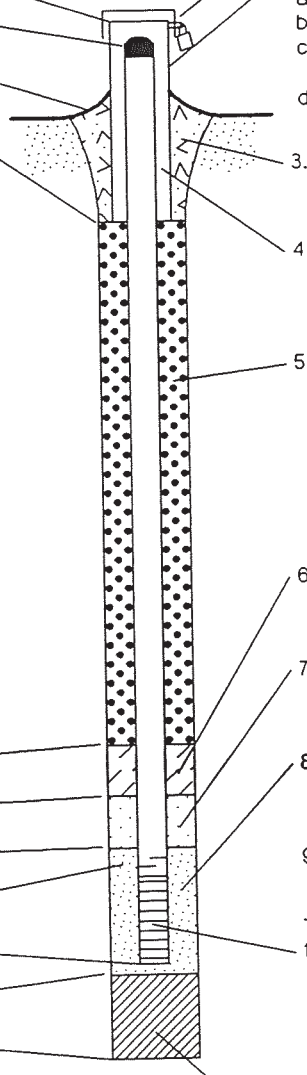
14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☐ 41
x _____ Other ☒ Versa Sonic

15. Drilling fluid used: Water ☒ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water *(attach analysis)*:
Viroqua

E. Bentonite seal, top _____ ft. MSL or 194.5 ft.
F. Fine sand, top _____ ft. MSL or 199.5 ft.
G. Filter pack, top _____ ft. MSL or 201.5 ft.
H. Screen joint, top _____ ft. MSL or 203.5 ft.
I. Well bottom _____ ft. MSL or 208.5 ft.
J. Filter pack, bottom _____ ft. MSL or 210 ft.
K. Borehole, bottom _____ ft. MSL or 210 ft.
L. Borehole, diameter 7.0 in.
M. O.D. well casing 2.40 in.
N. I.D. well casing 1.94 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 7 ft.
c. Material: Steel ☐ 04
Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☒ 30
Concrete ☐ 01
_____ Other ☐
4. Material between well casing and protective pipe:
Bentonite ☒ 30
Annular space seal ☐
_____ Other ☐
5. Annular space seal: a. Granular Bentonite ☐ 33
b. ____ Lbs/gal mud weight ..... Bentonite-sand slurry ☒ 35
c. ____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
d. ____ % Bentonite ..... Bentonite-cement grout ☐ 50
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☒ 02
Gravity ☐ 08
6. Bentonite seal: a. Bentonite Granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
c. _____ Other ☐
7. Fine sand material: Manufacturer, product name and mesh size
a. Unimin #70
b. Volume added 0.66 ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. Red Flint #40
b. Volume added 2.2 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23
Flush threaded PVC schedule 80 ☒ 24
_____ Other ☐
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
_____ Other ☐
b. Manufacturer Johnson
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☒ 14
_____ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm Central Wisconisn Engineers & Architects

Please complete both sides of this form and return to the appropriate DNR office listted at the top of this form as required by chs. 144, 147 and 160 Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144 Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147 Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other ☐

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Vernon County Solid Waste Facility	Local Grid Location of Well: 164748 ft. ☒ N. ☐ S. 715687 ft. ☒ E. ☐ W.	Well Name: MW-14WT
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: WC334 / DNR Well ID No.
Facility ID	St. Plane ft. N, ft. E. S/C/N	Date Well Installed: 09/20/2022 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: 1/4 of 1/4 of Sec. , T. N, R. ☐ E. ☐ W.	Well Installed By: Name (first, last) and Firm: Ethan Rislov / Braun Intertec
Distance from Waste/Source ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number

A. Protective pipe, top elevation 1249.7 ft. MSL

B. Well casing, top elevation 1249.7 ft. MSL

C. Land surface elevation 1247.15 ft. MSL

D. Surface seal, bottom 1245 ft. MSL or 2 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐

15. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☒ 03 / None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe

17. Source of water (attach analysis, if required):
City of Viroqua Municipal

E. Bentonite seal, top ft. MSL or 85 ft.

F. Fine sand, top ft. MSL or 86 ft.

G. Filter pack, top ft. MSL or 88 ft.

H. Screen joint, top ft. MSL or 91 ft.

I. Well bottom ft. MSL or 106 ft.

J. Filter pack, bottom ft. MSL or 109 ft.

K. Borehole, bottom ft. MSL or 109 ft.

L. Borehole, diameter 0006 in.

M. O.D. well casing 2.375 in.

N. I.D. well casing 1.939 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 006 in.
b. Length: 005 ft.
c. Material: Steel ☒ 04 / Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bumper Posts

3. Surface seal: Bentonite ☐ 30 / Concrete ☒ 01 / Other ☐
NA

4. Material between well casing and protective pipe: Bentonite ☒ 30 / Other ☐
NA

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 20 % Bentonite . . . . . Bentonite-cement grout ☒ 50
e. Ft³ volume added for any of the above
f. How installed: Tremie ☒ 01 / Tremie pumped ☐ 02 / Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☒3/8 in. ☐1/2 in. Bentonite chips ☒ 32
c. NA Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. #15 sand
b. Volume added 1 ft³

8. Filter pack material: Manufacturer, product name & mesh size
a. #40 sand
b. Volume added 4 ft³

9. Well casing: Flush threaded PVC schedule 40 ☐ 23 / Flush threaded PVC schedule 80 ☒ 24 / Other ☐

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐
NA
b. Manufacturer NA
c. Slot size: 0.010 in.
d. Slotted length: 0015 ft.

11. Backfill material (below filter pack): None ☒ 14 / Other ☐
NA

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Firm Braun Intertec

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Vernon County Solid Waste Facility	Local Grid Location of Well: 164382 ft. ☒ N. ☐ S. 715726 ft. ☒ E. ☐ W.	Well Name: MW-15WT
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: WC335 DNR Well ID No.:
Facility ID	St. Plane ft. N, ft. E. S/C/N	Date Well Installed: 09/20/2022 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: 1/4 of 1/4 of Sec, T. N, R. ☐ E ☐ W	Well Installed By: Name (first, last) and Firm: Ethan Rislov; Braun Intertec
Distance from Waste/Source ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number

A. Protective pipe, top elevation 1223.38 ft. MSL

B. Well casing, top elevation 1223.24 ft. MSL

C. Land surface elevation 1220.61 ft. MSL

D. Surface seal, bottom 1218 ft. MSL or 2 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ ____

15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☒ 03; None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required):
City of Viroqua Municipal

E. Bentonite seal, top ____ ft. MSL or 68 ft.

F. Fine sand, top ____ ft. MSL or 69 ft.

G. Filter pack, top ____ ft. MSL or 70 ft.

H. Screen joint, top ____ ft. MSL or 75 ft.

I. Well bottom ____ ft. MSL or 85 ft.

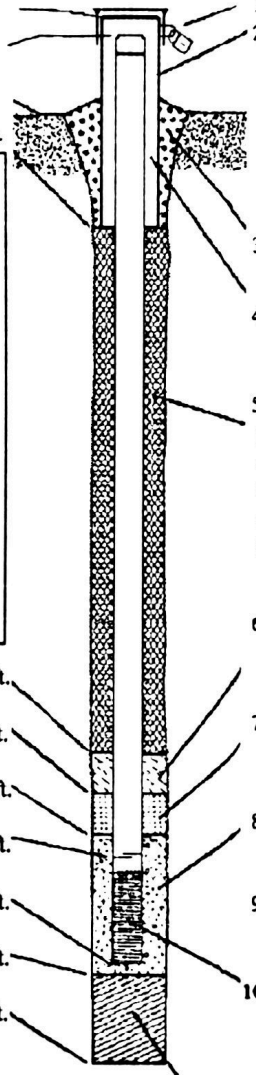
J. Filter pack, bottom ____ ft. MSL or 98 ft.

K. Borehole, bottom ____ ft. MSL or 99 ft.

L. Borehole, diameter 0006 in.

M. O.D. well casing 2.375 in.

N. I.D. well casing 2.047 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 006 in.
b. Length: 005 ft.
c. Material: Steel ☒ 04; Other ☐ ____
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bumper Posts

3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ ____
NA

4. Material between well casing and protective pipe: Bentonite ☒ 30; Other ☐ ____
NA

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 20 % Bentonite . . . . . Bentonite-cement grout ☒ 50
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☒ 01; Tremie pumped ☐ 02; Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32
c. NA Other ☐ ____

7. Fine sand material: Manufacturer, product name & mesh size
a. #15 sand
b. Volume added 1 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. #40 sand
b. Volume added 4.5 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ ____

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ____
NA
b. Manufacturer NA
c. Slot size: 0.010 in.
d. Slotted length: 0010 ft.

11. Backfill material (below filter pack): None ☒ 14; Other ☐ ____
NA

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: _____ Firm: Braun Intertec

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name Vernon County Solid Waste Facility	**Local Grid Location of Well** 163940 ft. ☒ N. ☐ S. 715674 ft. ☒ E. ☐ W.	**Well Name** MW-16WT
Facility License, Permit or Monitoring No.	**Local Grid Origin** ☐ (estimated: ☐) or **Well Location** ☐ Lat. ° ' " Long. ° ' " or	**Wis. Unique Well No.** WC336
Facility ID	**St. Plane** _____ ft. N, _____ ft. E. S/C/N	**DNR Well ID No.**
Type of Well Well Code 12 / PZ	**Section Location of Waste/Source** 1/4 of 1/4 of Sec. , T. N, R. ☐ E. ☐ W	**Date Well Installed** 09/20/2022 (m m d d y y y y)
Distance from Waste/ Source _____ ft.	**Enf. Stds. Apply** ☐	**Location of Well Relative to Waste/Source** u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known
	Gov. Lot Number	**Well Installed By: Name (first, last) and Firm** Ethan Rislov Braun Intertec

A. Protective pipe, top elevation 1187.51 ft. MSL

B. Well casing, top elevation 1187.41 ft. MSL

C. Land surface elevation 1184.70 ft. MSL

D. Surface seal, bottom 1182 ft. MSL or 2 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50
Hollow Stem Auger ☒ 41
Other ☐

15. Drilling fluid used: Water ☒ 02 Air ☐ 01
Drilling Mud ☒ 03 None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis, if required):
City of Viroqua Municipal

E. Bentonite seal, top _____ ft. MSL or 58 ft.

F. Fine sand, top _____ ft. MSL or 59.5 ft.

G. Filter pack, top _____ ft. MSL or 64.5 ft.

H. Screen joint, top _____ ft. MSL or 65 ft.

I. Well bottom _____ ft. MSL or 75 ft.

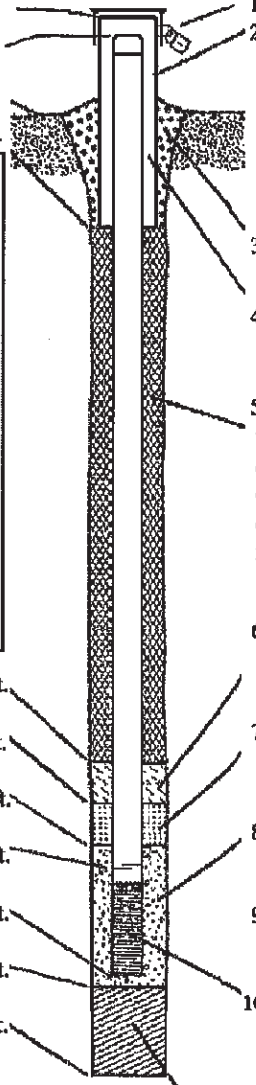
J. Filter pack, bottom _____ ft. MSL or 75 ft.

K. Borehole, bottom _____ ft. MSL or 76 ft.

L. Borehole, diameter 0006 in.

M. O.D. well casing 2.375 in.

N. I.D. well casing 2.047 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 006 in.
b. Length: 005 ft.
c. Material: Steel ☒ 04
Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bumper Posts

3. Surface seal: Bentonite ☐ 30
Concrete ☒ 01
NA Other ☐

4. Material between well casing and protective pipe:
Bentonite ☒ 30
NA Other ☐

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 20 % Bentonite . . . . . Bentonite-cement grout ☒ 50
e. _____ Ft^3 volume added for any of the above
f. How installed: Tremie ☒ 01
Tremie pumped ☐ 02
Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☒3/8 in. ☐1/2 in. Bentonite chips ☒ 32
c. NA Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. #15 sand
b. Volume added 1 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. #40 sand
b. Volume added 2 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23
Flush threaded PVC schedule 80 ☐ 24
Other ☐

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
NA Other ☐
b. Manufacturer NA
c. Slot size: 0.010 in.
d. Slotted length: 0005 ft.

11. Backfill material (below filter pack): None ☒ 14
NA Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm Braun Intertec

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name Vernon County Solid Waste Facility	**Local Grid Location of Well** 163930 ft. ☒ N. ☐ S. 715670 ft. ☒ E. ☐ W.	**Well Name** MW-16
Facility License, Permit or Monitoring No.	**Local Grid Origin** ☐ (estimated: ☐) or **Well Location** ☐ Lat. ° ' " Long. ° ' " or	**Wis. Unique Well No.** WC337 **DNR Well ID No.**
Facility ID	St. Plane _____ ft. N, _____ ft. E. S/C/N	**Date Well Installed** 09/20/2022 (m m / d d / y y y y)
Type of Well Well Code 12 / PZ	**Section Location of Waste/Source** _____ 1/4 of _____ 1/4 of Sec, _____ T. _____ N, R. _____ ☐ E ☐ W	**Well Installed By: Name (first, last) and Firm** Ethan Rislov Braun Intertec
Distance from Waste/ Source _____ ft. **Enf. Stds. Apply** ☐	**Location of Well Relative to Waste/Source** u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	**Gov. Lot Number**

A. Protective pipe, top elevation 1186.95 ft. MSL

B. Well casing, top elevation 1186.92 ft. MSL

C. Land surface elevation 1184.27 ft. MSL

D. Surface seal, bottom 1182 ft. MSL or 2 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50
Hollow Stem Auger ☒ 41
Other ☐

15. Drilling fluid used: Water ☒ 02 Air ☐ 01
Drilling Mud ☒ 03 None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis, if required):
City of Viroqua Municipal

E. Bentonite seal, top _____ ft. MSL or 78 ft.

F. Fine sand, top _____ ft. MSL or 86.5 ft.

G. Filter pack, top _____ ft. MSL or 89 ft.

H. Screen joint, top _____ ft. MSL or 92 ft.

I. Well bottom _____ ft. MSL or 97 ft.

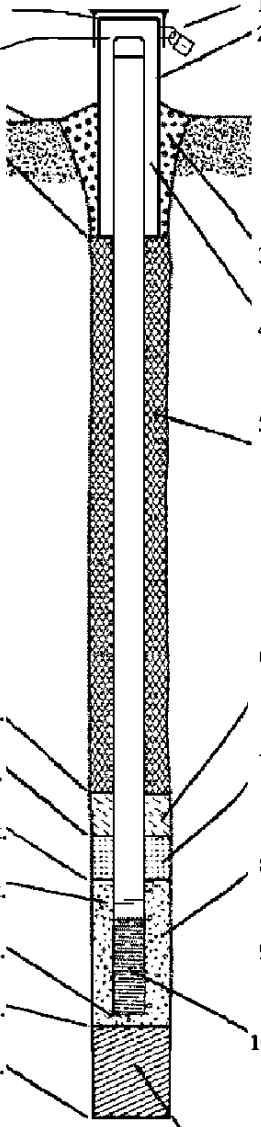
J. Filter pack, bottom _____ ft. MSL or 98 ft.

K. Borehole, bottom _____ ft. MSL or 98 ft.

L. Borehole, diameter 0006 in.

M. O.D. well casing 2.375 in.

N. I.D. well casing 2.047 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 006 in.
b. Length: 005 ft.
c. Material: Steel ☒ 04
Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bumper Posts

3. Surface seal: Bentonite ☐ 30
Concrete ☒ 01
NA Other ☐

4. Material between well casing and protective pipe:
Bentonite ☒ 30
NA Other ☐

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 20 % Bentonite . . . . . Bentonite-cement grout ☒ 50
e. _____ Ft^3 volume added for any of the above
f. How installed: Tremie ☒ 01
Tremie pumped ☐ 02
Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☒3/8 in. ☐1/2 in. Bentonite chips ☒ 32
c. NA Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. #15 sand
b. Volume added 1 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. #40 sand
b. Volume added 2 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23
Flush threaded PVC schedule 80 ☐ 24
Other ☐

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
NA Other ☐
b. Manufacturer NA
c. Slot size: 0.010 in.
d. Slotted length: 0005 ft.

11. Backfill material (below filter pack): None ☒ 14
NA Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Alex Boecher May 21 2023 9:16 PM	Firm
		Braun Intertec

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Vernon County Solid Waste Facility

Local Grid Location of Well: 163091 ft. ☒ N ☐ S, 715688 ft. ☒ E. ☐ W.

Well Name: MW-17WT

Facility License, Permit or Monitoring No.

Local Grid Origin ☐ (estimated: ☐) or Well Location ☐
Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or

Wis. Unique Well No.: WC338

DNR Well ID No.:

Facility ID

St. Plane _____ ft. N, _____ ft. E. S/C/N

Date Well Installed: 09/20/2022 (m m d d y y y y)

Type of Well
Well Code 11 / MW

Section Location of Waste/Source
_____ 1/4 of _____ 1/4 of Sec. _____, T. _____ N, R. _____ ☐ E ☐ W

Well Installed By: Name (first, last) and Firm
Ethan Rislov
Braun Intertec

Distance from Waste/Source _____ ft.

Enf. Stds. Apply ☐

Location of Well Relative to Waste/Source
u ☐ Upgradient s ☐ Sidegradient
d ☐ Downgradient n ☐ Not Known

Gov. Lot Number

A. Protective pipe, top elevation 1199.24 ft. MSL

B. Well casing, top elevation 1199.18 ft. MSL

C. Land surface elevation 1196.43 ft. MSL

D. Surface seal, bottom 1194 ft. MSL or 2 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50
Hollow Stem Auger ☒ 41
Other ☐ ___
_____

15. Drilling fluid used: Water ☒ 02 Air ☐ 01
Drilling Mud ☒ 03 None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis, if required):
City of Viroqua Municipal

E. Bentonite seal, top _____ ft. MSL or 68 ft.

F. Fine sand, top _____ ft. MSL or 71 ft.

G. Filter pack, top _____ ft. MSL or 75 ft.

H. Screen joint, top _____ ft. MSL or 77 ft.

I. Well bottom _____ ft. MSL or 87 ft.

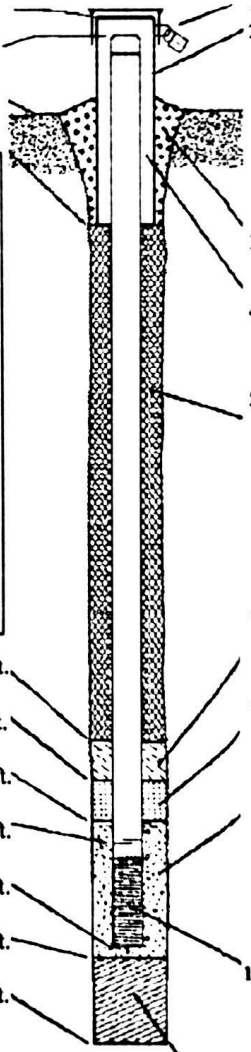
J. Filter pack, bottom _____ ft. MSL or 92 ft.

K. Borehole, bottom _____ ft. MSL or 93 ft.

L. Borehole, diameter 0006 in.

M. O.D. well casing 2.375 in.

N. I.D. well casing 2.047 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 006 in.
b. Length: 005 ft.
c. Material: Steel ☒ 04
Other ☐ ___
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bumper Posts

3. Surface seal: Bentonite ☐ 30
Concrete ☒ 01
NA Other ☐ ___

4. Material between well casing and protective pipe:
Bentonite ☒ 30
NA Other ☐ ___

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. 20 % Bentonite . . . . . Bentonite-cement grout ☒ 50
e. ___ Ft³ volume added for any of the above
f. How installed: Tremie ☒ 01
Tremie pumped ☐ 02
Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☒3/8 in. ☐1/2 in. Bentonite chips ☒ 32
c. NA Other ☐ ___

7. Fine sand material: Manufacturer, product name & mesh size
a. #15 sand
b. Volume added 1 ft³

8. Filter pack material: Manufacturer, product name & mesh size
a. #40 sand
b. Volume added 4 ft³

9. Well casing: Flush threaded PVC schedule 40 ☒ 23
Flush threaded PVC schedule 80 ☐ 24
_____ Other ☐ ___

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
NA Other ☐ ___
b. Manufacturer NA
c. Slot size: 0.010 in.
d. Slotted length: 0010 ft.

11. Backfill material (below filter pack): None ☒ 14
NA Other ☐ ___

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm Braun Intertec

Please complete both Form 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

Appendix O

Well Development Forms within 300 feet of Proposed Expansion

Central Wisconsin
Engineers

P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

MONITORING WELL DEVELOPMENT

Project Vernon Co. Landfill

Date 3-27-88

Well MW # 3

Method of Development Hand Bailer

Time Before 12:00

Depth to Water 169.42

Clarity of Water Before very silty

Presence of Sediment Before yes

Volume of Water Removed 3.5 gallons

Depth to Water After 170.00

Clarity of Water After slightly silty

Presence of Sediment After some

Time Finished 12:15

-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --

Field Temperature 10 °C at 8:30 (Time)

Field Conductivity 280 microhms at 9:30 (Time)

Field pH 6.92 at 9:30 (Time)

Total Suspended Solids:

Central Wisconsin
Engineers

P.O. BOX F • SCHOFIELD, WI 54476 • (715) 359-9400

MONITORING WELL DEVELOPMENT

Project Vernon Co. Landfill

Date 3-24-88

Well MW # 4P

Method of Development Hand Bailer

Time Before 10:20

Depth to Water 88.92

Clarity of Water Before very silty

Presence of Sediment Before yes

Volume of Water Removed 6.3 gallons

Depth to Water After 90.25

Clarity of Water After slightly silty

Presence of Sediment After yes

Time Finished 10:35

-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -

Field Temperature 10 °C at 8:30 (Time)

Field Conductivity 280 microhms at 10:00 (Time)

Field pH 6.92 at 10:00 (Time)

Total Suspended Solids:

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

Facility/Project Name: Vernon County

Well Name: MW-5A

License, Permit or Monitoring Number: 03268

Wis. Unique Well Number: _____ DNR Well Number: _____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☒	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☐	51
pumped slowly	☐	50
Other _____	☐	___

3. Time spent developing well: 120 min.

4. Depth of well (from top of well casisng): 103.3 ft.

5. Inside diameter of well: 2.00 in.

6. Volume of water in filter pack and well casing: 2.6 gal.

7. Volume of water removed from well: 25.5 gal.

8. Volume of water added (if any): 0.0 gal.

9. Source of water added: N/A

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☒ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	91.12 ft.	91.27 ft.
Date	12/27/89 (m m d d y y)	12/27/89 (m m d d y y)
Time	1:40 ☐ a.m. ☒ p.m.	: ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) Light Brown	Clear ☐ 20 Turbid ☒ 25 (Describe) Light Brown

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

Additional comments on development:

#14 & 15 data not available

Well developed by: Person's Name and Firm

Name: Arik Salzman

Firm: Central Wisconsin Engineers, Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: Arik Salzman

Firm: Central Wisconsin Engineers, Inc.

NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B 8-89

Facility/Project Name: Vernon Co.

Well Name: MW-10

License, Permit or Monitoring Number: 03268__

Wis. Unique Well Number: _____ DNR Well Number: ____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☒	10
pumped only	☐	51
pumped slowly	☐	50
Other _____	☐	____

3. Time spent developing well ___90_ min.

4. Depth of well (from top of well casisng) __181.0_ ft.

5. Inside diameter of well __2.00_ in.

6. Volume of water in filter pack and well casing ___5.5 gal.

7. Volume of water removed from well ___40.0 gal.

8. Volume of water added (if any) ___0.0 gal.

9. Source of water added N/A

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☒ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	__146.43_ ft.	__147.26_ ft.
Date	10 / 24 / 89 (m m d d y y)	10 / 24 / 89 (m m d d y y)
Time	__3:30_ ☐ a.m. ☒ p.m.	__5:00_ ☐ a.m. ☒ p.m.
12. Sediment in well bottom	__0.0_ inches	__0.0_ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) Light Brown	Clear ☐ 20 Turbid ☒ 25 (Describe) Light Brown

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	_____.__ mg/l	_____.__ mg/l
15. COD	_____.__ mg/l	_____.__ mg/l

Additional comments on development:

#14 & 15 data not available

Well developed by: Person's Name and Firm

Name: Steve Braun

Firm: Central Wisconsin Engineers

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [signature]

Firm: Central Wisconsin Engineers

NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B 8-89

Facility/Project Name: Vernon Co.

Well Name: MW-11

License, Permit or Monitoring Number: 03268__

Wis. Unique Well Number: _____ DNR Well Number: ___

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☒	10
pumped only	☐	51
pumped slowly	☐	50
Other _____	☐	___

3. Time spent developing well ___25 min.

4. Depth of well (from top of well casisng) __160.0 ft.

5. Inside diameter of well __2.00 in.

6. Volume of water in filter pack and well casing ___3.2 gal.

7. Volume of water removed from well ___3.0 gal.

8. Volume of water added (if any) ___0.0 gal.

9. Source of water added N/A

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	__144.62__ ft.	__Dry__.___ ft.
Date	10/24/89 (m m d d y y)	10/24/89 (m m d d y y)
Time	__3:00__ ☐ a.m. ☒ p.m.	__3:25__ ☐ a.m. ☒ p.m.
12. Sediment in well bottom	__0.0 inches	__0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) Light Brown	Clear ☐ 20 Turbid ☒ 25 (Describe) Light Brown

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	_____.__ mg/l	_____.__ mg/l
15. COD	_____.__ mg/l	_____.__ mg/l

Additional comments on development:

#14-15 data not available

Well developed by: Person's Name and Firm

Name: Steve Braun

Firm: Central Wisconsin Engineers

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [signature]

Firm: Central Wisconsin Engineers

NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

Facility/Project Name: Vernon Co.
License, Permit or Monitoring Number: 03268__
Well Name: MW-12
Wis. Unique Well Number: _____ DNR Well Number: ___

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☒	10
pumped only	☐	51
pumped slowly	☐	50
Other _____	☐	___

3. Time spent developing well: 155 min.
4. Depth of well (from top of well casisng): 96.0 ft.
5. Inside diameter of well: 2.00 in.
6. Volume of water in filter pack and well casing: 1.2 gal.
7. Volume of water removed from well: 16.0 gal.
8. Volume of water added (if any): 0.0 gal.
9. Source of water added: N/A
10. Analysis performed on water added? (If yes, attach results) ☒ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	90.33 ft.	Dry ft.
Date	10 / 24 / 89 (m m d d y y)	10 / 24 / 89 (m m d d y y)
Time	10 : 55 ☒ a.m. ☐ p.m.	1 : 30 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) Light Brown	Clear ☐ 20 Turbid ☒ 25 (Describe) Light Brown

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

Additional comments on development:
14 & 15 data not available

Well developed by: Person's Name and Firm
Name: Steve Braun
Firm: Central Wisconsin Engineers

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: [signature]
Firm: Central Wisconsin Engineers

NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

Route To: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL DEVELOPMENT
Form 4400-113B Rev. 4-90

Facility/Project Name	County Name	Well Name	
Vernon Co. Balefill	Vernon	MW-14	
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number**	**DNR Well Number**
03268	63	JX072	118

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☒ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 75 min.

4. Depth of well (from top of well casing) 186.1 ft.

5. Inside diameter of well 1.94 in.

6. Volume of water in filter pack and well casing 3.2 gal.

7. Volume of water removed from well 8.0 gal.

8. Volume of water added (if any) 0 gal.

9. Source of water added City of Viroqua Airport

10. Analysis performed on water added? ☐ Yes ☒ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 181.39 ft.	182.82 ft.
Date mm/dd/yy	b. 03/25/2003	03/25/2003
Time	c. 01:45 ☐ a.m. ☒ p.m.	3:00 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	inches	inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) Brown silty Sandy	Clear ☐ 10 Turbid ☐ 15 (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	mg/l	mg/l
15. COD	mg/l	mg/l

16. Additional comments on development:

Well developed by: Person's Name and Firm

Name: Ka Yin Yang

Firm: Central Wisconisn Engineers & Architects

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [signature]

Print Initials: KYY

Firm: Central Wisconisn Engineers & Architects

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

State of Wisconsin
Department of Natural Resources

Route To: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL DEVELOPMENT
Form 4400-113B Rev. 4-90

Facility/Project Name	County Name	Well Name	
Vernon Co. Balefill	Vernon	MW-14Z	
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number**	**DNR Well Number**
03268	63	JX073	119

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☒ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 195 min.

4. Depth of well (from top of well casing) 210.8 ft.

5. Inside diameter of well 1.94 in.

6. Volume of water in filter pack and well casing 9.8 gal.

7. Volume of water removed from well 25.0 gal.

8. Volume of water added (if any) 0 gal.

9. Source of water added Viroqua

10. Analysis performed on water added? ☐ Yes ☒ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 182.92 ft.	183.15 ft.
Date mm/dd/yy	b. 03/25/2003	05/07/2003
Time	c. 01:30 ☐ a.m. ☒ p.m.	2:00 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	inches	inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) Slightly silty Light tan	Clear ☐ 10 Turbid ☒ 15 (Describe) Slightly cloudy Light tan

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	mg/l	mg/l
15. COD	mg/l	mg/l

16. Additional comments on development:

Well developed by: Person's Name and Firm

Name: Ka Yin Yang

Firm: Central Wisconisn Engineers & Architects

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [signature]

Print Initials: KYY

Firm: Central Wisconisn Engineers & Architects

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Vernon County Landfill	Vernon	MW-14WT

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
3268	62	WC334	125

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☒ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 108.35 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 0.80 gal.

7. Volume of water removed from well 80.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing) a.	103.31 ft.	103.31 ft.
Date b.	11 / 02 / 2022 (m m / d d / y y y y)	11 / 02 / 2022 (m m / d d / y y y y)
Time c.	1 : 00 ☐ a.m. ☒ p.m.	2 : 00 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.1 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) very light brown turbid	Clear ☒ 20 Turbid ☐ 25 (Describe) clear
14. Total suspended solids	____ mg/l	289.0 mg/l
15. COD	____ mg/l	10.0 mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Veronica Last Name: Aranda
Firm: Short Elliott Hendrickson Inc.

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Stacie Last Name: Sanborn
Facility/Firm: Vernon County Solid Waste
Street: S3705 County Road LF
City/State/Zip: Viroqua, WI 54665

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Veronica Aranda
Print Name: Veronica Aranda
Firm: Short Elliott Hendrickson Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Vernon County Landfill	Vernon	MW-15WT

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
3268	62	WC335	127

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method DRY WELL

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☒ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other DRY WELL	☒

3. Time spent developing well 20 min.

4. Depth of well (from top of well casisng) 85.53 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing DRY gal.

7. Volume of water removed from well 0.0 gal.

8. Volume of water added (if any) 3.0 gal.

9. Source of water added water provided by Vernon County Highway Department

10. Analysis performed on water added? (If yes, attach results) ☒ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 85.13 ft.	85.53 ft.
Date	b. 11 / 02 / 2022 (m m d d y y y y)	11 / 02 / 2022 (m m d d y y y y)
Time	c. 10 : 40 ☒ a.m. ☐ p.m.	11 : 00 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	inches	inches
13. Water clarity	Clear ☐ 10 Turbid ☐ 15 (Describe)	Clear ☐ 20 Turbid ☐ 25 (Describe)
14. Total suspended solids	mg/l	mg/l
15. COD	mg/l	mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Veronica Last Name: Aranda
Firm: Short Elliott Hendrickson Inc.

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Stacie Last Name: Sanborn
Facility/Firm: Vernon County Solid Waste
Street: S3705 County Road LF
City/State/Zip: Viroqua, WI 54665

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Veronica Aranda
Print Name: Veronica Aranda
Firm: Short Elliott Hendrickson Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Vernon County Landfill	Vernon	MW-16WT

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
3268	62	WC336	129

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☒ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 77.6 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 0.3 gal.

7. Volume of water removed from well 6.0 gal.

8. Volume of water added (if any) 3.0 gal.

9. Source of water added water provided by Vernon County Highway Department

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 75.70 ft.	76.23 ft.
Date	b. 11 / 02 / 2022 (m m d d y y y y)	11 / 02 / 2022 (m m d d y y y y)
Time	c. 11 : 30 ☒ a.m. ☐ p.m.	12 : 30 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.2 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) light brown sandy/silty	Clear ☐ 20 Turbid ☒ 25 (Describe) light brown
14. Total suspended solids	mg/l	mg/l
15. COD	mg/l	mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Veronica Last Name: Aranda
Firm: Short Elliott Hendrickson Inc.

17. Additional comments on development:
Purged dry and very slow recharge. Therefore, not enough water to collect a sample.

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Stacie Last Name: Sanborn
Facility/Firm: Vernon County Solid Waste
Street: S3705 County Road LF
City/State/Zip: Viroqua, WI 54665

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Veronica Aranda
Print Name: Veronica Aranda
Firm: Short Elliott Hendrickson Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Vernon County Landfill	Vernon	MW-16

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
3268	62	WC337	131

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☒ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 99.8 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 2.5 gal.

7. Volume of water removed from well 2.5 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 84.49 ft.	84.49 ft.
Date	b. 11 / 02 / 2022 (m m / d d / y y y y)	11 / 02 / 2022 (m m / d d / y y y y)
Time	c. 2 : 30 ☐ a.m. ☒ p.m.	3 : 30 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☐ 20 Turbid ☒ 25
(Describe)	light brown, little silt	light brown
14. Total suspended solids	mg/l	273.0 mg/l
15. COD	mg/l	11.5 mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Veronica Last Name: Aranda
Firm: Short Elliott Hendrickson Inc.

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Stacie Last Name: Sanborn
Facility/Firm: Vernon County Solid Waste
Street: S3705 County Road LF
City/State/Zip: Viroqua, WI 54665

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Veronica Aranda
Print Name: Veronica Aranda
Firm: Short Elliott Hendrickson Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Vernon County Landfill	Vernon	MW-17WT

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
3268	62	WC338	133

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method
- surged with bailer and bailed ☐ 41
- surged with bailer and pumped ☐ 61
- surged with block and bailed ☐ 42
- surged with block and pumped ☒ 62
- surged with block, bailed and pumped ☐ 70
- compressed air ☐ 20
- bailed only ☐ 10
- pumped only ☐ 51
- pumped slowly ☐ 50
- Other _____ ☐ [illegible]

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 89.2 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 0.6 gal.

7. Volume of water removed from well 25.0 gal.

8. Volume of water added (if any) 15.0 gal.

9. Source of water added water provided by Vernon County Highway Department

10. Analysis performed on water added? (If yes, attach results) ☒ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing) a.	85.53 ft.	84.98 ft.
Date b.	11 / 02 / 2022 (m m / d d / y y y y)	11 / 02 / 2022 (m m / d d / y y y y)
Time c.	9 : 30 ☒ a.m. ☐ p.m.	10 : 30 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.6 inches	1.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) light brown sandy/silty	Clear ☐ 20 Turbid ☒ 25 (Describe) light brown
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	mg/l	58.4 mg/l
15. COD	mg/l	11.0 mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Veronica Last Name: Aranda
Firm: Short Elliott Hendrickson Inc.

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Stacie Last Name: Sanborn
Facility/Firm: Vernon County Solid Waste
Street: S3705 County Road LF
City/State/Zip: Viroqua, WI 54665

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Veronica Aranda
Print Name: Veronica Aranda
Firm: Short Elliott Hendrickson Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

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Appendix P

In-Field Hydraulic Conductivity Testing Documents

IN-FIELD HYDRAULIC CONDUCTIVITY TESTS

The following pages contain the results obtained from in-field baildown tests conducted in the completed monitoring wells. Note that no drawdown could be measured in MW-7. This was due in part to the large depth to groundwater (196 feet), which made rapid water extraction with a bailer difficult. However, the permeability of the bedrock zone in which MW-7 is screened must also be relatively high, possibly exceeding 10^{-3} cm/sec.

The technique used to analyze the baildown recovery data is in accordance with the method described by Bouwer (1989). Thus, only the points which define a straight at the beginning of the baildown test are included in the analysis.

IN-FIELD PERMEABILITY TEST

DATE 3/24/88

FACILITY Vernon County

PIPE DIAMETER 2"

DEPTH TO STATIC WATER 152.33'

DEPTH TO BOTTOM 157.88'

SCREEN LENGTH 10.0'

SAND PACK LENGTH (L) 15.75'

WELL NUMBER MW-1

WELL LOCKED ? Yes

PROTECTIVE COVER ? Yes

I.D. NUMBER ?

BORE HOLE RADIUS (R) 3"

*Saturated Length = 5.55'

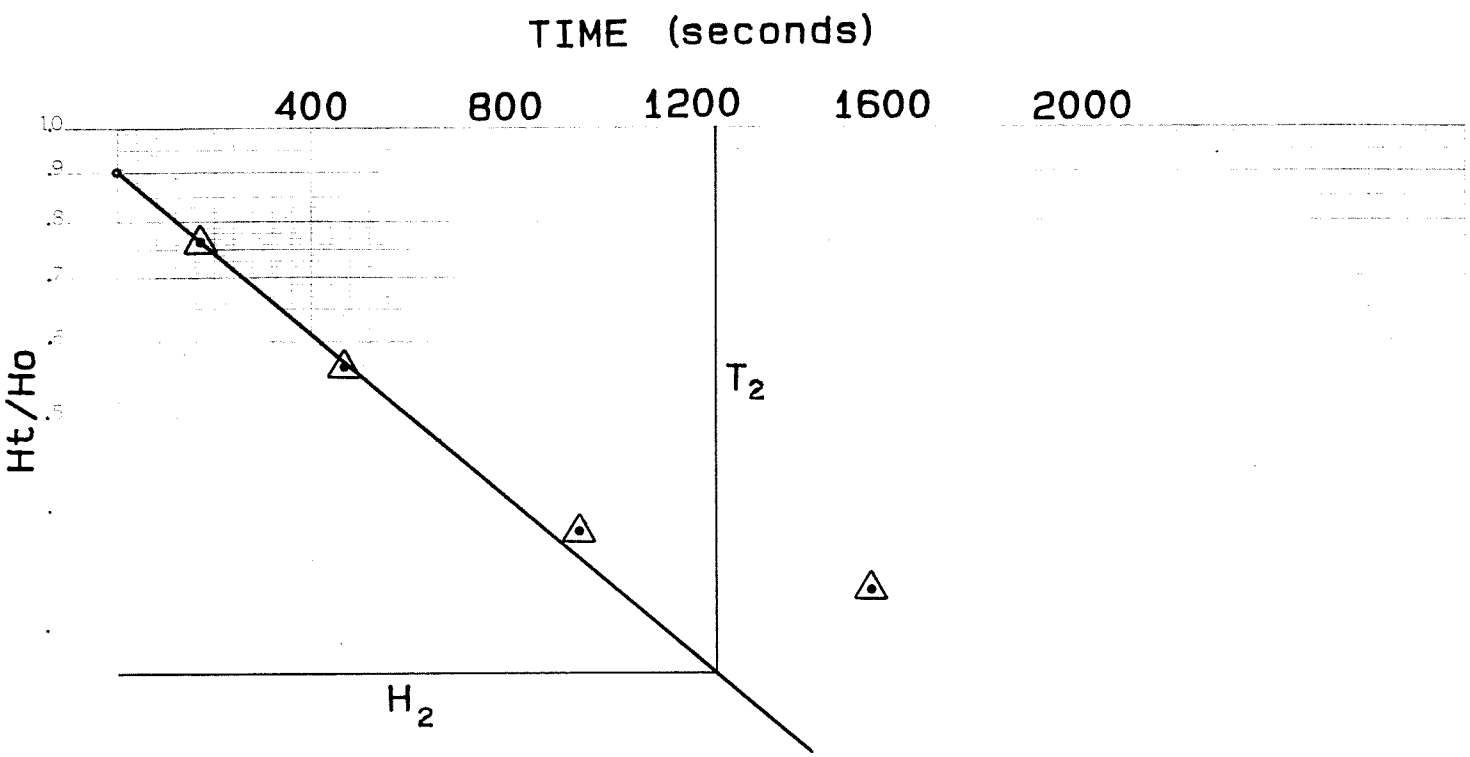
Time		Duration(sec.)	D_t	H_t	H_t/H_o
t_0	10:47:25	--	154.63	H_o= 2.30	--
t_1	10:50:13	168	154.08	1.75	0.76
t_2	10:55:18	473	153.63	1.30	0.57
t_3	11:03:24	959	153.21	0.88	0.38
t_4	11:13:33	1568	153.08	0.75	0.33
t_5	11:32:54	2729	152.67	0.34	0.15
t_6	11:58:14	4249	152.50	0.17	0.07
t_7	12:06:09	4724	152.42	0.09	0.04
t_8	12:14:39	5234	152.38	0.05	0.02
t_9	12:55:52	7707	152.33	0.0	0.0
t_{10}					
t_{11}					
t_{12}					
t_{13}					

$H_t = D_t$ - Static water depth

H_t = Depth to water at Time t

D_t = Depth to static water

$$K = \frac{r^2}{2L(t_2 - t_1)} \ln(L/R) \quad \ln(H_1/H_2)$$



MW-1

T_1 = 0 sec.
H_1 = 0.90
T_2 = 1240 sec.
H_2 = 0.27
L = 169.16 cm
r = 4.57 cm
R = 7.62 cm

$$K = \left[\frac{(4.57)^2}{2(169.16)(1240)}\right] \ln \frac{169.16}{7.62} \ln \frac{0.90}{0.27}$$

$$K = 1.86 \times 10^{-4} \text{ cm/sec}$$

IN-FIELD PERMEABILITY TEST

DATE 3/24/88

FACILITY Vernon County

PIPE DIAMETER 2"

DEPTH TO STATIC WATER 168.21'

DEPTH TO BOTTOM 174.58'

SCREEN LENGTH 10.0'

SAND PACK LENGTH (L) 19.42'

WELL NUMBER MW-2

WELL LOCKED ? Yes

PROTECTIVE COVER ? Yes

I.D. NUMBER ?

BORE HOLE RADIUS (R) 3"

*Saturated Length = 6.37'

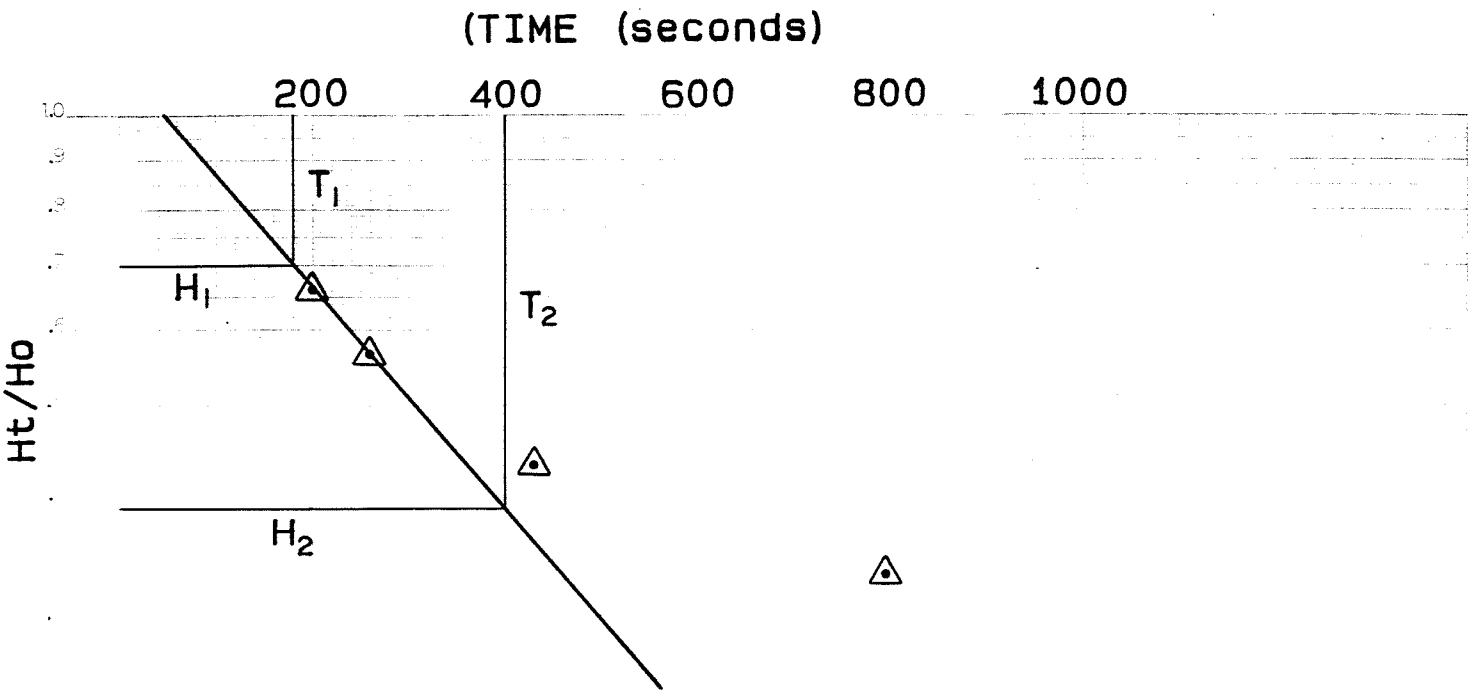
Time	Duration(sec.)	D_t	H_t	H_t/H_o
t_0 1:09:11	--	172.56	H_o= 4.35	--
t_1 1:12:30	199	171.08	2.87	0.66
t_2 1:13:31	260	170.67	2.46	0.56
t_3 1:16:18	427	170.08	1.87	0.43
t_4 1:22:30	799	169.67	1.46	0.34
t_5 1:33:05	1434	169.46	1.25	0.29
t_6 1:46:39	2248	169.42	1.21	0.28
t_7 3:24:00	8089	169.29	1.08	0.25
t_8				
t_9				
t_{10}				
t_{11}				
t_{12}				
t_{13}				

$H_t = D_t$ - Static water depth

H_t = Depth to water at Time t

D_t = Depth to static water

$$K = \frac{r^2}{2L(t_2 - t_1)} \ln(L/R) \quad \ln(H_1/H_2)$$



MW-2

T_1 = 180 sec.
H_1 = 0.70
T_2 = 400 sec.
H_2 = 0.39
L = 194.16 cm
r = 4.57 cm
R = 7.62 cm

$$K = \left[\frac{(4.57)^2}{2\,(194.16)\,(400-180)}\right] \ln \frac{194.16}{7.62} \ln \frac{0.70}{0.39}$$

$$K = 4.63 \times 10^{-4} \text{ cm/sec}$$

IN-FIELD PERMEABILITY TEST

DATE 3/14/88

FACILITY Vernon County

PIPE DIAMETER 2"

DEPTH TO STATIC WATER 169.42'

DEPTH TO BOTTOM 179.95'

SCREEN LENGTH 5.0'

SAND PACK LENGTH (L) 13.0'

WELL NUMBER MW-3

WELL LOCKED ? Yes

PROTECTIVE COVER ? Yes

I.D. NUMBER ?

BORE HOLE RADIUS (R) 3"

*Saturated Length = 10.53'

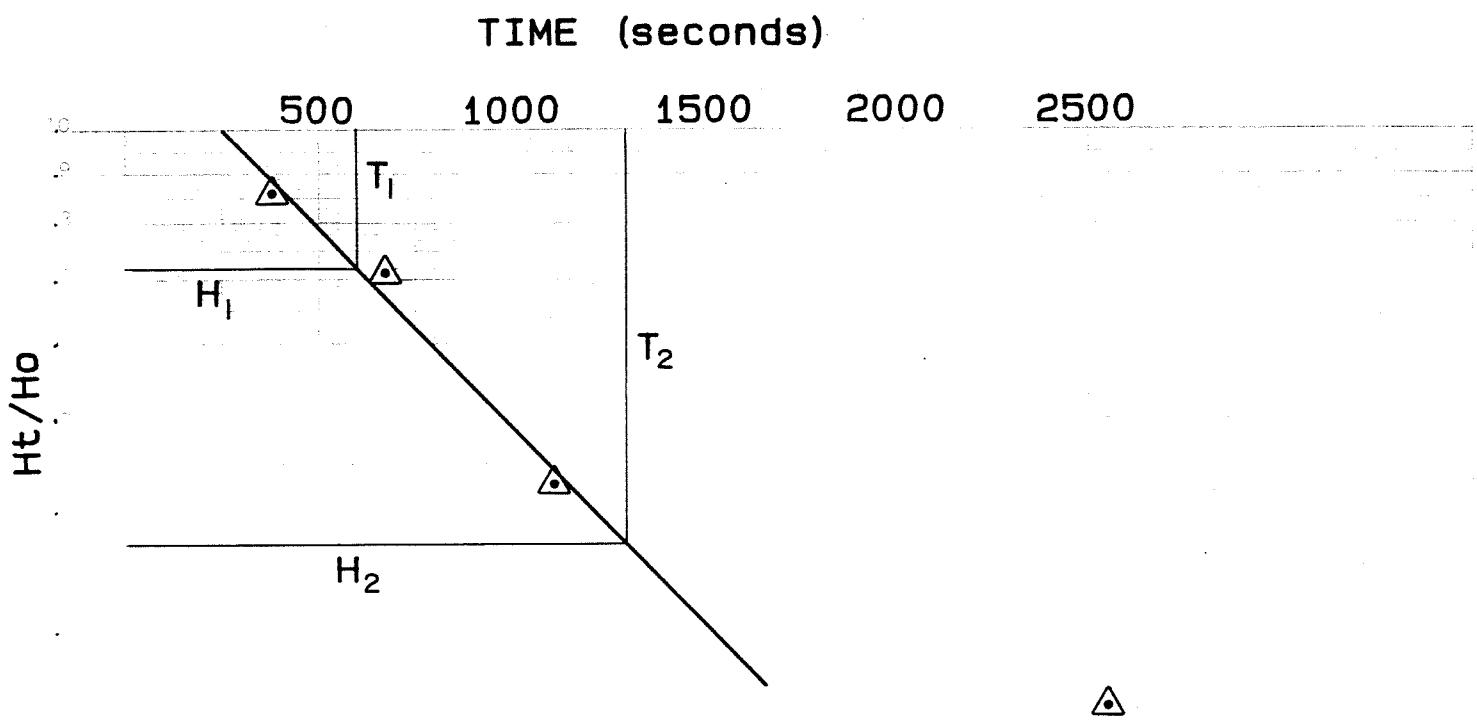
Time		Duration(sec.)	D_t	H_t	H_t/H_o
t_0	2:34:00	--	170.00	H_o= 0.58	--
t_1	2:40:23	383	169.92	0.50	0.86
t_2	2:45:15	675	169.83	0.41	0.71
t_3	2:52:30	1110	169.67	0.25	0.43
t_4	3:16:30	2550	169.56	0.14	0.24
t_5	3:54:00	4800	169.52	0.10	0.17
t_6	5:23:00	10140	169.46	0.04	0.07
t_7					
t_8					
t_9					
t_{10}					
t_{11}					
t_{12}					
t_{13}					

$H_t = D_t$ - Static water depth

H_t = Depth to water at Time t

D_t = Depth to static water

$$K = \frac{r^2}{2L(t_2 - t_1)} \ln(L/R) \quad \ln(H_1/H_2)$$



MW-3

T_1 = 600 sec.
H_1 = 0.72
T_2 = 1300 sec.
H_2 = 0.37
L = 320.95 cm
r = 4.57 cm
R = 7.62 cm

$$K = \left[\frac{(4.57)^2}{2(320.95)\ (1300-600)}\right] \ln \frac{320.95}{7.62} \ln \frac{0.72}{0.37}$$

$$K = 1.16 \times 10^{-4} \text{ cm/sec}$$

IN-FIELD PERMEABILITY TEST

DATE 3/24/88

FACILITY Vernon County

PIPE DIAMETER 2"

DEPTH TO STATIC WATER 147.67

DEPTH TO BOTTOM 152.60

SCREEN LENGTH 10.0'

SAND PACK LENGTH (L) 22.0'

WELL NUMBER MW-5

WELL LOCKED ? Yes

PROTECTIVE COVER ? Yes

I.D. NUMBER ?

BORE HOLE RADIUS (R) 3"

*Saturated Length = 4.93'

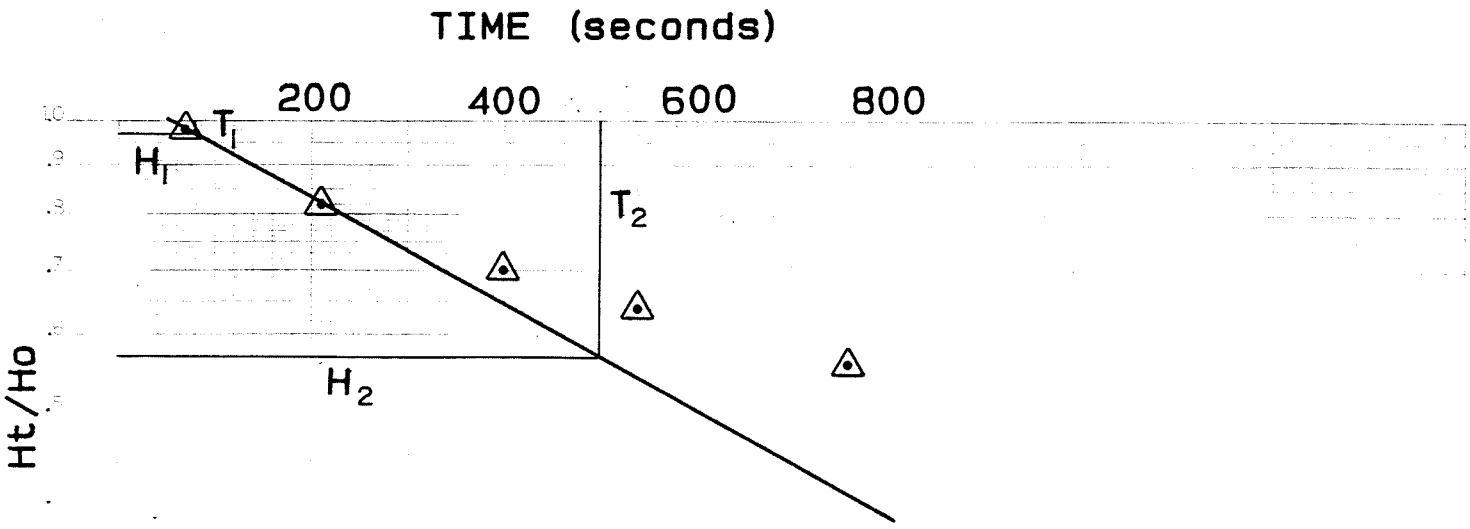
Time	Duration(sec.)	D_t	H_t	H_t/H_o
t_0 4:28:30	--	149.75	H_o= 2.08	--
t_1 4:29:40	70	149.71	2.04	0.98
t_2 4:32:00	210	149.38	1.71	0.82
t_3 4:35:08	398	149.13	1.46	0.70
t_4 4:37:30	540	149.00	1.33	0.64
t_5 4:41:10	760	148.83	1.16	0.56
t_6 5:09:00	2430	148.25	0.58	0.28
t_7				
t_8				
t_9				
t_{10}				
t_{11}				
t_{12}				
t_{13}				

$H_t = D_t$ - Static water depth

H_t = Depth to water at Time t

D_t = Depth to static water

$$K = \frac{r^2}{2L(t_2 - t_1)} \ln(L/R) \quad \ln(H_1/H_2)$$



MW-5

T_1 = 80 sec.
H_1 = 0.97
T_2 = 500 sec.
H_2 = 0.57
L = 150.27 cm
r = 4.57 cm
R = 7.62 cm

$$K = \left[\frac{(4.57)^2}{2(150.27)\ (500-80)}\right] \ln \frac{150.27}{7.62} \ln \frac{0.97}{0.57}$$

$$K = 2.62 \times 10^{-4} \text{cm/sec}$$

IN-FIELD PERMEABILITY TEST

DATE 12/27/89

FACILITY Vernon County

PIPE DIAMETER 2"

DEPTH TO STATIC WATER 91.12'

DEPTH TO BOTTOM 103.3'

SCREEN LENGTH 15.0'

SAND PACK LENGTH (L) 20.8'

WELL NUMBER MW-5A

WELL LOCKED ? Yes

PROTECTIVE COVER ? Yes

I.D. NUMBER ?

BORE HOLE RADIUS (R) 3"

*Saturated Length = 12.18'

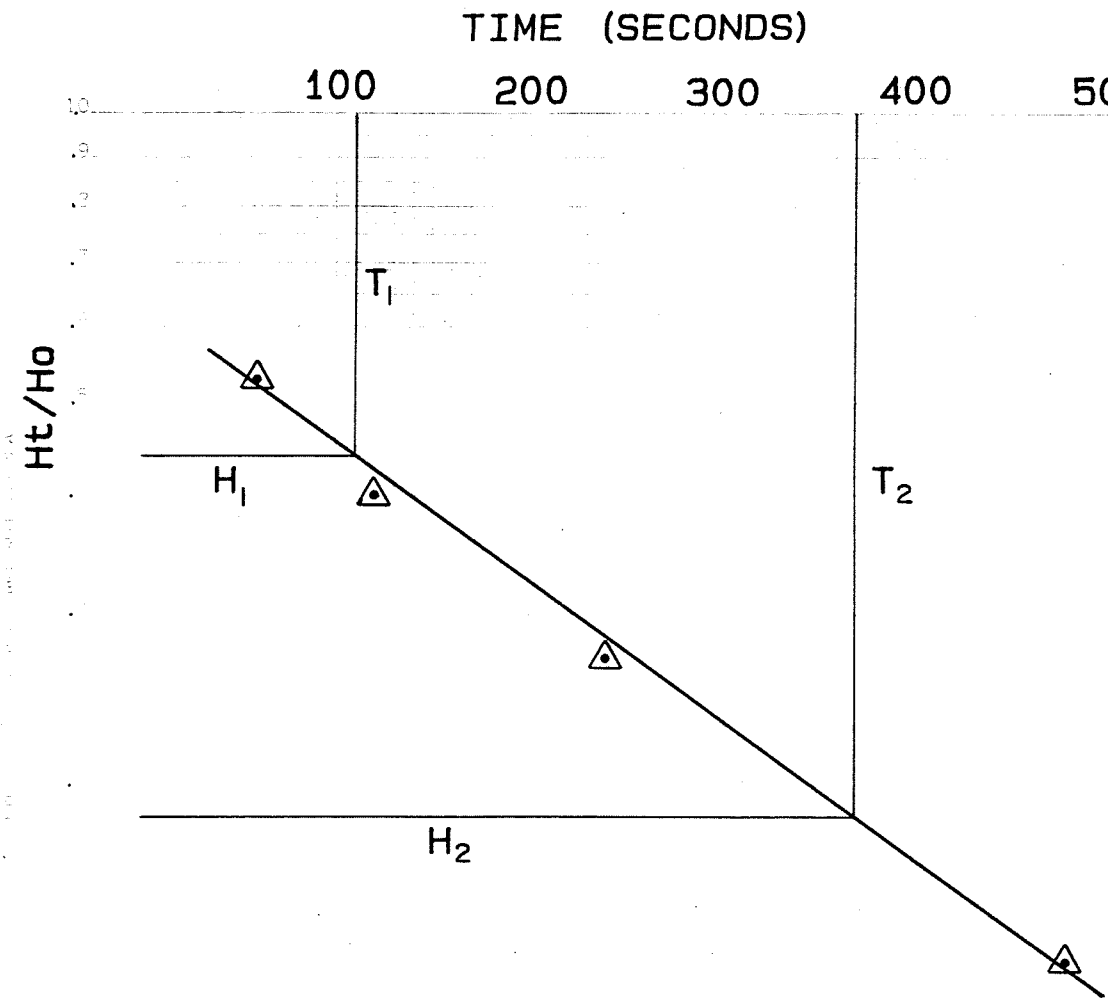
Time		Duration(sec.)	D_t	H_t	H_t/H_o
t_0	4:11:00	--	91.27	H_o= 0.15	--
t_1	4:12:00	60	91.20	0.08	0.53
t_2	4:13:00	120	91.18	0.06	0.40
t_3	4:15:00	240	91.16	0.04	0.27
t_4	4:19:00	480	91.14	0.02	0.13
t_5	4:27:00	960	91.12	0.00	0.00
t_6	4:28:00	2220	91.12	0.00	0.00
t_7					
t_8					
t_9					
t_{10}					
t_{11}					
t_{12}					
t_{13}					

$H_t = D_t$ - Static water depth

H_t = Depth to water at Time t

D_t = Depth to static water

$$K = \frac{r^2}{2L(t_2 - t_1)} \ln(L/R) \quad \ln(H_1/H_2)$$



MW-5A

T_1 = 110 sec.
H_1 = 0.44
T_2 = 370 sec.
H_2 = 0.185
L = 371.25 cm
r = 4.57 cm
R = 7.62 cm

$$K = \left[\frac{(4.57)^2}{2(371.25)\ (370-110)}\right] \ln \frac{371.25}{7.62} \quad \ln \frac{0.44}{0.185}$$

$$K = 3.64 \times 10^{-4} \text{ cm/sec}$$

IN-FIELD PERMEABILITY TEST

DATE 12/28/89

FACILITY Vernon County

PIPE DIAMETER 2"

DEPTH TO STATIC WATER 179.24'

DEPTH TO BOTTOM 202.3'

SCREEN LENGTH 5.0'

SAND PACK LENGTH (L) 19.0'

WELL NUMBER MW-6

WELL LOCKED ? Yes

PROTECTIVE COVER ? Yes

I.D. NUMBER ?

BORE HOLE RADIUS (R) 3"

*7.7 of filter pack below point, bore hole bottom @ 210' - filter pack top @ 191'; therefore, L = 19.0'

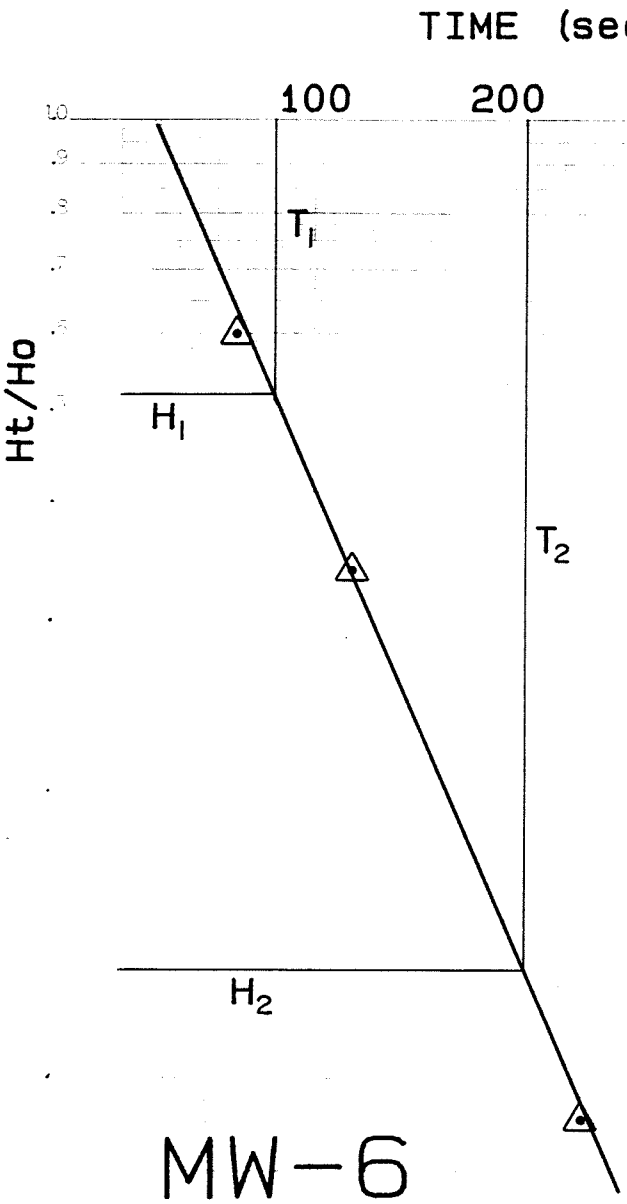
Time	Duration(sec.)	D_t	H_t	H_t/H_o
t_0 11:43:00	--	180.94	H_o= 1.70	--
t_1 11:44:00	60	180.26	1.02	0.60
t_2 11:45:00	120	179.81	0.57	0.34
t_3 11:47:00	240	179.39	0.15	0.09
t_4 11:51:00	480	179.17	-0.07	-0.04
t_5 11:59:00	960	179.12	-0.12	-0.07
t_6 12:17:00	2040	179.13	-0.11	-0.06
t_7 12:33:00	3000	179.12	-0.12	-0.07
t_8				
t_9				
t_{10}				
t_{11}				
t_{12}				
t_{13}				

$H_t = D_t$ - Static water depth

H_t = Depth to water at Time t

D_t = Depth to static water

$$K = \frac{r^2}{2L(t_2 - t_1)} \ln(L/R) \quad \ln(H_1/H_2)$$



MW-6

T_1 = 80 sec
H_1 = 0.52
T_2 = 210 sec
H_2 = 0.13
L = 579.12 cm
r = 2.54 cm
R = 7.62 cm

$$K = \left[\frac{(2.54)^2}{2(579.12)(210-80)}\right] \ln \frac{579.12}{7.62} \ln \frac{0.52}{0.13}$$

$$K = 2.57 \times 10^{-4} \text{ cm/sec}$$

IN-FIELD PERMEABILITY TEST

DATE 12/28/89

FACILITY Vernon County

PIPE DIAMETER 2"

DEPTH TO STATIC WATER 196.36'

DEPTH TO BOTTOM 234.5'

SCREEN LENGTH 5.0'

SAND PACK LENGTH (L) 8.0'

WELL NUMBER MW-7

WELL LOCKED ? Yes

PROTECTIVE COVER ? Yes

I.D. NUMBER ?

BORE HOLE RADIUS (R) 3"

*Bore hole bottom @ 234.5' - filter pack top @ 226.5'; therefore, L = 8.0'

Time	Duration(sec.)	D_t	H_t	H_t/H_o
t_0 10:16:00	--	196.40	H_o= 0.04	--
t_1 10:17:00	60	196.36	0.00	0.00
t_2 10:18:00	120	196.36	0.00	0.00
t_3 10:20:00	240	196.36	0.00	0.00
t_4				
t_5				
t_6				
t_7				
t_8				
t_9				
t_{10}				
t_{11}				
t_{12}				
t_{13}				

$H_t = D_t$ - Static water depth

H_t = Depth to water at Time t

D_t = Depth to static water

$$K = \frac{r^2}{2L(t_2 - t_1)} \ln(L/R) \quad \ln(H_1/H_2)$$

IN-FIELD PERMEABILITY TEST

DATE 12/28/89

FACILITY Vernon County

PIPE DIAMETER 2"

DEPTH TO STATIC WATER 193.76'

DEPTH TO BOTTOM 202.5'

SCREEN LENGTH 15.0'

SAND PACK LENGTH (L) 25.0'

WELL NUMBER MW-8R

WELL LOCKED ? Yes

PROTECTIVE COVER ? Yes

I.D. NUMBER ?

BORE HOLE RADIUS (R) 3"

*7.0' of filter pack below point. Saturated length = 15.74'.

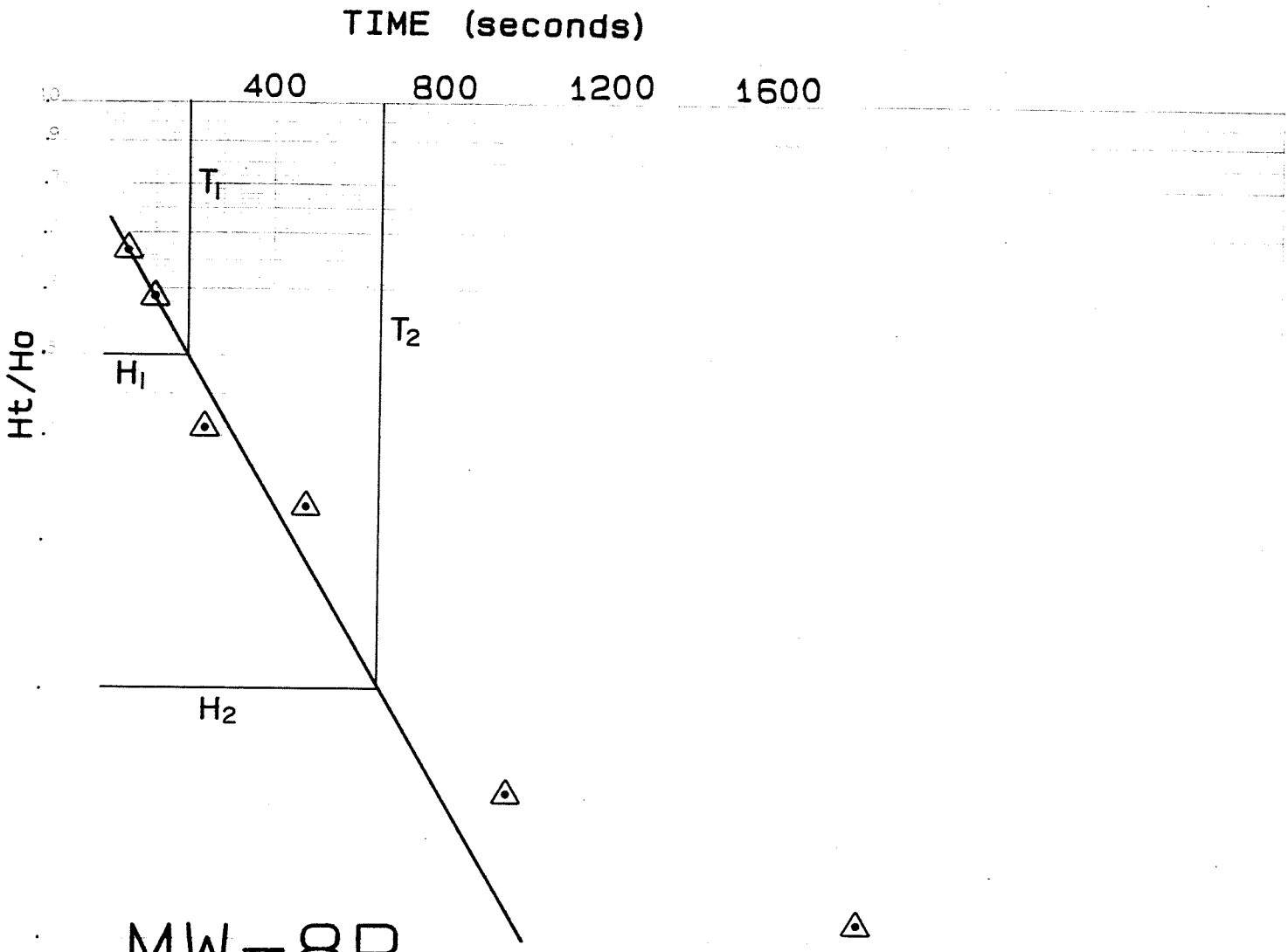
Time		Duration(sec.)	D_t	H_t	H_t/H_o
t_0	9:30:00	--	194.03	H_o= 0.27	--
t_1	9:31:00	60	193.94	0.18	0.67
t_2	9:32:00	120	193.92	0.16	0.59
t_3	9:34:00	240	193.87	0.11	0.41
t_4	9:38:00	480	193.85	0.09	0.33
t_5	9:46:00	960	193.80	0.04	0.15
t_6	10:00:00	1800	193.79	0.03	0.11
t_7	11:00:00	5400	193.70	-0.06	- 0.22
t_8					
t_9					
t_{10}					
t_{11}					
t_{12}					
t_{13}					

$H_t = D_t$ - Static water depth

H_t = Depth to water at Time t

D_t = Depth to static water

$$K = \frac{r^2}{2L(t_2 - t_1)} \ln(L/R) \quad \ln(H_1/H_2)$$



MW-8R

T_1 = 200 sec
H_1 = 0.5
T_2 = 650 sec
H_2 = 0.2
L = 479.76 cm
r = 4.57 cm
R = 7.62 cm

$$K = \left[\frac{(4.57)^2}{2(479.76)(650-200)}\right] \ln \frac{479.76}{7.62} \ln \frac{0.5}{0.2}$$

$$K = 1.84 \times 10^{-4} \text{ cm/sec}$$

IN-FIELD PERMEABILITY TEST

DATE 12/28/89

FACILITY Verhon County

PIPE DIAMETER 2"

DEPTH TO STATIC WATER 120.08

DEPTH TO BOTTOM 126.8'

SCREEN LENGTH 15.0'

SAND PACK LENGTH (L) 19.0'

WELL NUMBER MW-9

WELL LOCKED ? Yes

PROTECTIVE COVER ? Yes

I.D. NUMBER ?

BORE HOLE RADIUS (R) 3"

*Saturated Length = 6.72'

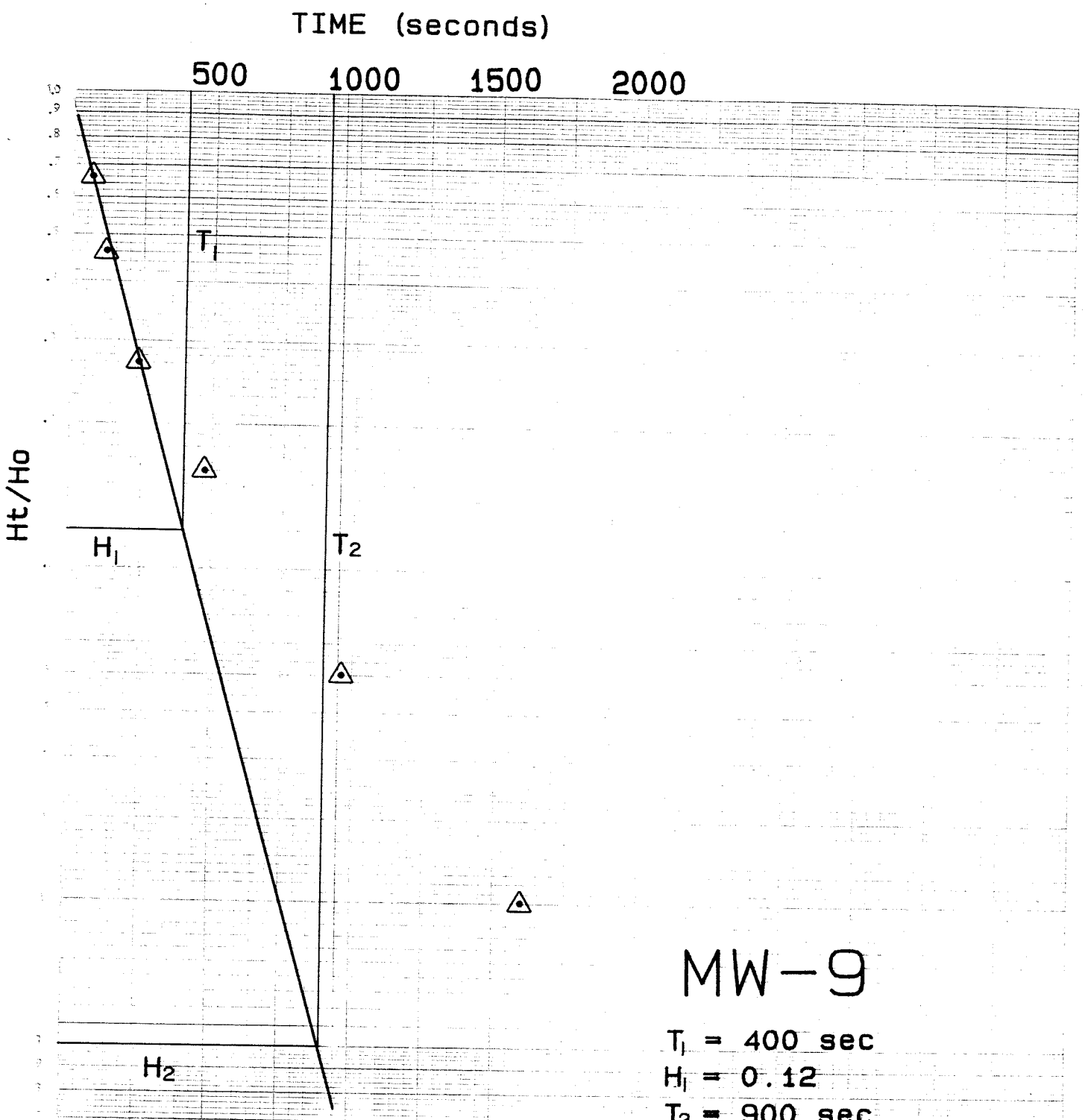
Time		Duration(sec.)	D_t	H_t	H_t/H_o
t_0	10:37:00	--	121.20	H_o= 1.12	--
t_1	10:38:00	60	120.82	0.74	0.66
t_2	10:39:00	120	120.60	0.52	0.46
t_3	10:41:00	240	120.38	0.30	0.27
t_4	10:45:00	480	120.26	0.18	0.16
t_5	10:53:00	960	120.15	0.07	0.06
t_6	11:07:00	1800	120.10	0.02	0.02
t_7	12:07:00	5400	120.08	0.00	0.00
t_8					
t_9					
t_{10}					
t_{11}					
t_{12}					
t_{13}					

$H_t = D_t$ - Static water depth

H_t = Depth to water at Time t

D_t = Depth to static water

$$K = \frac{r^2}{2L(t_2 - t_1)} \ln(L/R) \quad \ln(H_1/H_2)$$



MW-9

T_1 = 400 sec
H_1 = 0.12
T_2 = 900 sec
H_2 = 0.01
L = 204.83 cm
r = 4.57 cm
R = 7.62 cm

$$K = \left[\frac{(4.57)^2}{2(204.83)(900-400)}\right] \ln \frac{204.83}{7.62} \ln \frac{0.12}{0.01}$$

$$K = 8.34 \times 10^{-4} \text{ cm/sec}$$

IN-FIELD PERMEABILITY TEST

DATE 12/27/89

FACILITY Vernon County

PIPE DIAMETER 2"

DEPTH TO STATIC WATER 147.75'

DEPTH TO BOTTOM 183.5'

SCREEN LENGTH 5.0'

SAND PACK LENGTH (L) 6.0'

WELL NUMBER MW-10

WELL LOCKED ? Yes

PROTECTIVE COVER ? Yes

I.D. NUMBER ?

BORE HOLE RADIUS (R) 3"

*1.0' of filter pack below point - borehole bottom @ 184.5', filter pack top @ 178.5' - therefore, L = 6.0'

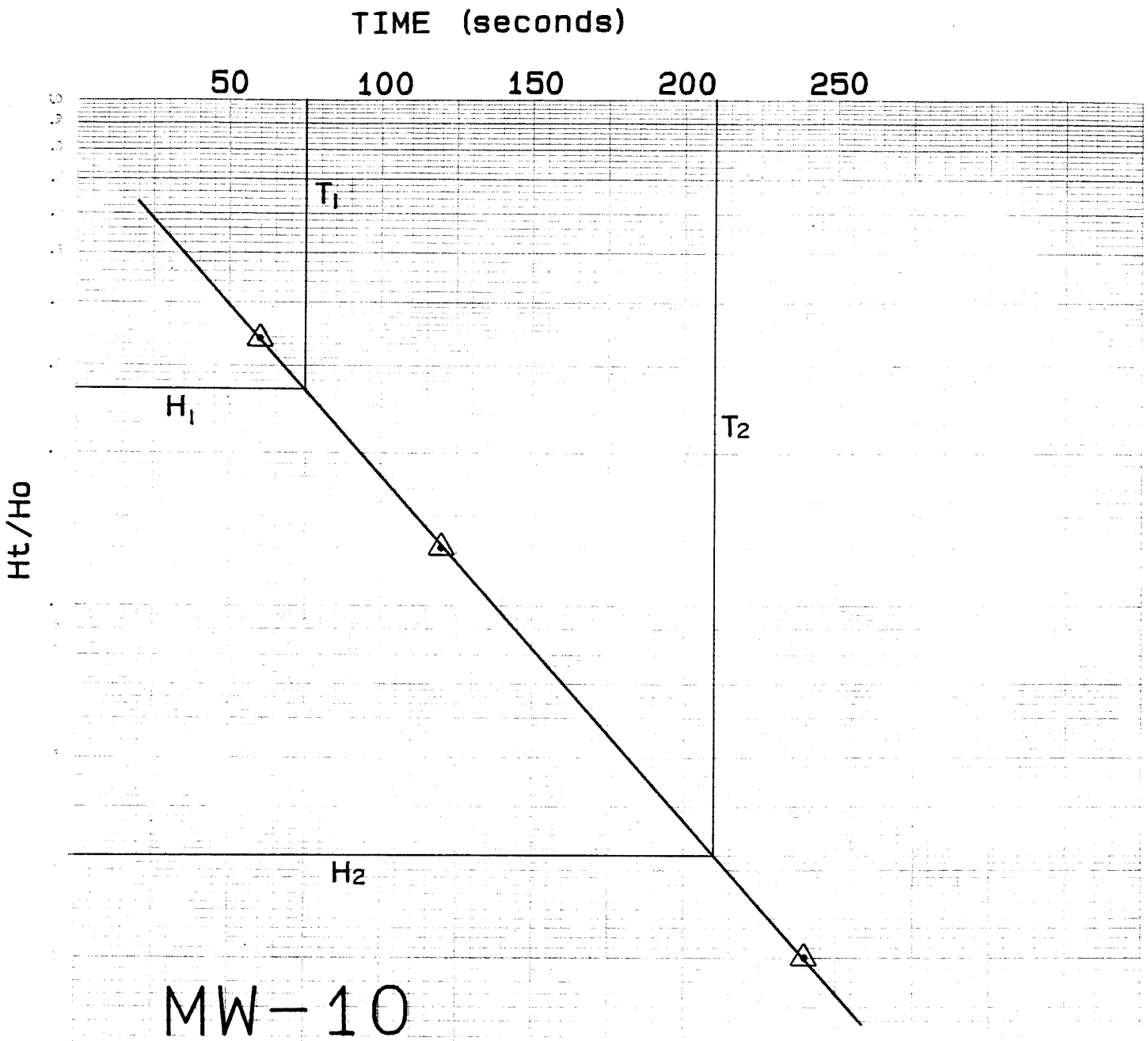
Time	Duration(sec.)	D_t	H_t	H_t/H_o
t_0 3:34:00	--	148.28	H_o= 0.53	--
t_1 3:35:00	60	147.93	0.18	0.34
t_2 3:36:00	120	147.82	0.07	0.13
t_3 3:38:00	240	147.76	0.01	0.02
t_4 3:42:00	480	147.75	0.00	0.00
t_5 3:50:00	960	147.75	0.00	0.00
t_6				
t_7				
t_8				
t_9				
t_{10}				
t_{11}				
t_{12}				
t_{13}				

$H_t = D_t$ - Static water depth

H_t = Depth to water at Time t

D_t = Depth to static water

$$K = \frac{r^2}{2L(t_2 - t_1)} \ln(L/R) \quad \ln(H_1/H_2)$$



MW-10

T_1 = 75 sec
H_1 = 0.27
T_2 = 210 sec
H_2 = 0.032
L = 182.88
r = 2.54 cm
R = 7.62 cm

$$K = \left[\frac{(2.54)^2}{2(182.88)(210-75)}\right] \ln\frac{182.88}{7.62} \ln\frac{0.27}{0.032}$$

$$K = 8.86 \times 10^{-4} \text{ cm/sec}$$

IN-FIELD PERMEABILITY TEST

DATE 12/27/89

FACILITY Vernon County

PIPE DIAMETER 2"

DEPTH TO STATIC WATER 146.03'

DEPTH TO BOTTOM 162.5'

SCREEN LENGTH 15.0'

SAND PACK LENGTH (L) 24.0'

WELL NUMBER MW-11

WELL LOCKED ? Yes

PROTECTIVE COVER ? Yes

I.D. NUMBER ?

BORE HOLE RADIUS (R) 3"

*3.0' of filter pack below point
Saturated length = 19.47'

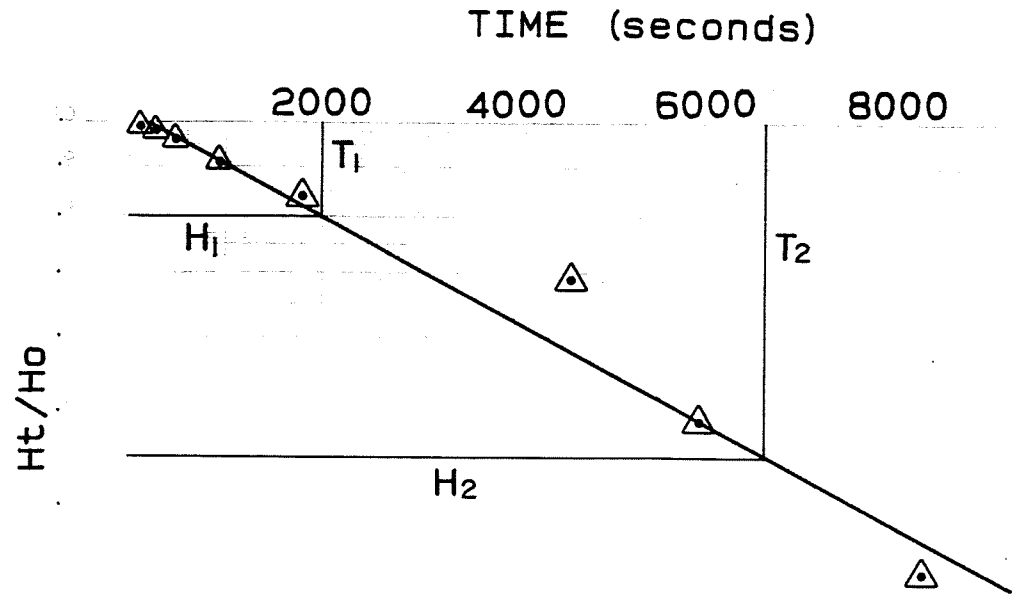
Time	Duration(sec.)	D_t	H_t	H_t/H_o
t_0 2:22:00	--	160.10	H_o= 14.07	--
t_1 2:23:00	60	160.04	14.01	1.00
t_2 2:24:00	120	159.95	13.92	0.99
t_3 2:26:30	270	159.75	13.72	0.98
t_4 2:30:00	480	159.49	13.46	0.96
t_5 2:38:00	960	158.88	12.85	0.91
t_6 2:52:00	1800	157.83	11.80	0.84
t_7 3:22:00	3600	155.73	9.70	0.69
t_8 4:01:00	5940	152.99	6.96	0.49
t_9 4:40:00	8280	150.84	4.81	0.34
t_{10}				
t_{11}				
t_{12}				
t_{13}				

$H_t = D_t$ - Static water depth

H_t = Depth to water at Time t

D_t = Depth to static water

$$K = \frac{r^2}{2L(t_2 - t_1)} \ln(L/R) \quad \ln(H_1/H_2)$$



MW-11

T_1 = 2000 sec
H_1 = 0.8
T_2 = 6600 sec
H_2 = 0.45
L = 593.45 cm
r = 4.57 cm
R = 7.62 cm

$$K = \left[\frac{(4.57)^2}{2(593.45)\ (6600-2000)}\right] \ln \frac{593.45}{7.62} \ln \frac{0.80}{0.45}$$

$$K = 9.59 \times 10^{-6} \text{ cm/sec}$$

IN-FIELD PERMEABILITY TEST

DATE 12/27/89

FACILITY Vernon County

PIPE DIAMETER 2"

DEPTH TO STATIC WATER 90.07'

DEPTH TO BOTTOM 98.5'

SCREEN LENGTH 15.0'

SAND PACK LENGTH (L) 26.0'

WELL NUMBER MW-12

WELL LOCKED ? Yes

PROTECTIVE COVER ? Yes

I.D. NUMBER ?

BORE HOLE RADIUS (R) 3"

*7.0' of filter pack below point
Saturated length = 15.43'

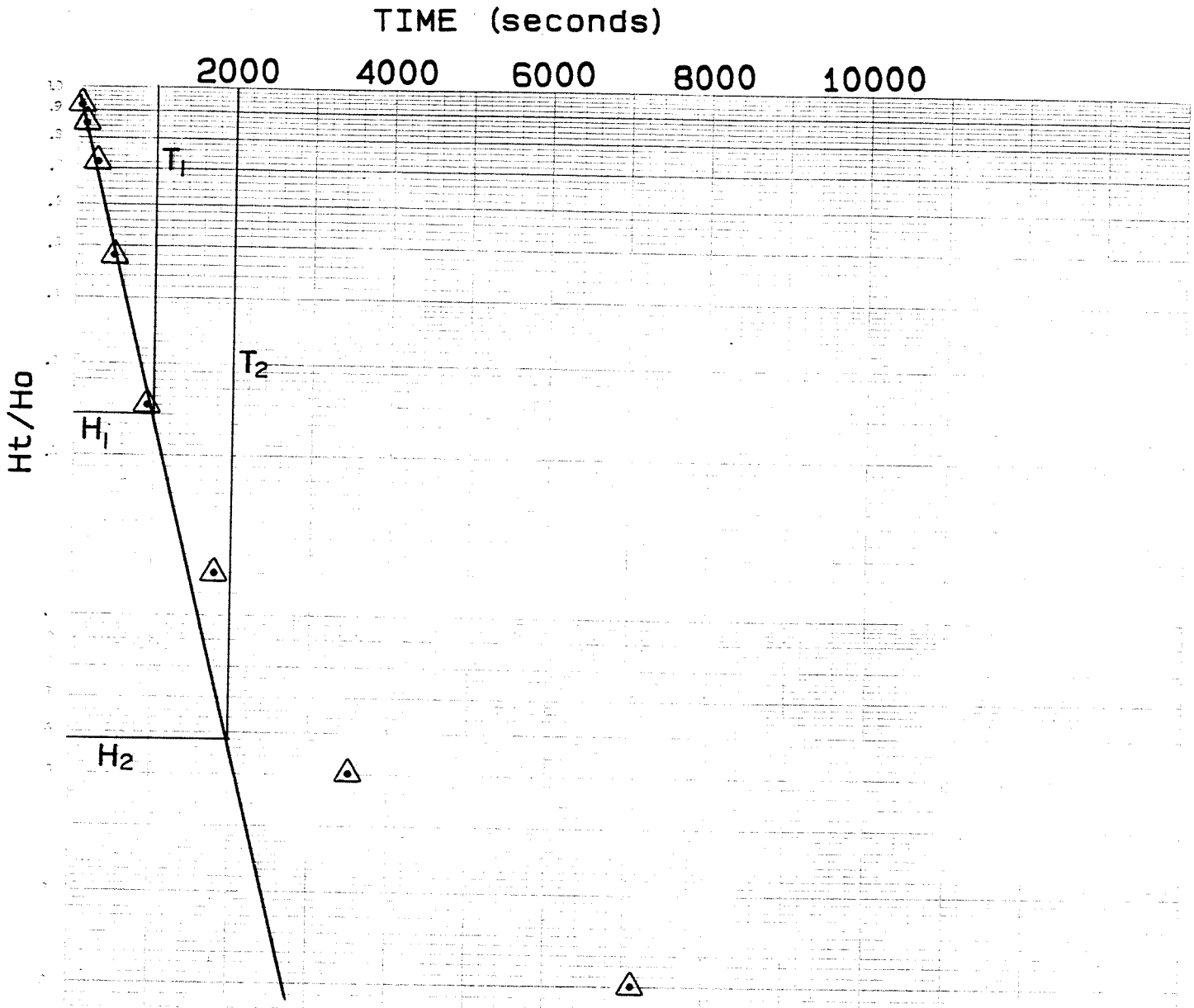
Time	Duration(sec.)	D_t	H_t	H_t/H_o
t_0 1:47:00	--	93.96	H_o= 3.89	--
t_1 1:48:00	60	93.62	3.55	0.91
t_2 1:49:00	120	93.37	3.30	0.85
t_3 1:51:00	240	92.86	2.79	0.72
t_4 1:55:00	480	91.93	1.86	0.48
t_5 2:03:00	960	91.04	0.97	0.25
t_6 2:17:00	1800	90.54	0.47	0.12
t_7 2:46:00	3540	90.26	0.19	0.05
t_8 3:46:00	7140	90.15	0.08	0.02
t_9 4:36:00	10140	90.12	0.05	0.01
t_{10}				
t_{11}				
t_{12}				
t_{13}				

$H_t = D_t$ - Static water depth

H_t = Depth to water at Time t

D_t = Depth to static water

$$K = \frac{r^2}{2L(t_2 - t_1)} \ln(L/R) \quad \ln(H_1/H_2)$$



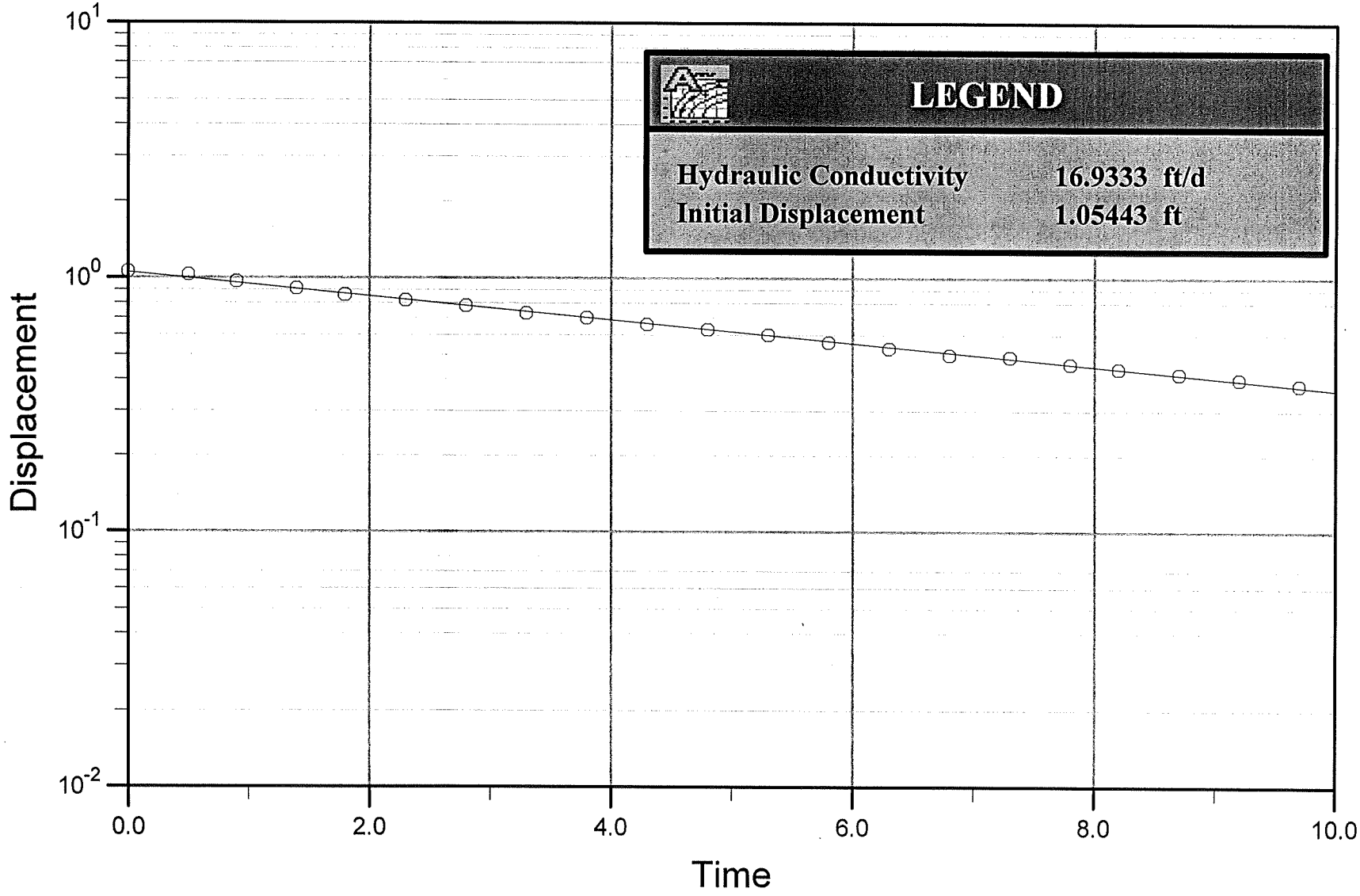
MW-12

T_1 = 1000 sec
H_1 = 0.24
T_2 = 2000 sec
H_2 = 0.058
L = 470.31 cm
r = 4.57 cm
R = 7.62 cm

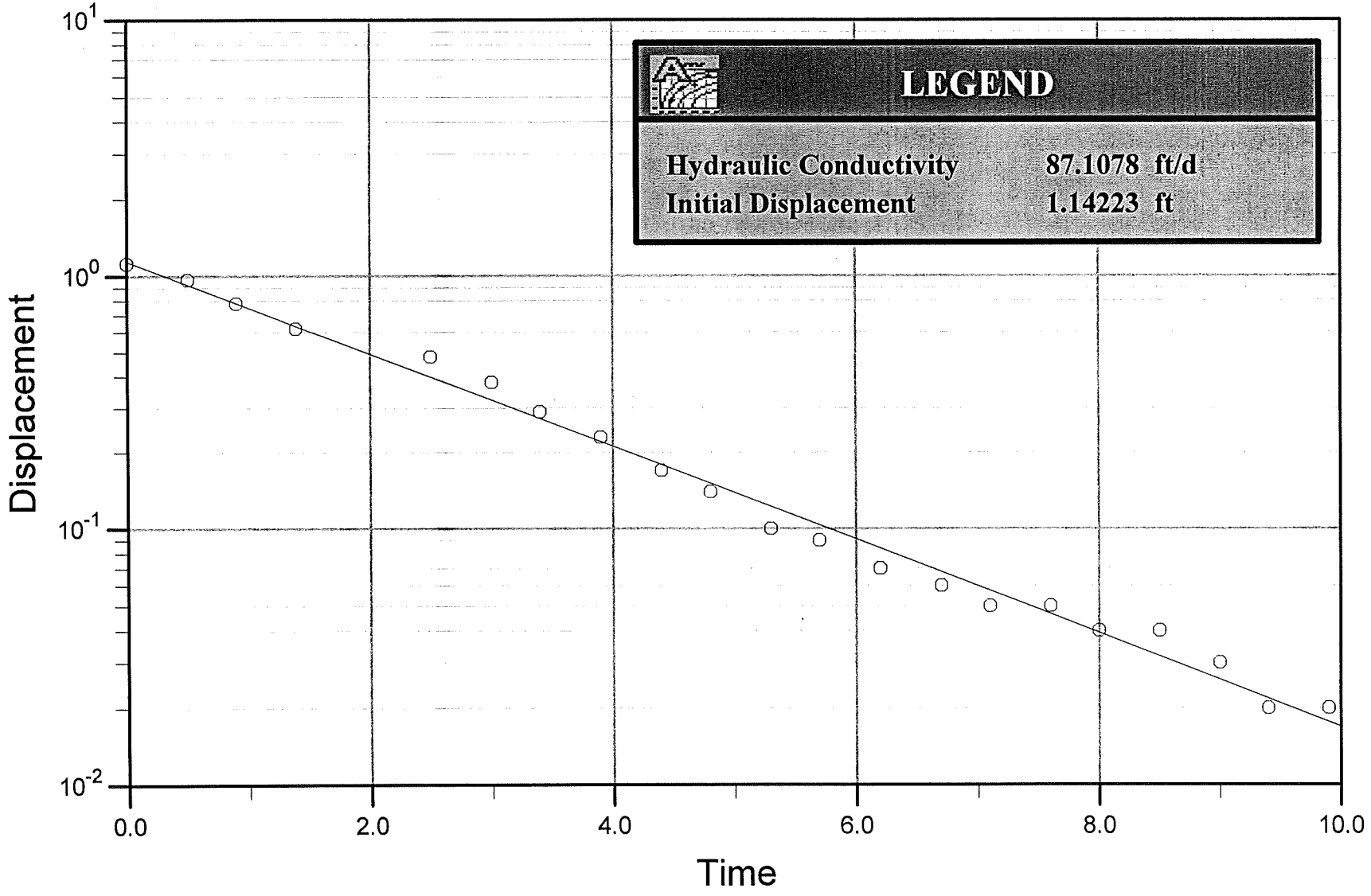
$$K = \left[\frac{(4.57)^2}{2(470.31)(2000-1000)}\right] \ln\frac{470.31}{7.62} \ln\frac{0.24}{0.058}$$

$$K = 1.30 \times 10^{-4} \text{ cm/sec}$$

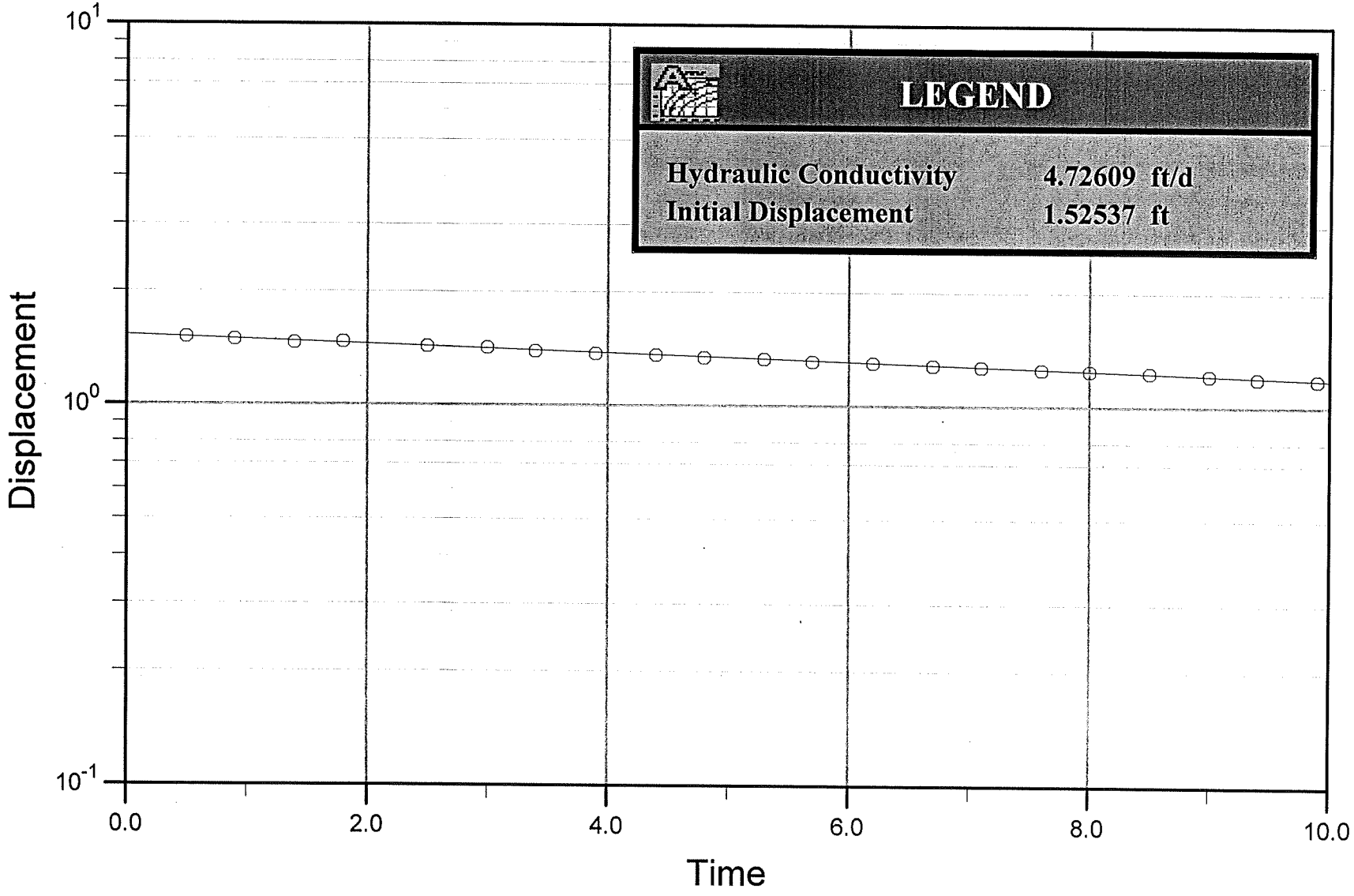
Bower and Rice Analysis of Slug Test in MW-1PR



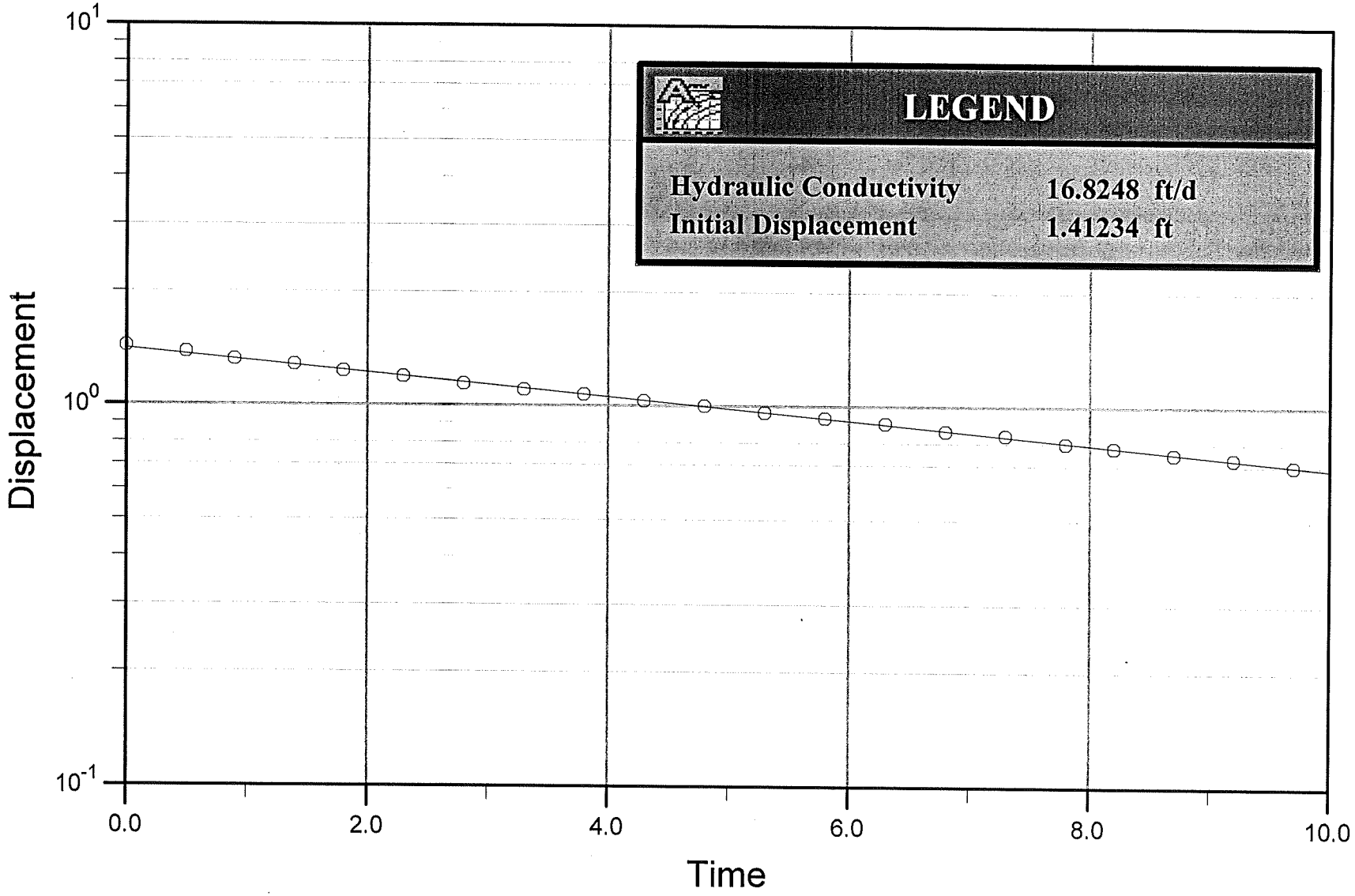
Bower and Rice Analysis of Slug Test in MW-1RZ



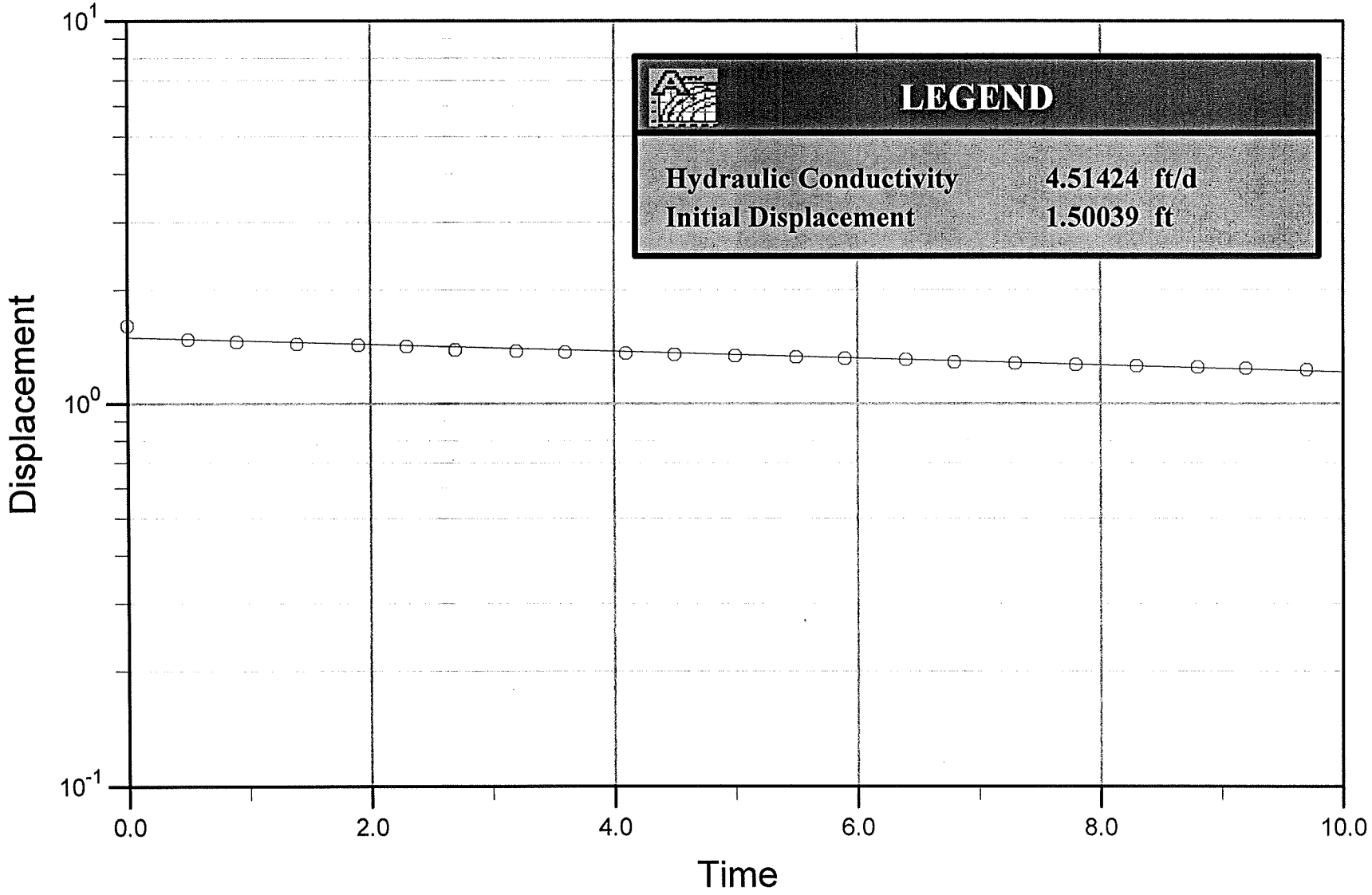
Bower and Rice Analysis of Slug Test in MW-3



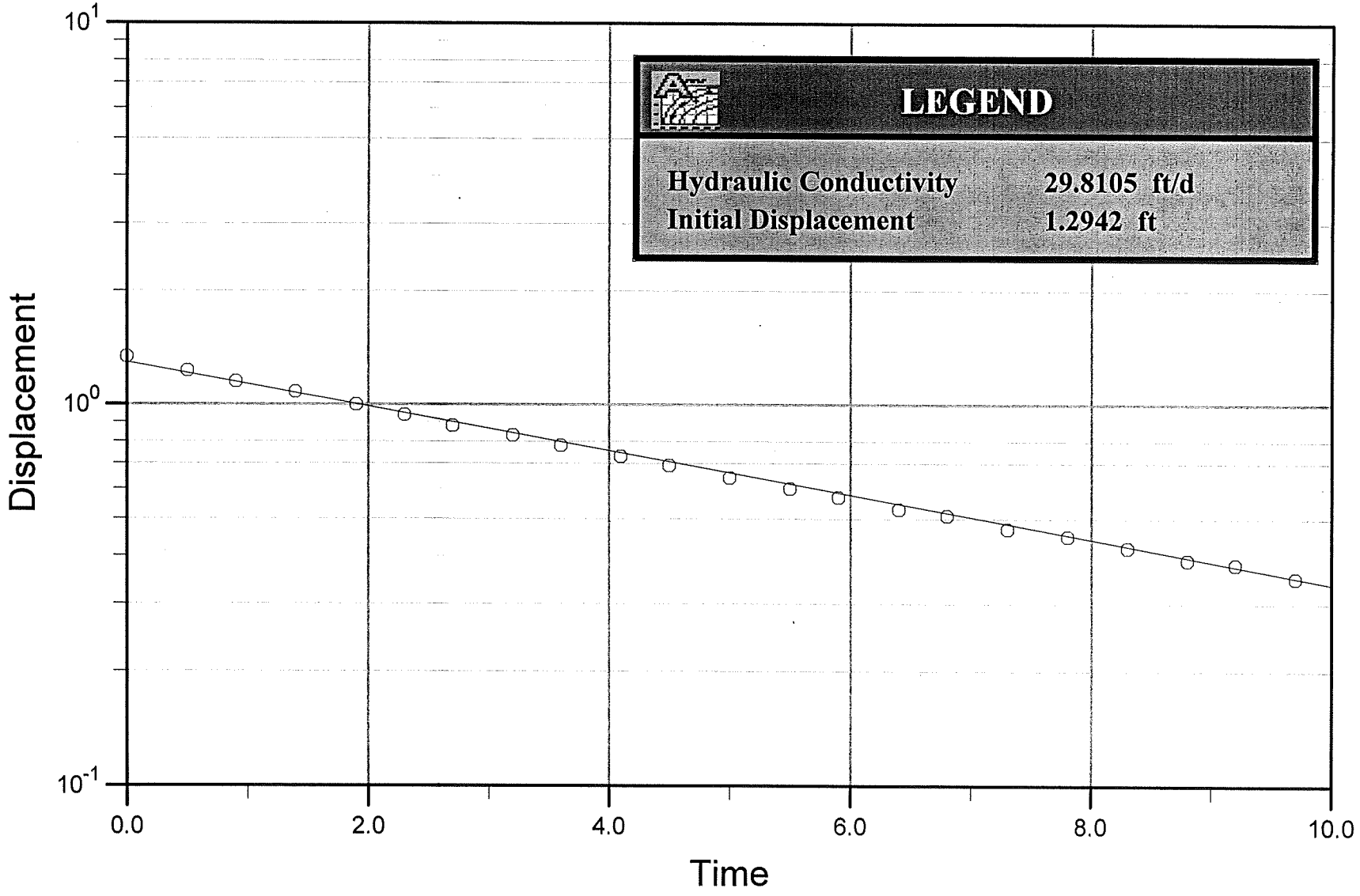
Bower and Rice Analysis of Slug Test in MW-4P



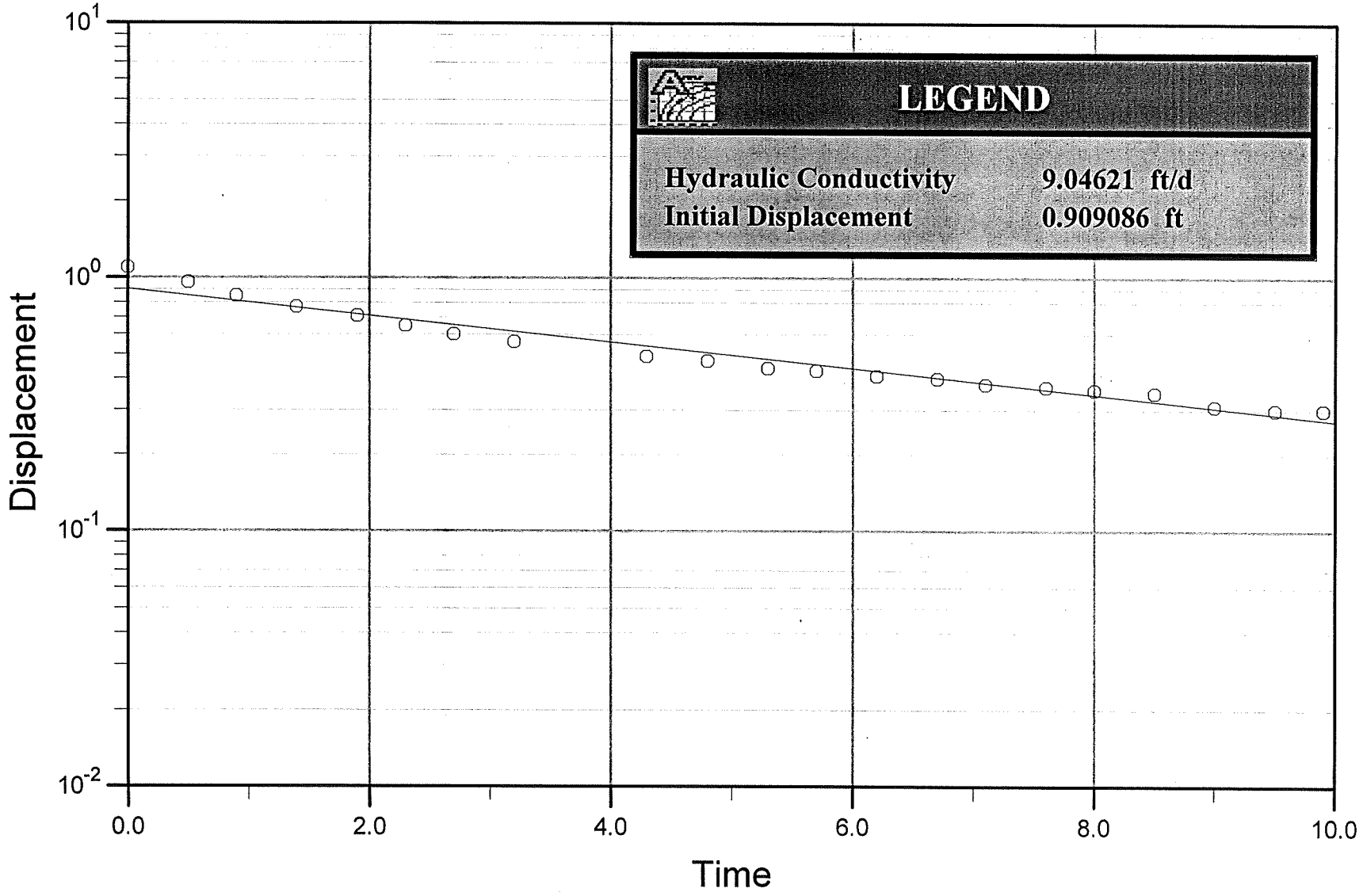
Bower and Rice Analysis of Slug Test in MW-6



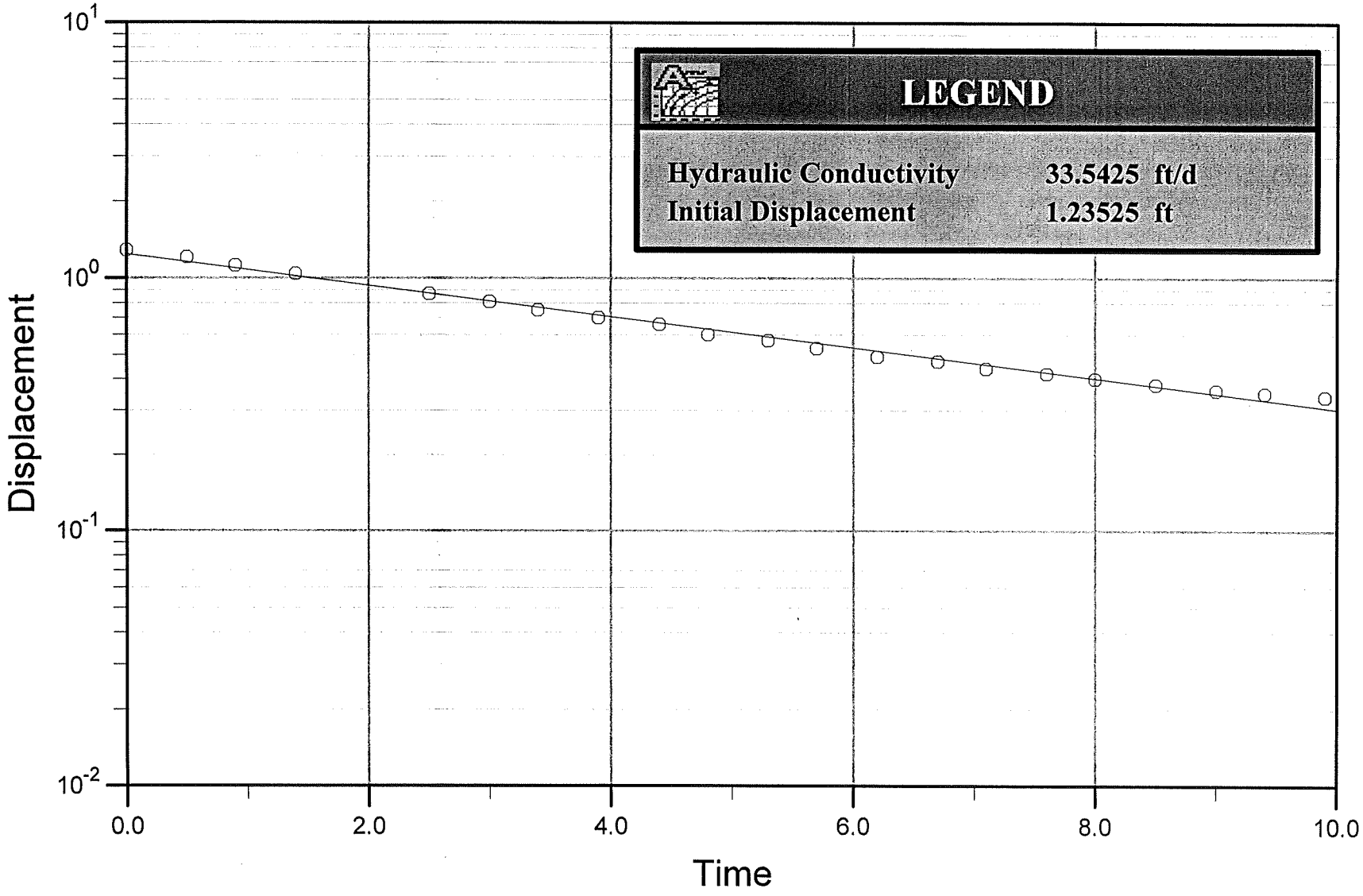
Bower and Rice Analysis of SlugTest in MW-7



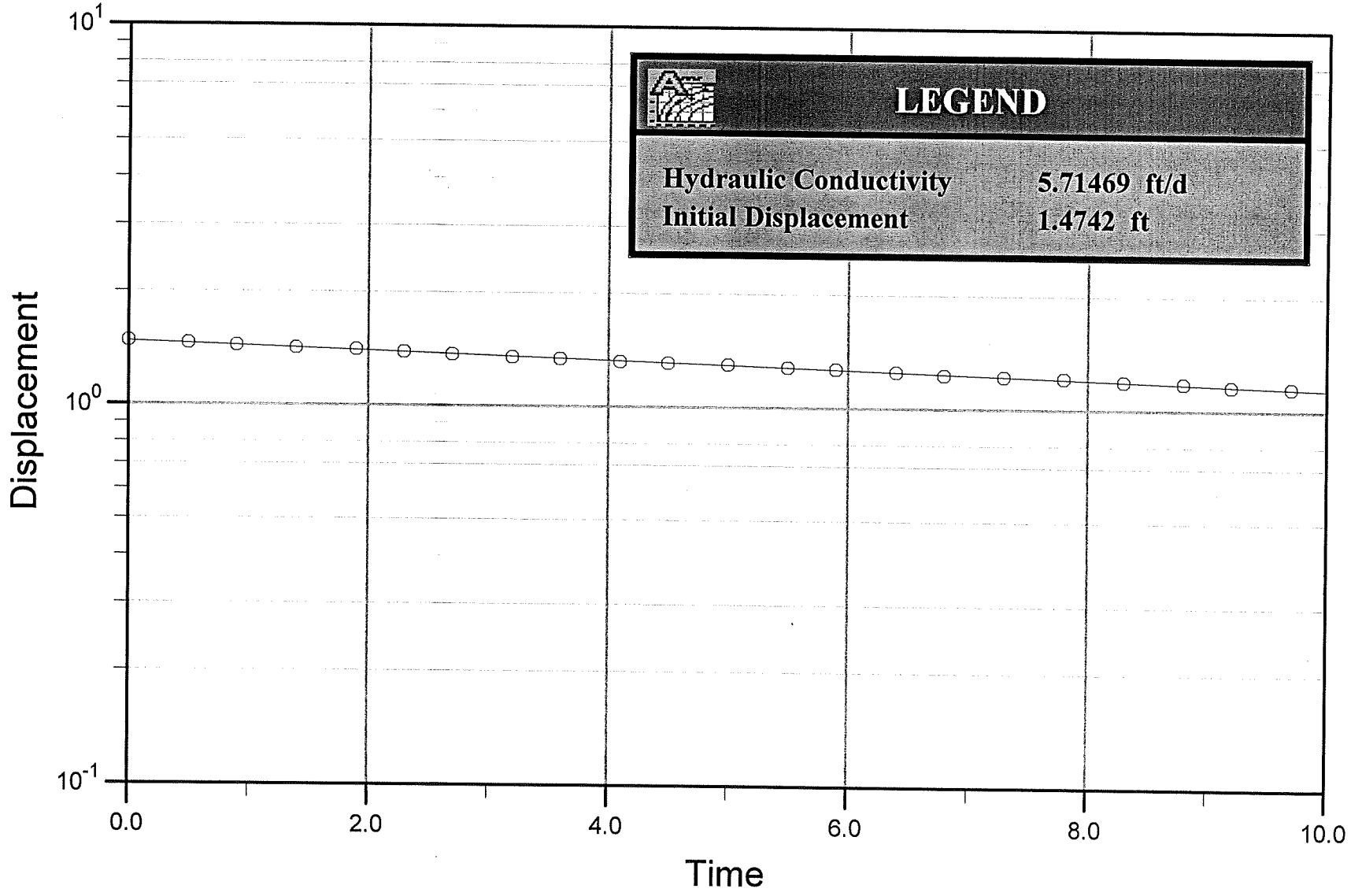
Bower and Rice Analysis of Slug Test in MW-8R



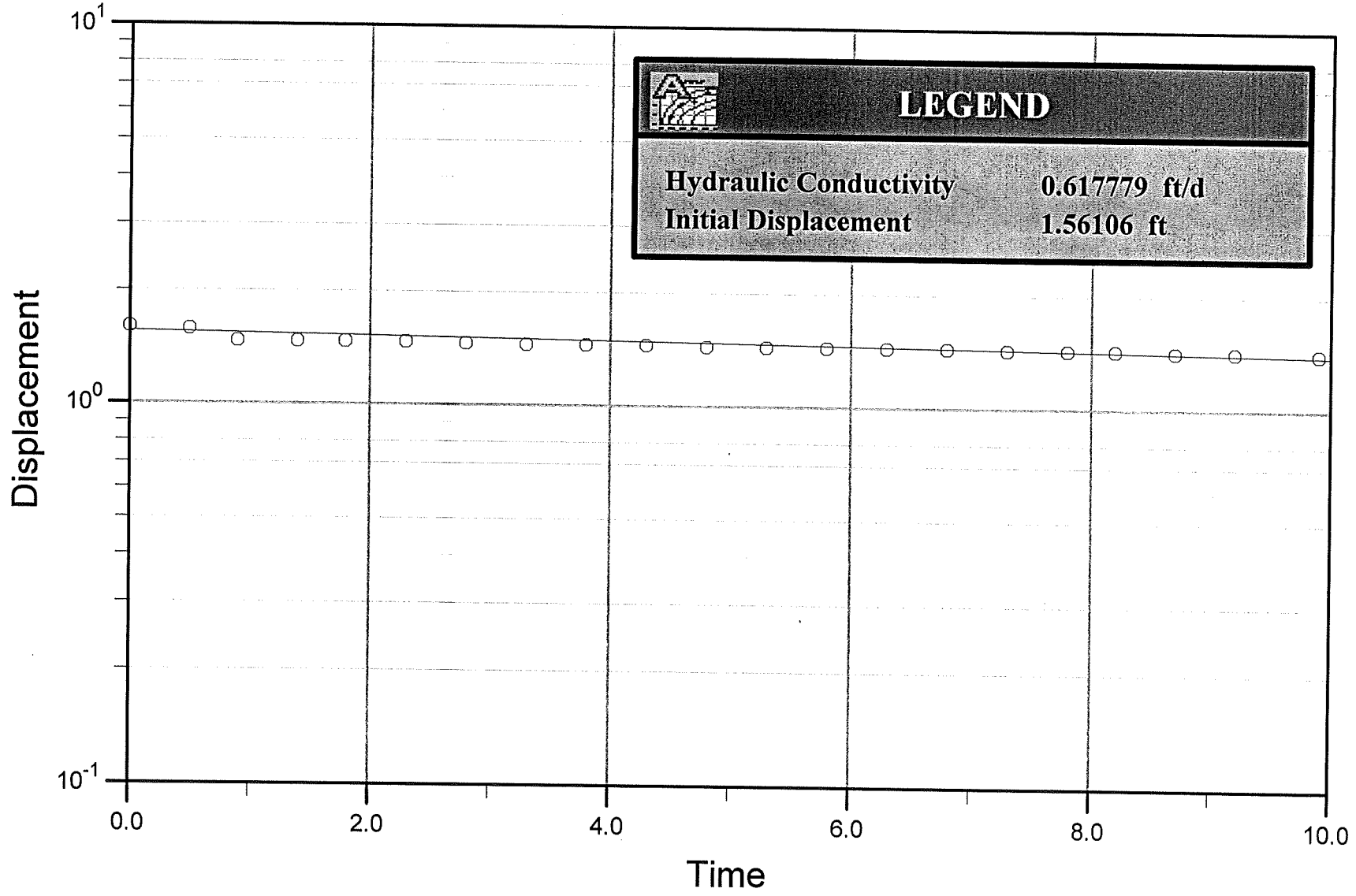
Bower and Rice Analysis of Slug Test in MW-9



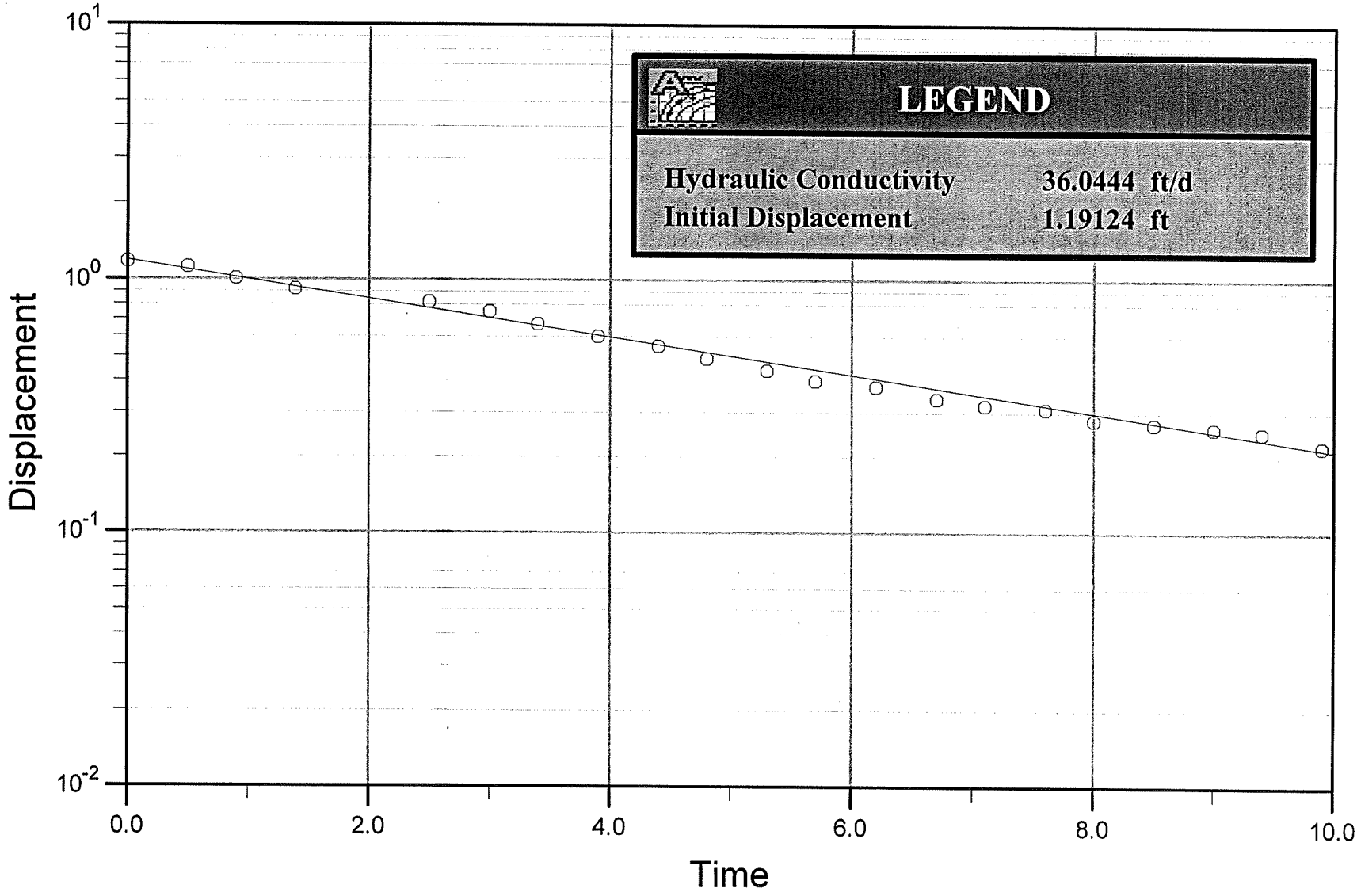
Bower and Rice Analysis of Slug Test in MW-10



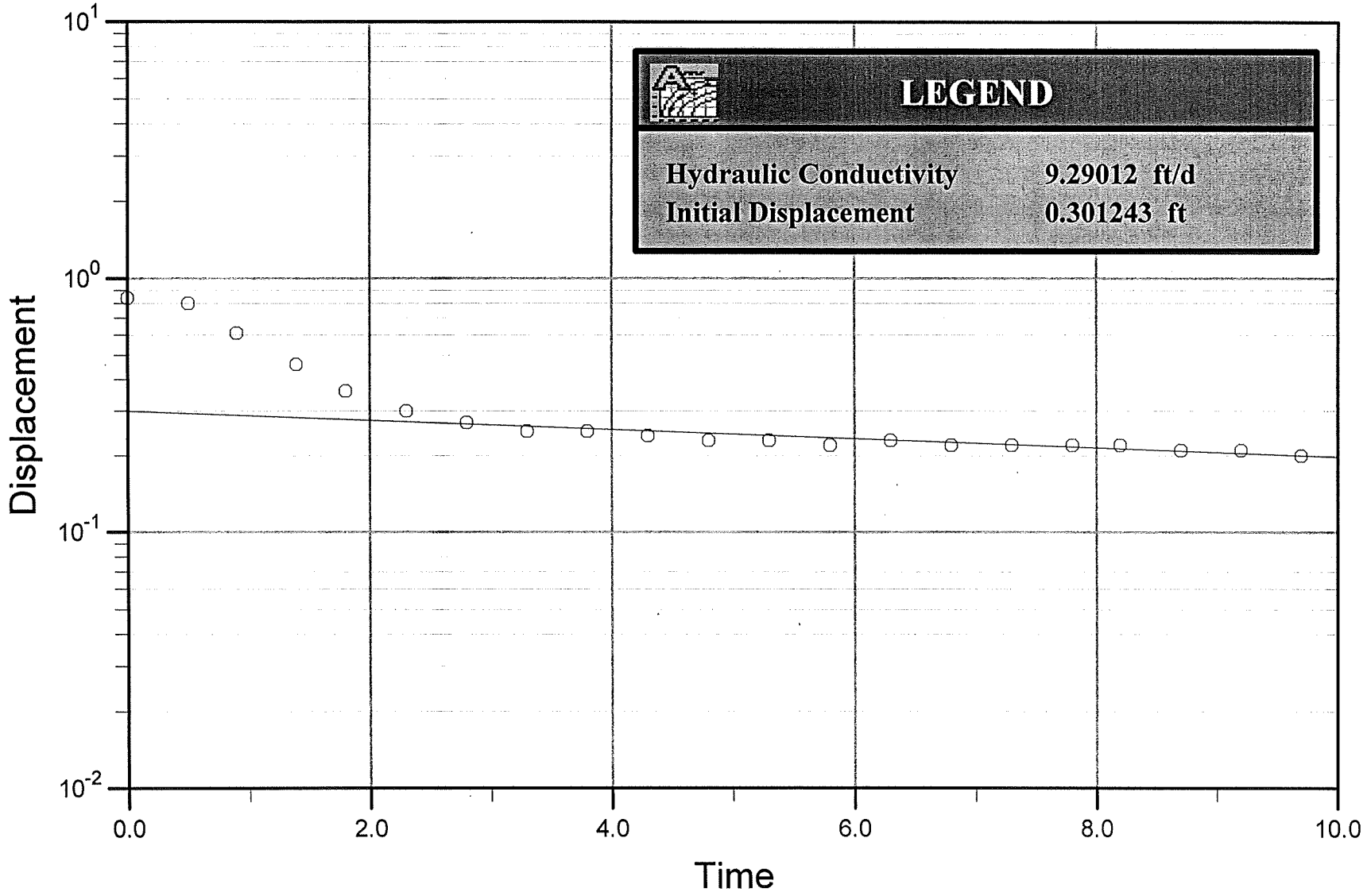
Bower and Rice Analysis of Slug Test in MW-11



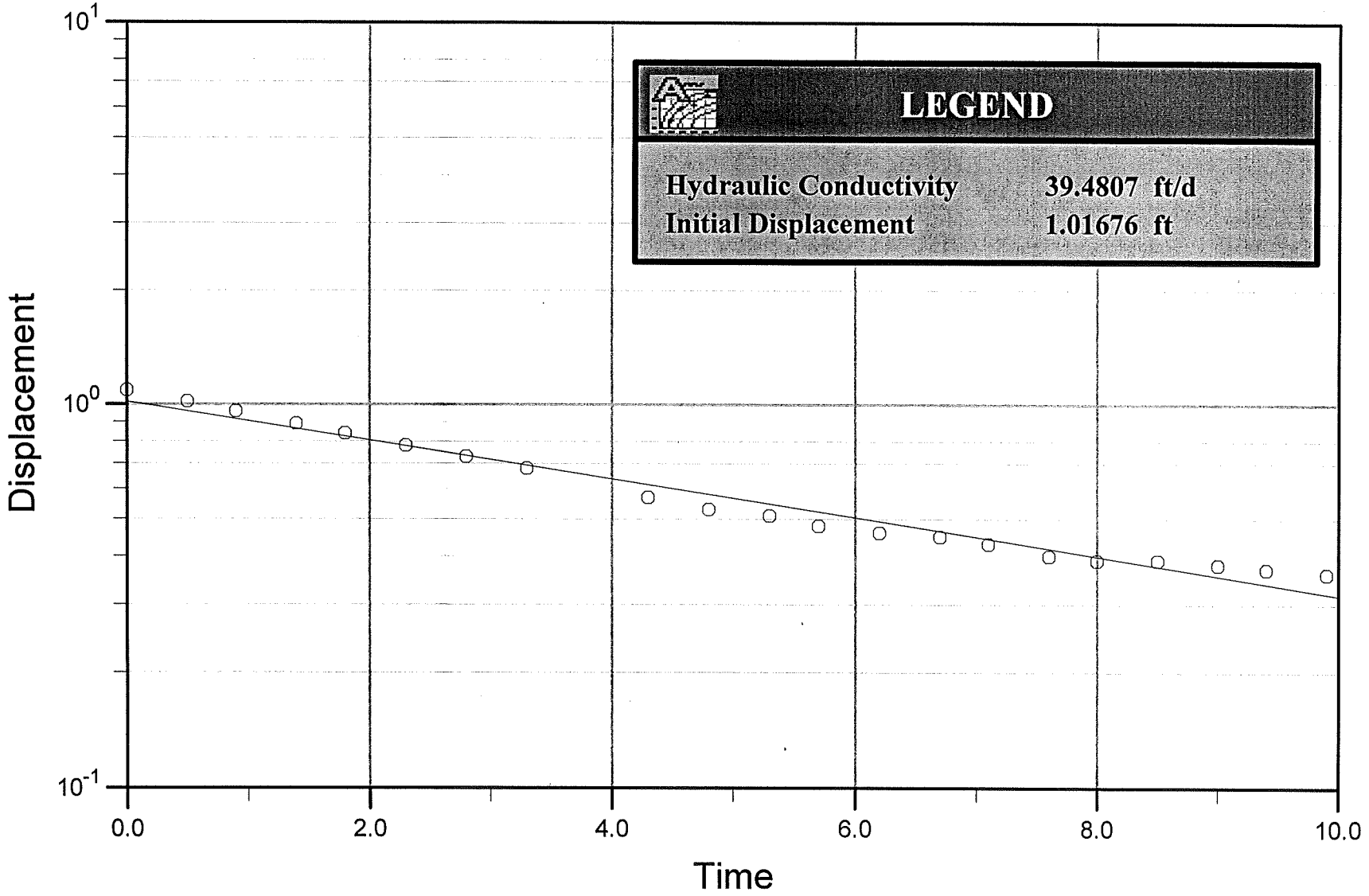
Bower and Rice Analysis of Slug Test in MW-12



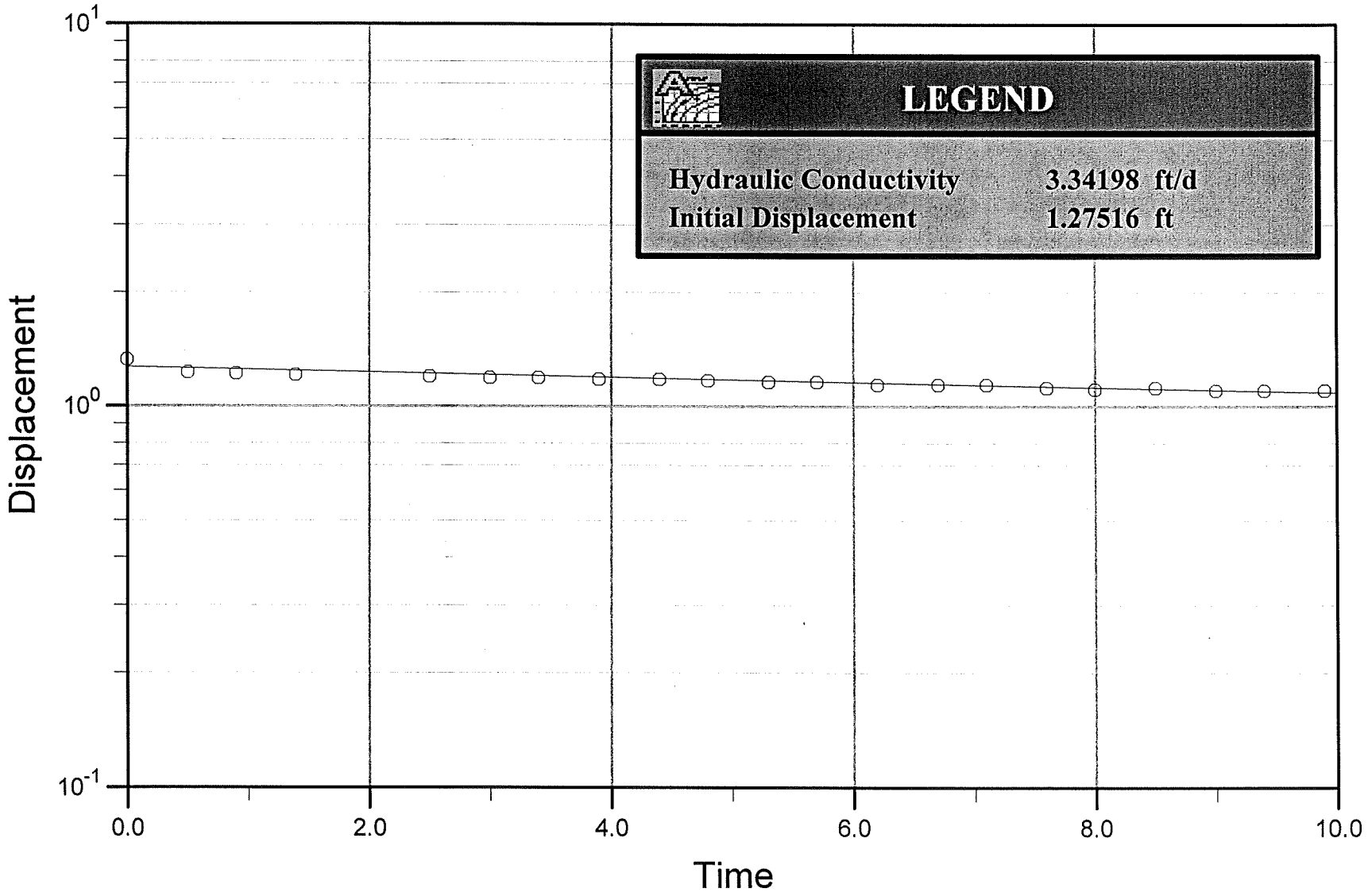
Bower and Rice Analysis of Slug Test in MW-13P



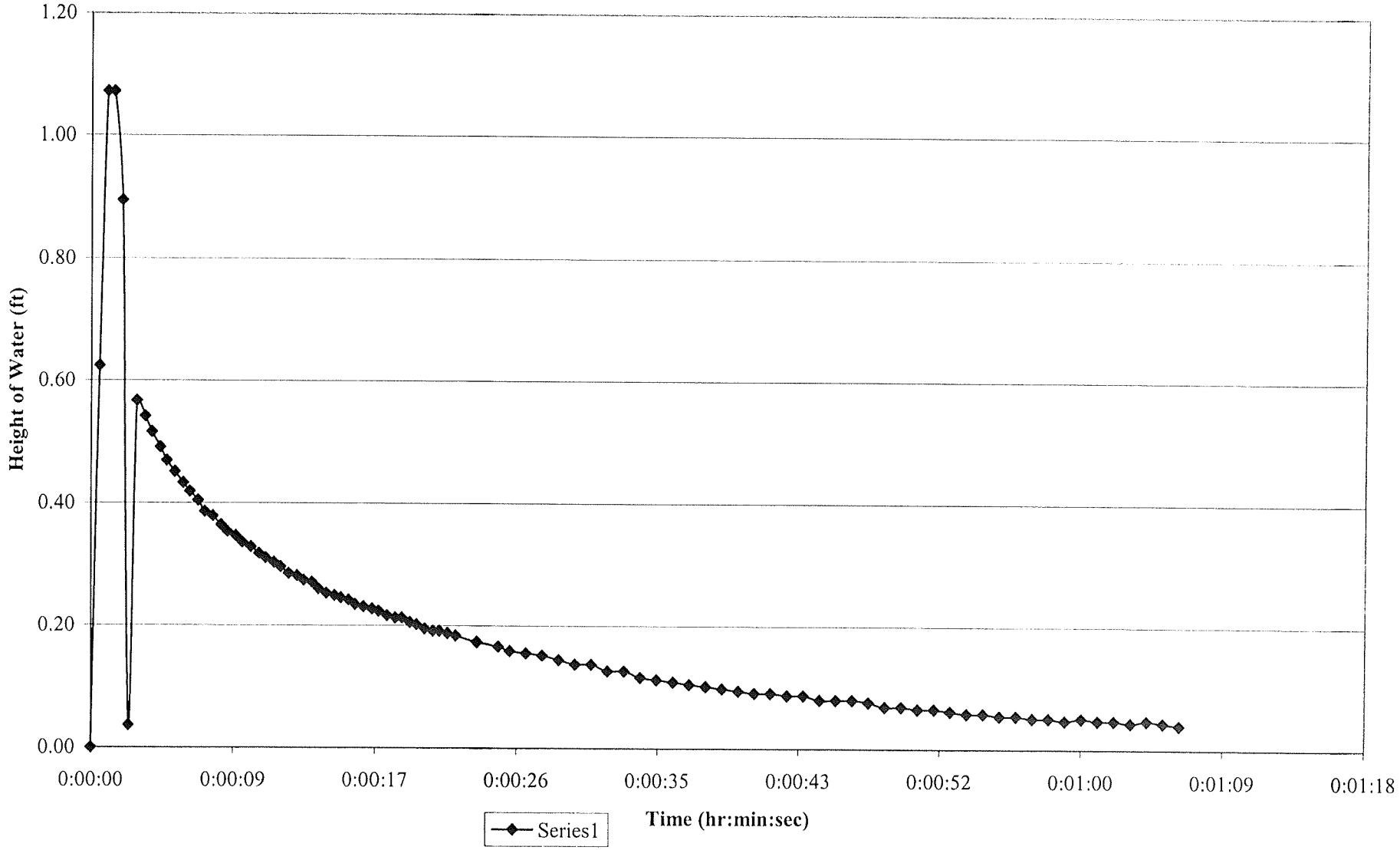
Bower and Rice Analysis of Slug Test in MW-14



Bower and Rice Analysis of Slug Test in MW-14Z



Vernon Co. MW-1PR Slug In



08/25/2003

946W1PRA.xls MW1PRa graph

Date	Time	MW1PR Slug In Analog#01 mw1rz..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	11:52:30	7.00E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
07/15/98	11:52:30	7.62E+00	0:00:00	0.62	0.5	0.62	0.0	0.00	-0.204537
07/15/98	11:52:31	8.07E+00	0:00:01	1.07	1.0	1.07	0.0	0.00	0.0301948
07/15/98	11:52:31	8.07E+00	0:00:01	1.07	1.4	1.07	0.0	0.00	0.0301948
07/15/98	11:52:32	7.89E+00	0:00:02	0.90	1.9	0.90	0.0	0.00	-0.048128
07/15/98	11:52:32	7.03E+00	0:00:02	0.04	2.3	0.04	0.0	0.00	-1.442493
07/15/98	11:52:33	7.56E+00	0:00:03	0.57	2.8	0.57	0.0	0.00	-0.246723
07/15/98	11:52:33	7.54E+00	0:00:03	0.54	3.3	0.54	0.0	0.00	-0.266482
07/15/98	11:52:34	7.51E+00	0:00:04	0.52	3.7	0.52	0.0	0.00	-0.287266
07/15/98	11:52:34	7.49E+00	0:00:04	0.49	4.2	0.49	0.0	0.00	-0.309095
07/15/98	11:52:34	7.46E+00	0:00:05	0.47	4.6	0.47	0.0	0.00	-0.328642
07/15/98	11:52:35	7.45E+00	0:00:05	0.45	5.1	0.45	0.0	0.00	-0.345727
07/15/98	11:52:35	7.43E+00	0:00:06	0.43	5.6	0.43	0.0	0.00	-0.363412
07/15/98	11:52:36	7.41E+00	0:00:06	0.42	6.0	0.42	0.0	0.00	-0.378097
07/15/98	11:52:36	7.40E+00	0:00:06	0.40	6.5	0.40	0.0	0.00	-0.393404
07/15/98	11:52:37	7.38E+00	0:00:07	0.39	6.9	0.39	0.0	0.00	-0.413188
07/15/98	11:52:37	7.37E+00	0:00:07	0.38	7.4	0.38	0.0	0.00	-0.421361
07/15/98	11:52:38	7.36E+00	0:00:08	0.36	7.9	0.36	0.0	0.00	-0.438302
07/15/98	11:52:38	7.35E+00	0:00:08	0.35	8.3	0.35	0.0	0.00	-0.451365
07/15/98	11:52:39	7.34E+00	0:00:09	0.35	8.8	0.35	0.0	0.00	-0.460297
07/15/98	11:52:39	7.33E+00	0:00:09	0.34	9.2	0.34	0.0	0.00	-0.474178
07/15/98	11:52:40	7.32E+00	0:00:10	0.33	9.7	0.33	0.0	0.00	-0.483597
07/15/98	11:52:40	7.31E+00	0:00:10	0.32	10.2	0.32	0.0	0.00	-0.49812
07/15/98	11:52:40	7.31E+00	0:00:11	0.31	10.6	0.31	0.0	0.00	-0.508078
07/15/98	11:52:41	7.30E+00	0:00:11	0.30	11.1	0.30	0.0	0.00	-0.518271
07/15/98	11:52:41	7.29E+00	0:00:12	0.30	11.5	0.30	0.0	0.00	-0.528855
07/15/98	**11:52:42**	**7.28E+00**	**0:00:12**	**0.29**	**12.0**	**0.29**	**0.0**	**0.00**	**-0.545003**
07/15/98	11:52:42	7.28E+00	0:00:13	0.28	12.5	0.28	0.0	0.00	-0.550522
07/15/98	11:52:43	7.27E+00	0:00:13	0.27	12.9	0.27	0.0	0.00	-0.561774
07/15/98	11:52:43	7.27E+00	0:00:13	0.27	13.4	0.27	0.0	0.00	-0.567512
07/15/98	11:52:44	7.25E+00	0:00:14	0.26	13.8	0.26	0.0	0.00	-0.585361
07/15/98	11:52:44	7.25E+00	0:00:14	0.25	14.3	0.25	0.0	0.00	-0.597567
07/15/98	11:52:45	7.24E+00	0:00:15	0.25	14.8	0.25	0.0	0.00	-0.603801
07/15/98	11:52:45	7.24E+00	0:00:15	0.25	15.2	0.25	0.0	0.00	-0.610125
07/15/98	11:52:46	7.24E+00	0:00:16	0.24	15.7	0.24	0.0	0.00	-0.616544
07/15/98	11:52:46	7.23E+00	0:00:16	0.23	16.1	0.23	0.0	0.00	-0.629672
07/15/98	11:52:46	7.23E+00	0:00:17	0.23	16.6	0.23	0.0	0.00	-0.636388
07/15/98	11:52:47	7.22E+00	0:00:17	0.23	17.1	0.23	0.0	0.00	-0.64321
07/15/98	11:52:47	7.22E+00	0:00:18	0.22	17.5	0.22	0.0	0.00	-0.65014
07/15/98	11:52:48	7.21E+00	0:00:18	0.22	18.0	0.22	0.0	0.00	-0.664542
07/15/98	11:52:48	7.21E+00	0:00:19	0.21	18.5	0.21	0.0	0.00	-0.671824
07/15/98	11:52:49	7.21E+00	0:00:19	0.21	18.9	0.21	0.0	0.00	-0.671824

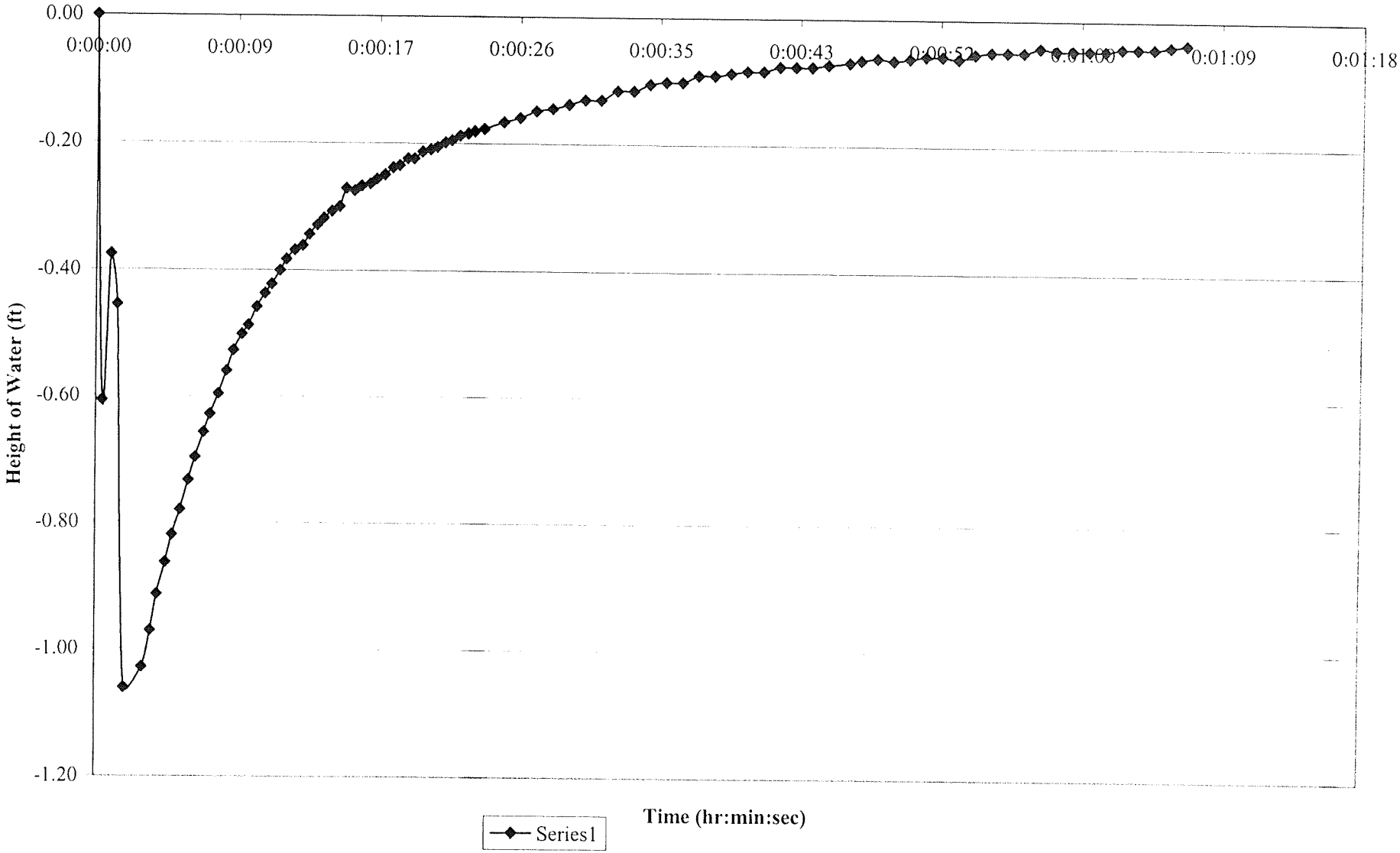
Page # 1 Terra8 Dat File --> C:\TMP\946W1PRA

Date	Time	MW1PR Slug In Analog#01 mw1rz..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	11:52:49	7.20E+00	0:00:19	0.21	19.4	0.21	0.0	0.00	-0.686766
07/15/98	11:52:50	7.20E+00	0:00:20	0.20	19.8	0.20	0.0	0.00	-0.694434
07/15/98	11:52:50	7.19E+00	0:00:20	0.19	20.3	0.19	0.0	0.00	-0.710188
07/15/98	11:52:51	7.19E+00	0:00:21	0.19	20.8	0.19	0.0	0.00	-0.718285
07/15/98	11:52:51	7.19E+00	0:00:21	0.19	21.2	0.19	0.0	0.00	-0.718285
07/15/98	11:52:52	7.18E+00	0:00:22	0.19	21.7	0.19	0.0	0.00	-0.726536
07/15/98	11:52:52	7.18E+00	0:00:22	0.18	22.2	0.18	0.0	0.00	-0.735182
07/15/98	11:52:53	7.17E+00	0:00:23	0.17	23.5	0.17	0.0	0.00	-0.761452
07/15/98	11:52:55	7.16E+00	0:00:25	0.17	24.8	0.17	0.0	0.00	-0.779892
07/15/98	11:52:55	7.15E+00	0:00:25	0.16	25.5	0.16	0.0	0.00	-0.79915
07/15/98	11:52:56	7.15E+00	0:00:27	0.16	26.5	0.16	0.0	0.00	-0.809108
07/15/98	11:52:57	7.15E+00	0:00:27	0.15	27.5	0.15	0.0	0.00	-0.819301
07/15/98	11:52:58	7.14E+00	0:00:28	0.14	28.5	0.14	0.0	0.00	-0.840734
07/15/98	11:52:59	7.13E+00	0:00:29	0.14	29.5	0.14	0.0	0.00	-0.862963
07/15/98	11:53:00	7.13E+00	0:00:31	0.14	30.5	0.14	0.0	0.00	-0.862963
07/15/98	11:53:01	7.12E+00	0:00:32	0.13	31.5	0.13	0.0	0.00	-0.898597
07/15/98	11:53:02	7.12E+00	0:00:33	0.13	32.5	0.13	0.0	0.00	-0.898597
07/15/98	11:53:03	7.11E+00	0:00:33	0.12	33.5	0.12	0.0	0.00	-0.937418
07/15/98	11:53:04	7.11E+00	0:00:35	0.11	34.5	0.11	0.0	0.00	-0.95117
07/15/98	11:53:05	7.10E+00	0:00:35	0.11	35.5	0.11	0.0	0.00	-0.965372
07/15/98	11:53:06	7.10E+00	0:00:37	0.10	36.5	0.10	0.0	0.00	-0.980468
07/15/98	11:53:07	7.10E+00	0:00:38	0.10	37.5	0.10	0.0	0.00	-0.995679
07/15/98	11:53:08	7.09E+00	0:00:39	0.10	38.5	0.10	0.0	0.00	-1.011441
07/15/98	11:53:09	7.09E+00	0:00:39	0.09	39.5	0.09	0.0	0.00	-1.027797
07/15/98	11:53:10	7.09E+00	0:00:40	0.09	40.5	0.09	0.0	0.00	-1.044793
07/15/98	11:53:11	7.09E+00	0:00:41	0.09	41.5	0.09	0.0	0.00	-1.044793
07/15/98	11:53:12	7.08E+00	0:00:42	0.09	42.5	0.09	0.0	0.00	-1.062482
07/15/98	11:53:13	7.08E+00	0:00:44	0.09	43.5	0.09	0.0	0.00	-1.062482
07/15/98	11:53:14	7.07E+00	0:00:44	0.08	44.5	0.08	0.0	0.00	-1.100179
07/15/98	11:53:15	7.07E+00	0:00:46	0.08	45.5	0.08	0.0	0.00	-1.100179
07/15/98	11:53:16	7.07E+00	0:00:46	0.08	46.5	0.08	0.0	0.00	-1.100179
07/15/98	11:53:17	7.07E+00	0:00:47	0.08	47.5	0.08	0.0	0.00	-1.120331
07/15/98	11:53:18	7.06E+00	0:00:48	0.07	48.5	0.07	0.0	0.00	-1.164309
07/15/98	11:53:19	7.06E+00	0:00:50	0.07	49.5	0.07	0.0	0.00	-1.164309
07/15/98	11:53:20	7.06E+00	0:00:50	0.06	50.5	0.06	0.0	0.00	-1.187755
07/15/98	11:53:21	7.06E+00	0:00:52	0.06	51.5	0.06	0.0	0.00	-1.187755
07/15/98	11:53:22	7.06E+00	0:00:52	0.06	52.5	0.06	0.0	0.00	-1.21254
07/15/98	11:53:23	7.05E+00	0:00:54	0.06	53.5	0.06	0.0	0.00	-1.238824
07/15/98	11:53:24	7.05E+00	0:00:54	0.06	54.5	0.06	0.0	0.00	-1.238824
07/15/98	11:53:25	7.05E+00	0:00:56	0.05	55.5	0.05	0.0	0.00	-1.266803
07/15/98	11:53:26	7.05E+00	0:00:57	0.05	56.5	0.05	0.0	0.00	-1.266803
07/15/98	11:53:27	7.05E+00	0:00:58	0.05	57.5	0.05	0.0	0.00	-1.296709

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Date	Time	MW1PR Slug In Analog#01 mw1rz..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	11:53:28	7.05E+00	0:00:58	0.05	58.5	0.05	0.0	0.00	-1.296709
07/15/98	11:53:29	7.04E+00	0:01:00	0.05	59.5	0.05	0.0	0.00	-1.328827
07/15/98	11:53:30	7.05E+00	0:01:00	0.05	60.5	0.05	0.0	0.00	-1.296709
07/15/98	11:53:31	7.04E+00	0:01:01	0.05	61.5	0.05	0.0	0.00	-1.328827
07/15/98	11:53:32	7.04E+00	0:01:03	0.05	62.5	0.05	0.0	0.00	-1.328827
07/15/98	11:53:33	7.04E+00	0:01:03	0.04	63.5	0.04	0.0	0.00	-1.363512
07/15/98	11:53:34	7.04E+00	0:01:05	0.05	64.5	0.05	0.0	0.00	-1.328827
07/15/98	11:53:35	7.04E+00	0:01:05	0.04	65.5	0.04	0.0	0.00	-1.363512
07/15/98	11:53:36	7.03E+00	0:01:06	0.04	66.5	0.04	0.0	0.00	-1.401209

Vernon Co. MW-1PR Slug Out



08/25/2003

946W1PRB.xls MW1PRb graph

MW-1PR Slug Out

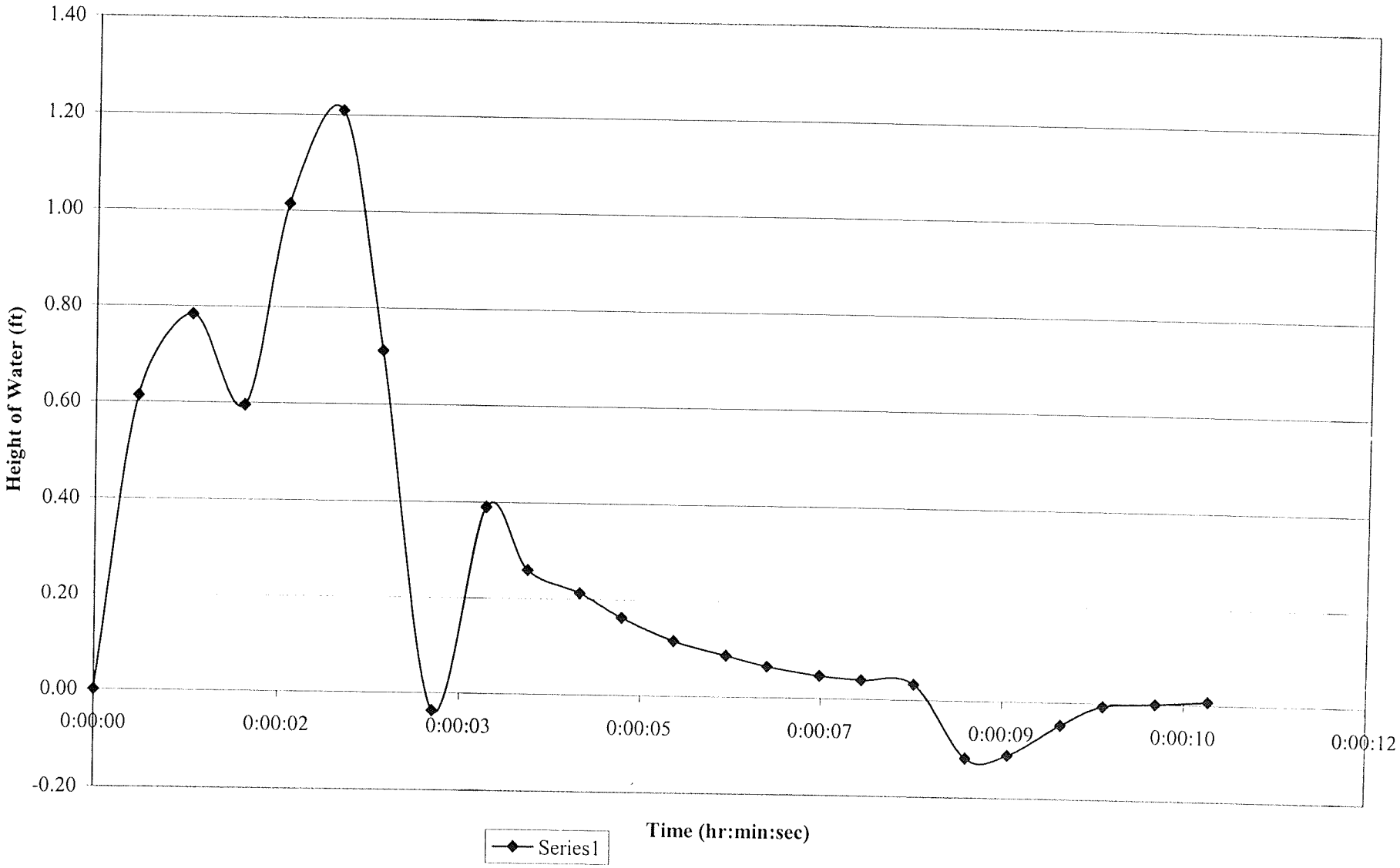
Date	Time	Analog#01 mw1pr..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	12:02:11	7.00E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
07/15/98	12:02:12	6.40E+00	0:00:00	-0.61	0.4	0.61	0.0	0.00	-0.217241
07/15/98	12:02:12	6.63E+00	0:00:01	-0.38	0.9	0.38	0.0	0.00	-0.425506
07/15/98	12:02:13	6.55E+00	0:00:01	-0.45	1.3	0.45	0.0	0.00	-0.34218
07/15/98	12:02:13	5.94E+00	0:00:02	-1.06	1.8	1.06	0.0	0.00	0.0257972
07/15/98	12:02:14	5.97E+00	0:00:03	-1.03	2.9	1.03	0.0	0.00	0.0122887
07/15/98	12:02:15	6.03E+00	0:00:03	-0.97	3.4	0.97	0.0	0.00	-0.012825
07/15/98	12:02:15	6.09E+00	0:00:04	-0.91	3.8	0.91	0.0	0.00	-0.039434
07/15/98	12:02:16	6.14E+00	0:00:04	-0.86	4.3	0.86	0.0	0.00	-0.06414
07/15/98	12:02:16	6.18E+00	0:00:05	-0.82	4.7	0.82	0.0	0.00	-0.086557
07/15/98	12:02:17	6.22E+00	0:00:05	-0.78	5.2	0.78	0.0	0.00	-0.108128
07/15/98	12:02:17	6.27E+00	0:00:06	-0.73	5.7	0.73	0.0	0.00	-0.135074
07/15/98	12:02:18	6.31E+00	0:00:06	-0.70	6.1	0.70	0.0	0.00	-0.157017
07/15/98	12:02:18	6.35E+00	0:00:07	-0.66	6.6	0.66	0.0	0.00	-0.182501
07/15/98	12:02:18	6.37E+00	0:00:07	-0.63	7.0	0.63	0.0	0.00	-0.20204
07/15/98	12:02:19	6.41E+00	0:00:08	-0.60	7.5	0.60	0.0	0.00	-0.225045
07/15/98	12:02:19	6.44E+00	0:00:08	-0.56	8.0	0.56	0.0	0.00	-0.2522
07/15/98	12:02:20	6.48E+00	0:00:08	-0.53	8.4	0.53	0.0	0.00	-0.278189
07/15/98	12:02:20	6.50E+00	0:00:09	-0.50	8.9	0.50	0.0	0.00	-0.299556
07/15/98	12:02:21	6.51E+00	0:00:09	-0.49	9.3	0.49	0.0	0.00	-0.312204
07/15/98	12:02:21	6.54E+00	0:00:10	-0.46	9.8	0.46	0.0	0.00	-0.338755
07/15/98	12:02:22	6.57E+00	0:00:10	-0.44	10.3	0.44	0.0	0.00	-0.359817
07/15/98	12:02:22	6.58E+00	0:00:11	-0.42	10.7	0.42	0.0	0.00	-0.374379
07/15/98	12:02:23	6.60E+00	0:00:11	-0.40	11.2	0.40	0.0	0.00	-0.397181
07/15/98	12:02:23	6.62E+00	0:00:12	-0.38	11.6	0.38	0.0	0.00	-0.417255
07/15/98	12:02:24	6.63E+00	0:00:12	-0.37	12.1	0.37	0.0	0.00	-0.433916
07/15/98	12:02:24	6.64E+00	0:00:13	-0.36	12.6	0.36	0.0	0.00	-0.442613
07/15/98	12:02:24	6.66E+00	0:00:13	-0.34	13.0	0.34	0.0	0.00	-0.464833
07/15/98	12:02:25	6.67E+00	0:00:14	-0.33	13.5	0.33	0.0	0.00	-0.483465
07/15/98	12:02:25	6.68E+00	0:00:14	-0.32	13.9	0.32	0.0	0.00	-0.49812
07/15/98	12:02:26	6.70E+00	0:00:14	-0.31	14.4	0.31	0.0	0.00	-0.513145
07/15/98	12:02:26	6.70E+00	0:00:15	-0.30	14.9	0.30	0.0	0.00	-0.523458
07/15/98	12:02:27	6.73E+00	0:00:15	-0.27	15.3	0.27	0.0	0.00	-0.567512
07/15/98	12:02:27	6.73E+00	0:00:16	-0.27	15.8	0.27	0.0	0.00	-0.561774
07/15/98	12:02:28	6.74E+00	0:00:16	-0.27	16.2	0.27	0.0	0.00	-0.573326
07/15/98	12:02:28	6.74E+00	0:00:17	-0.26	16.7	0.26	0.0	0.00	-0.579219
07/15/98	12:02:29	6.75E+00	0:00:17	-0.26	17.1	0.26	0.0	0.00	-0.591251
07/15/98	12:02:29	6.75E+00	0:00:18	-0.25	17.6	0.25	0.0	0.00	-0.603626
07/15/98	12:02:30	6.76E+00	0:00:18	-0.24	18.1	0.24	0.0	0.00	-0.623058
07/15/98	12:02:30	6.77E+00	0:00:19	-0.23	18.5	0.23	0.0	0.00	-0.629672
07/15/98	12:02:30	6.78E+00	0:00:19	-0.22	19.0	0.22	0.0	0.00	-0.65014
07/15/98	12:02:31	6.78E+00	0:00:19	-0.22	19.4	0.22	0.0	0.00	-0.65014
07/15/98	12:02:31	6.79E+00	0:00:20	-0.21	19.9	0.21	0.0	0.00	-0.67162
07/15/98	12:02:32	6.79E+00	0:00:20	-0.21	20.4	0.21	0.0	0.00	-0.679023
07/15/98	12:02:32	6.80E+00	0:00:21	-0.21	20.8	0.21	0.0	0.00	-0.686766
07/15/98	12:02:33	6.80E+00	0:00:21	-0.20	21.3	0.20	0.0	0.00	-0.702239
07/15/98	12:02:33	6.81E+00	0:00:22	-0.19	21.7	0.19	0.0	0.00	-0.710188
07/15/98	12:02:34	6.81E+00	0:00:22	-0.19	22.2	0.19	0.0	0.00	-0.726536
07/15/98	12:02:34	6.82E+00	0:00:23	-0.18	22.7	0.18	0.0	0.00	-0.734946
07/15/98	12:02:34	6.82E+00	0:00:23	-0.18	23.1	0.18	0.0	0.00	-0.743523
07/15/98	12:02:35	6.83E+00	0:00:24	-0.18	23.7	0.18	0.0	0.00	-0.752272
07/15/98	12:02:36	6.84E+00	0:00:25	-0.17	24.9	0.17	0.0	0.00	-0.779892
07/15/98	12:02:37	6.84E+00	0:00:26	-0.16	25.9	0.16	0.0	0.00	-0.79915
07/15/98	12:02:38	6.85E+00	0:00:27	-0.15	26.9	0.15	0.0	0.00	-0.829738

 Terra8 Data File --> C:\TMP\946W1PRB

MW-1PR Slug Out

Date	Time	Analog#01 mw1pr..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	12:02:39	6.86E+00	0:00:28	-0.14	27.9	0.14	0.0	0.00	-0.840433
07/15/98	12:02:40	6.87E+00	0:00:29	-0.14	28.9	0.14	0.0	0.00	-0.862646
07/15/98	12:02:41	6.87E+00	0:00:30	-0.13	29.9	0.13	0.0	0.00	-0.886391
07/15/98	12:02:42	6.87E+00	0:00:31	-0.13	30.9	0.13	0.0	0.00	-0.886391
07/15/98	12:02:43	6.89E+00	0:00:32	-0.12	31.9	0.12	0.0	0.00	-0.937418
07/15/98	12:02:44	6.89E+00	0:00:33	-0.12	32.9	0.12	0.0	0.00	-0.937418
07/15/98	12:02:45	6.90E+00	0:00:34	-0.10	33.9	0.10	0.0	0.00	-0.980053
07/15/98	12:02:46	6.90E+00	0:00:35	-0.10	34.9	0.10	0.0	0.00	-0.995249
07/15/98	12:02:47	6.90E+00	0:00:36	-0.10	35.9	0.10	0.0	0.00	-0.995249
07/15/98	12:02:48	6.91E+00	0:00:37	-0.09	36.9	0.09	0.0	0.00	-1.044793
07/15/98	12:02:49	6.91E+00	0:00:38	-0.09	37.9	0.09	0.0	0.00	-1.044793
07/15/98	12:02:50	6.92E+00	0:00:39	-0.09	38.9	0.09	0.0	0.00	-1.062482
07/15/98	12:02:51	6.92E+00	0:00:40	-0.08	39.9	0.08	0.0	0.00	-1.080922
07/15/98	12:02:52	6.92E+00	0:00:41	-0.08	40.9	0.08	0.0	0.00	-1.080922
07/15/98	12:02:53	6.93E+00	0:00:42	-0.08	41.9	0.08	0.0	0.00	-1.120331
07/15/98	12:02:54	6.93E+00	0:00:43	-0.08	42.9	0.08	0.0	0.00	-1.120331
07/15/98	12:02:55	6.93E+00	0:00:44	-0.08	43.9	0.08	0.0	0.00	-1.120331
07/15/98	12:02:56	6.93E+00	0:00:45	-0.07	44.9	0.07	0.0	0.00	-1.141463
07/15/98	12:02:58	6.93E+00	0:00:46	-0.07	46.2	0.07	0.0	0.00	-1.163676
07/15/98	12:02:58	6.94E+00	0:00:47	-0.07	46.9	0.07	0.0	0.00	-1.187087
07/15/98	12:02:59	6.94E+00	0:00:48	-0.06	47.9	0.06	0.0	0.00	-1.211832
07/15/98	12:03:00	6.94E+00	0:00:49	-0.07	48.9	0.07	0.0	0.00	-1.187087
07/15/98	12:03:01	6.94E+00	0:00:50	-0.06	49.9	0.06	0.0	0.00	-1.211832
07/15/98	12:03:02	6.94E+00	0:00:51	-0.06	50.9	0.06	0.0	0.00	-1.238072
07/15/98	12:03:03	6.94E+00	0:00:52	-0.06	51.9	0.06	0.0	0.00	-1.238072
07/15/98	12:03:04	6.94E+00	0:00:53	-0.06	52.9	0.06	0.0	0.00	-1.211832
07/15/98	12:03:05	6.95E+00	0:00:54	-0.05	53.9	0.05	0.0	0.00	-1.266001
07/15/98	12:03:06	6.95E+00	0:00:55	-0.05	54.9	0.05	0.0	0.00	-1.296709
07/15/98	12:03:07	6.95E+00	0:00:56	-0.05	55.9	0.05	0.0	0.00	-1.296709
07/15/98	12:03:08	6.95E+00	0:00:57	-0.05	56.9	0.05	0.0	0.00	-1.296709
07/15/98	12:03:09	6.96E+00	0:00:58	-0.04	57.9	0.04	0.0	0.00	-1.363512
07/15/98	12:03:10	6.96E+00	0:00:59	-0.05	58.9	0.05	0.0	0.00	-1.328827
07/15/98	12:03:11	6.96E+00	0:01:00	-0.05	59.9	0.05	0.0	0.00	-1.328827
07/15/98	12:03:12	6.96E+00	0:01:01	-0.05	60.9	0.05	0.0	0.00	-1.328827
07/15/98	12:03:13	6.96E+00	0:01:02	-0.05	61.9	0.05	0.0	0.00	-1.328827
07/15/98	12:03:14	6.96E+00	0:01:03	-0.04	62.9	0.04	0.0	0.00	-1.363512
07/15/98	12:03:15	6.96E+00	0:01:04	-0.04	63.9	0.04	0.0	0.00	-1.363512
07/15/98	12:03:16	6.96E+00	0:01:05	-0.04	64.9	0.04	0.0	0.00	-1.363512
07/15/98	12:03:17	6.96E+00	0:01:06	-0.04	65.9	0.04	0.0	0.00	-1.401209
07/15/98	12:03:18	6.97E+00	0:01:07	-0.04	66.9	0.04	0.0	0.00	-1.442493

Vernon Co. MW-1RZ Slug In



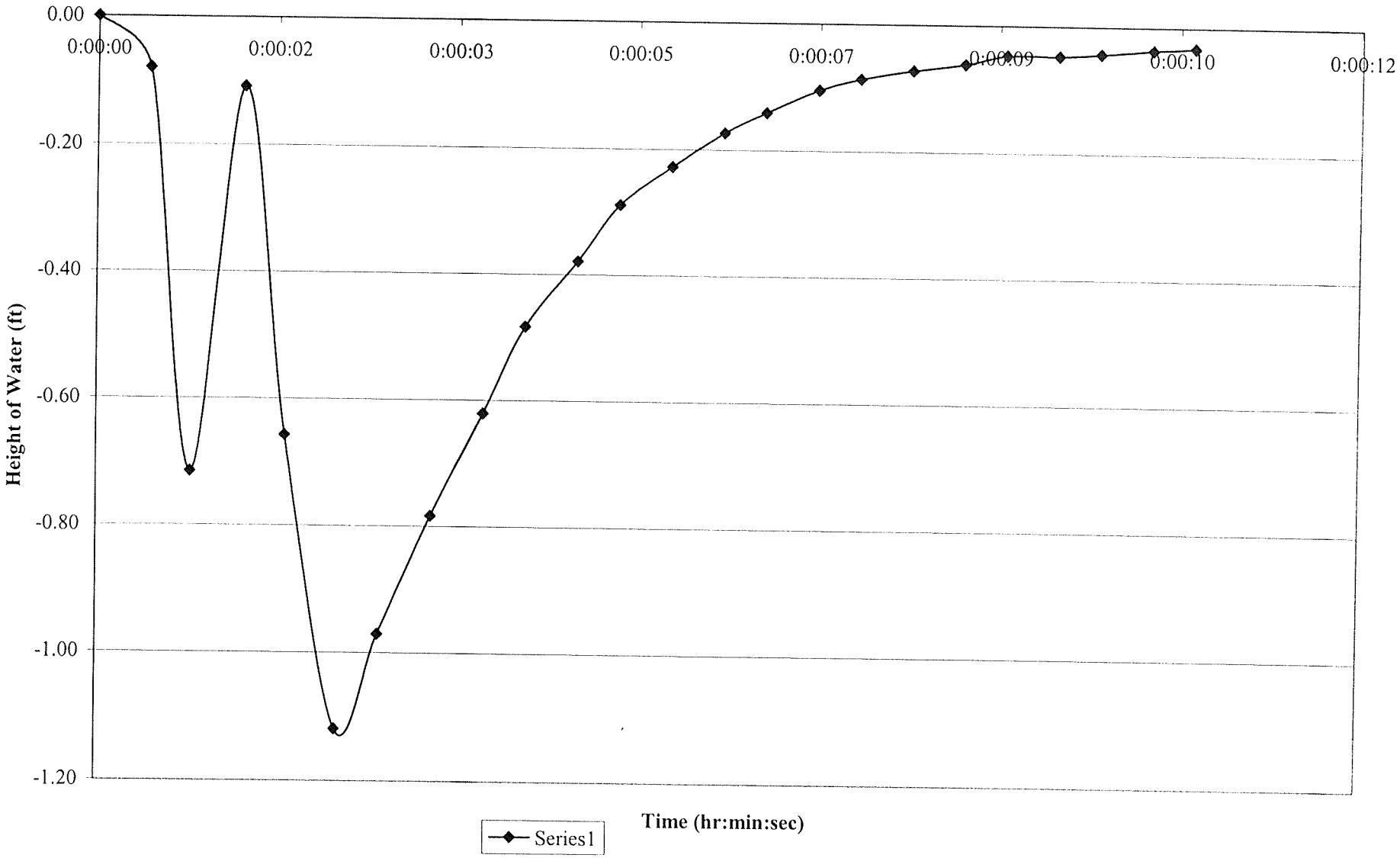
08/25/2003

946W1RZA.xls MW1RZa graph

MW-1RZ Slug In

Date	Time	Analog#01 mw1rz..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	10:57:22	7.09E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
07/15/98	10:57:22	7.70E+00	0:00:00	0.61	0.4	0.61	0.0	0.00	-0.212115
07/15/98	10:57:23	7.87E+00	0:00:01	0.78	0.9	0.78	0.0	0.00	-0.106127
07/15/98	10:57:23	7.68E+00	0:00:01	0.60	1.4	0.60	0.0	0.00	-0.225045
07/15/98	10:57:24	8.10E+00	0:00:02	1.01	1.8	1.01	0.0	0.00	0.006124
07/15/98	10:57:24	8.30E+00	0:00:02	1.21	2.3	1.21	0.0	0.00	0.082498
07/15/98	10:57:25	7.80E+00	0:00:03	0.71	2.7	0.71	0.0	0.00	-0.148069
07/15/98	10:57:25	7.05E+00	0:00:03	-0.04	3.2	0.04	0.0	0.00	-1.442493
07/15/98	10:57:26	7.48E+00	0:00:04	0.39	3.7	0.39	0.0	0.00	-0.409158
07/15/98	10:57:26	7.35E+00	0:00:04	0.26	4.1	0.26	0.0	0.00	-0.585194
07/15/98	10:57:27	7.30E+00	0:00:05	0.21	4.6	0.21	0.0	0.00	-0.67162
07/15/98	10:57:27	7.25E+00	0:00:05	0.16	5.0	0.16	0.0	0.00	-0.789414
07/15/98	10:57:27	7.20E+00	0:00:05	0.12	5.5	0.12	0.0	0.00	-0.937418
07/15/98	10:57:28	7.18E+00	0:00:06	0.09	6.0	0.09	0.0	0.00	-1.062482
07/15/98	10:57:28	7.15E+00	0:00:06	0.07	6.4	0.07	0.0	0.00	-1.187087
07/15/98	10:57:29	7.14E+00	0:00:07	0.05	6.9	0.05	0.0	0.00	-1.328827
07/15/98	10:57:29	7.13E+00	0:00:07	0.04	7.3	0.04	0.0	0.00	-1.401209
07/15/98	10:57:30	7.12E+00	0:00:08	0.03	7.8	0.03	0.0	0.00	-1.488117
07/15/98	10:57:30	6.97E+00	0:00:08	-0.12	8.3	0.12	0.0	0.00	-0.924088
07/15/98	10:57:31	6.98E+00	0:00:09	-0.11	8.7	0.11	0.0	0.00	-0.95117
07/15/98	10:57:31	7.04E+00	0:00:09	-0.05	9.2	0.05	0.0	0.00	-1.328827
07/15/98	10:57:31	7.08E+00	0:00:10	-0.01	9.6	0.01	0.0	0.00	-2.142668
07/15/98	10:57:32	7.09E+00	0:00:10	0.00	10.1	0.00	0.0	0.00	#NUM!
07/15/98	10:57:32	7.10E+00	0:00:11	0.01	10.6	0.01	0.0	0.00	-2.142668

Vernon Co. MW-1RZ Slug Out



08/25/2003

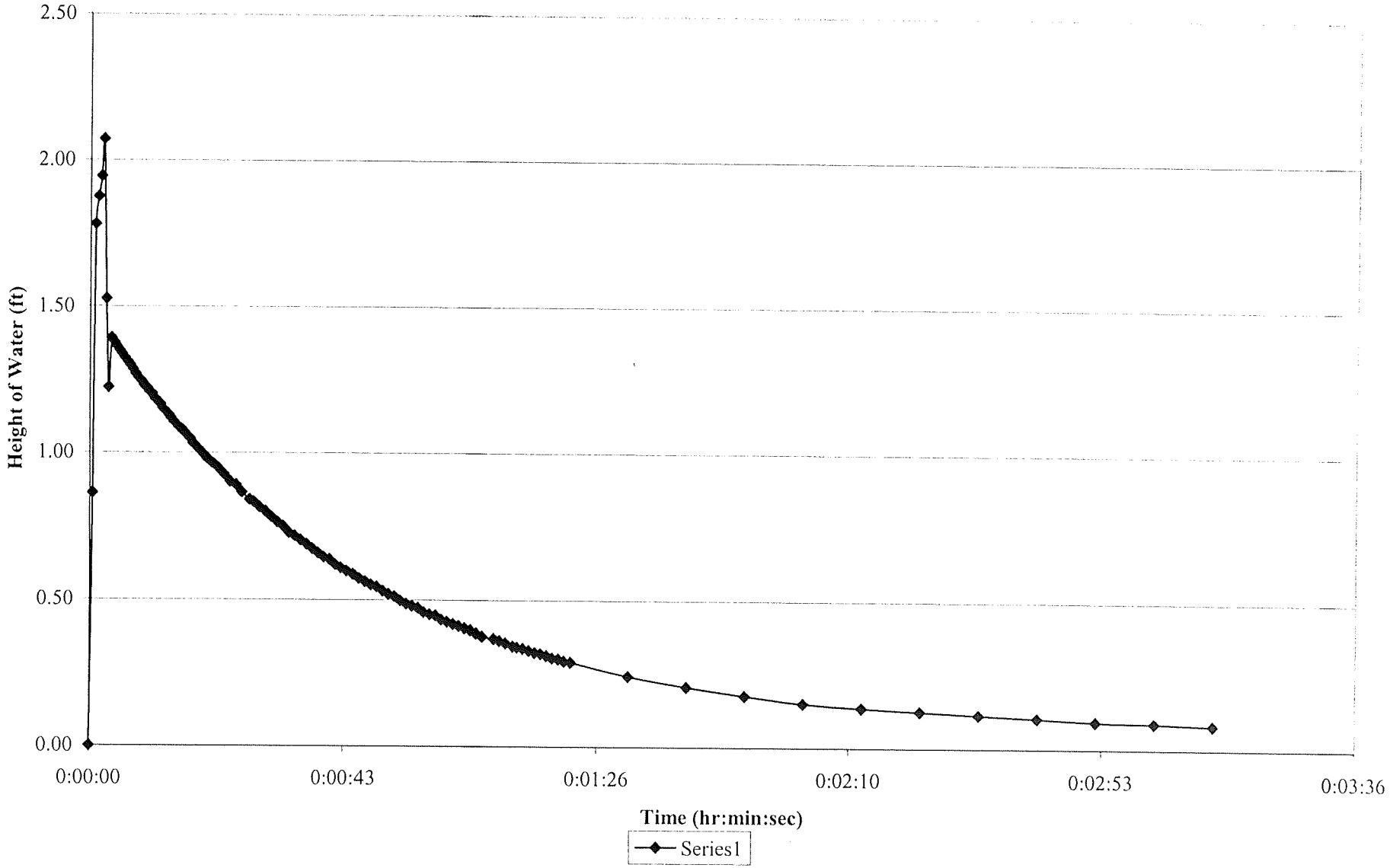
946W1RZB.xls MW1RZb graph

 Terra8 Data File --> C:\TMP\946W1RZB

MW-1RZ Slug Out

Date	Time	Analog#01 mw1rz..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	11:03:30	7.09E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
07/15/98	11:03:31	7.01E+00	0:00:01	-0.08	0.5	0.08	0.0	0.00	-1.100179
07/15/98	11:03:31	6.38E+00	0:00:01	-0.71	0.9	0.71	0.0	0.00	-0.145937
07/15/98	11:03:32	6.98E+00	0:00:01	-0.11	1.4	0.11	0.0	0.00	-0.965372
07/15/98	11:03:32	6.44E+00	0:00:02	-0.66	1.8	0.66	0.0	0.00	-0.182501
07/15/98	11:03:33	5.97E+00	0:00:02	-1.12	2.3	1.12	0.0	0.00	0.048791
07/15/98	11:03:33	6.12E+00	0:00:03	-0.97	2.7	0.97	0.0	0.00	-0.012825
07/15/98	11:03:34	6.31E+00	0:00:03	-0.78	3.2	0.78	0.0	0.00	-0.106127
07/15/98	11:03:34	6.47E+00	0:00:04	-0.62	3.7	0.62	0.0	0.00	-0.207048
07/15/98	11:03:35	6.61E+00	0:00:04	-0.48	4.1	0.48	0.0	0.00	-0.315514
07/15/98	11:03:35	6.71E+00	0:00:05	-0.38	4.6	0.38	0.0	0.00	-0.421361
07/15/98	11:03:35	6.80E+00	0:00:05	-0.29	5.0	0.29	0.0	0.00	-0.539553
07/15/98	11:03:36	6.87E+00	0:00:06	-0.23	5.5	0.23	0.0	0.00	-0.64321
07/15/98	11:03:36	6.92E+00	0:00:06	-0.17	6.0	0.17	0.0	0.00	-0.761452
07/15/98	11:03:37	6.95E+00	0:00:06	-0.14	6.4	0.14	0.0	0.00	-0.851706
07/15/98	11:03:37	6.99E+00	0:00:07	-0.10	6.9	0.10	0.0	0.00	-0.980468
07/15/98	11:03:38	7.01E+00	0:00:07	-0.09	7.3	0.09	0.0	0.00	-1.062482
07/15/98	11:03:38	7.02E+00	0:00:08	-0.07	7.8	0.07	0.0	0.00	-1.141463
07/15/98	11:03:39	7.03E+00	0:00:08	-0.06	8.3	0.06	0.0	0.00	-1.21254
07/15/98	11:03:39	7.05E+00	0:00:09	-0.05	8.7	0.05	0.0	0.00	-1.328827
07/15/98	11:03:40	7.05E+00	0:00:09	-0.05	9.2	0.05	0.0	0.00	-1.328827
07/15/98	11:03:40	7.05E+00	0:00:10	-0.04	9.6	0.04	0.0	0.00	-1.363512
07/15/98	11:03:40	7.06E+00	0:00:10	-0.04	10.1	0.04	0.0	0.00	-1.442493
07/15/98	11:03:41	7.06E+00	0:00:11	-0.03	10.5	0.03	0.0	0.00	-1.488117

Vernon Co. MW-3 Slug In



06/16/2003

0946W3A.xls MW3a graph

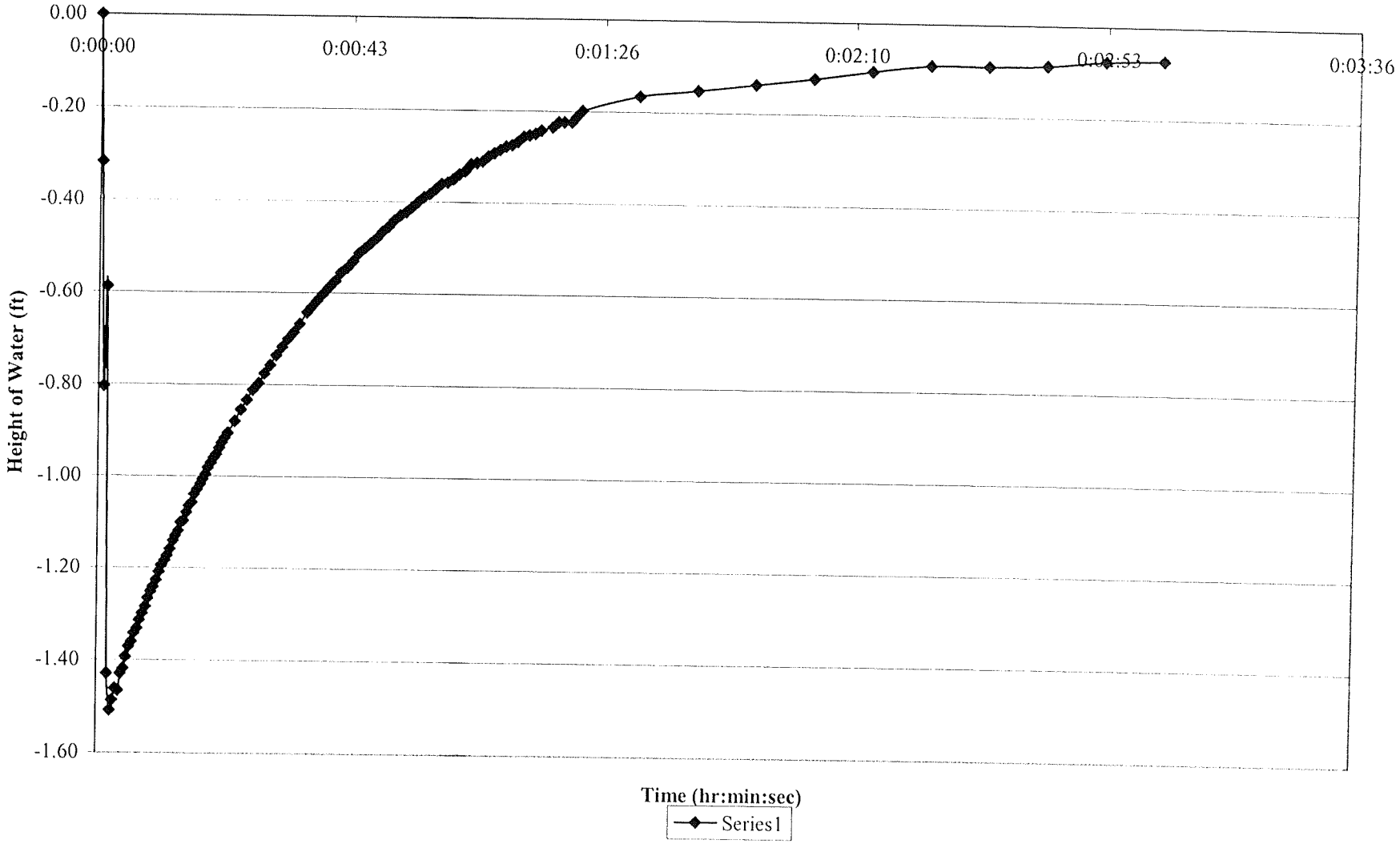
Terra8 Data File --> C:\TMP\0946W3A

Time	MW-3 Slug In Analog#01 mw-3..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:09:00	7.30E+00	0:00:00	0.00	0.0	0.00	0.0	0.0	#NUM!
13:09:01	8.16E+00	0:00:00	0.86	0.5	0.86	0.0	0.0	-0.064190546
13:09:01	9.08E+00	0:00:01	1.78	0.9	1.78	0.0	0.0	0.251151343
13:09:02	9.18E+00	0:00:01	1.88	1.4	1.88	0.0	0.0	0.273417995
13:09:02	9.25E+00	0:00:02	1.95	1.9	1.95	0.0	0.0	0.289008912
13:09:03	9.37E+00	0:00:02	2.07	2.3	2.07	0.0	0.0	0.316326866
13:09:03	8.83E+00	0:00:03	1.53	2.8	1.53	0.0	0.0	0.183753706
13:09:04	8.53E+00	0:00:03	1.22	3.2	1.22	0.0	0.0	0.087603974
13:09:04	8.70E+00	0:00:04	1.39	3.7	1.39	0.0	0.0	0.144013466
13:09:05	8.68E+00	0:00:04	1.38	4.2	1.38	0.0	0.0	0.139469776
13:09:05	8.67E+00	0:00:05	1.36	4.6	1.36	0.0	0.0	0.134909879
13:09:06	8.65E+00	0:00:05	1.35	5.1	1.35	0.0	0.0	0.130301597
13:09:06	8.64E+00	0:00:06	1.34	5.5	1.34	0.0	0.0	0.126780577
13:09:06	8.63E+00	0:00:06	1.32	6.0	1.32	0.0	0.0	0.122084751
13:09:07	8.61E+00	0:00:06	1.31	6.5	1.31	0.0	0.0	0.117337595
13:09:07	8.60E+00	0:00:07	1.30	6.9	1.30	0.0	0.0	0.113709438
13:09:08	8.59E+00	0:00:07	1.28	7.4	1.28	0.0	0.0	0.108869329
13:09:08	8.57E+00	0:00:08	1.27	7.8	1.27	0.0	0.0	0.103974669
13:09:09	8.56E+00	0:00:08	1.26	8.3	1.26	0.0	0.0	0.098989639
13:09:09	8.55E+00	0:00:09	1.25	8.8	1.25	0.0	0.0	0.095239112
13:09:10	8.53E+00	0:00:09	1.23	9.2	1.23	0.0	0.0	0.090187488
13:09:10	8.53E+00	0:00:10	1.22	9.7	1.22	0.0	0.0	0.087603974
13:09:11	8.51E+00	0:00:10	1.21	10.1	1.21	0.0	0.0	0.082462221
13:09:11	8.50E+00	0:00:11	1.20	10.6	1.20	0.0	0.0	0.079868335
13:09:12	8.49E+00	0:00:11	1.18	11.1	1.18	0.0	0.0	0.073278336
13:09:12	8.48E+00	0:00:11	1.18	11.5	1.18	0.0	0.0	0.070628844
13:09:12	8.47E+00	0:00:12	1.17	12.0	1.17	0.0	0.0	0.066624051
13:09:13	8.45E+00	0:00:12	1.15	12.4	1.15	0.0	0.0	0.061226225
13:09:13	8.44E+00	0:00:13	1.14	12.9	1.14	0.0	0.0	0.05709529
13:09:14	8.43E+00	0:00:13	1.13	13.4	1.13	0.0	0.0	0.052963129
13:09:14	8.42E+00	0:00:14	1.12	13.8	1.12	0.0	0.0	0.048791274
13:09:15	8.41E+00	0:00:14	1.10	14.3	1.10	0.0	0.0	0.043126398
13:09:15	8.40E+00	0:00:15	1.10	14.7	1.10	0.0	0.0	0.040285799
13:09:16	8.39E+00	0:00:15	1.09	15.2	1.09	0.0	0.0	0.035989757
13:09:16	8.38E+00	0:00:16	1.08	15.7	1.08	0.0	0.0	0.033101937
13:09:17	8.37E+00	0:00:16	1.07	16.1	1.07	0.0	0.0	0.028693228
13:09:17	8.36E+00	0:00:17	1.06	16.6	1.06	0.0	0.0	0.024280376
13:09:18	8.35E+00	0:00:17	1.05	17.1	1.05	0.0	0.0	0.019822224
13:09:18	8.33E+00	0:00:17	1.03	17.5	1.03	0.0	0.0	0.013763855
13:09:19	8.32E+00	0:00:18	1.01	18.4	1.01	0.0	0.0	0.006123606
13:09:19	8.31E+00	0:00:19	1.00	18.9	1.00	0.0	0.0	0.001474097
13:09:20	8.29E+00	0:00:19	0.99	19.4	0.99	0.0	0.0	-0.003269485
13:09:20	8.28E+00	0:00:20	0.98	19.8	0.98	0.0	0.0	-0.008021209
13:09:21	8.28E+00	0:00:20	0.97	20.3	0.97	0.0	0.0	-0.011218157
13:09:21	8.27E+00	0:00:21	0.97	20.7	0.97	0.0	0.0	-0.014438812
13:09:22	8.26E+00	0:00:21	0.96	21.2	0.96	0.0	0.0	-0.01768353
13:09:22	8.25E+00	0:00:22	0.95	21.8	0.95	0.0	0.0	-0.02264227
13:09:23	8.23E+00	0:00:23	0.93	22.8	0.93	0.0	0.0	-0.03263926
13:09:24	8.20E+00	0:00:24	0.90	23.8	0.90	0.0	0.0	-0.044649043
13:09:25	8.19E+00	0:00:25	0.89	24.8	0.89	0.0	0.0	-0.049878652
13:09:26	8.17E+00	0:00:26	0.87	25.8	0.87	0.0	0.0	-0.062381821
13:09:28	8.14E+00	0:00:27	0.84	27.1	0.84	0.0	0.0	-0.075204004
13:09:28	8.14E+00	0:00:28	0.83	27.8	0.83	0.0	0.0	-0.078990199
13:09:29	8.12E+00	0:00:29	0.82	28.8	0.82	0.0	0.0	-0.088469538

Time	MW-3 Slug In Analog#01 mw-3..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:09:30	8.10E+00	0:00:30	0.80	29.8	0.80	0.0	0.0	-0.096259059
13:09:31	8.09E+00	0:00:31	0.78	30.8	0.78	0.0	0.0	-0.106127321
13:09:32	8.07E+00	0:00:32	0.77	31.8	0.77	0.0	0.0	-0.116225039
13:09:33	8.05E+00	0:00:33	0.75	32.8	0.75	0.0	0.0	-0.124533584
13:09:34	8.03E+00	0:00:34	0.73	33.8	0.73	0.0	0.0	-0.137212902
13:09:35	8.02E+00	0:00:35	0.72	34.8	0.72	0.0	0.0	-0.143754599
13:09:36	8.01E+00	0:00:36	0.70	35.8	0.70	0.0	0.0	-0.152550738
13:09:37	7.99E+00	0:00:37	0.69	36.8	0.69	0.0	0.0	-0.161528721
13:09:38	7.98E+00	0:00:38	0.67	37.8	0.67	0.0	0.0	-0.170760572
13:09:39	7.96E+00	0:00:39	0.66	38.8	0.66	0.0	0.0	-0.180127178
13:09:40	7.95E+00	0:00:40	0.65	39.8	0.65	0.0	0.0	-0.189767482
13:09:41	7.94E+00	0:00:41	0.64	40.8	0.64	0.0	0.0	-0.194635093
13:09:42	7.92E+00	0:00:42	0.62	41.8	0.62	0.0	0.0	-0.207048292
13:09:43	7.91E+00	0:00:43	0.61	42.8	0.61	0.0	0.0	-0.214670165
13:09:44	7.90E+00	0:00:44	0.60	43.8	0.60	0.0	0.0	-0.22250068
13:09:45	7.89E+00	0:00:45	0.59	44.8	0.59	0.0	0.0	-0.230401152
13:09:46	7.88E+00	0:00:46	0.57	45.8	0.57	0.0	0.0	-0.241163775
13:09:47	7.86E+00	0:00:47	0.56	46.8	0.56	0.0	0.0	-0.249491605
13:09:48	7.85E+00	0:00:48	0.55	47.8	0.55	0.0	0.0	-0.257903598
13:09:49	7.85E+00	0:00:49	0.55	48.8	0.55	0.0	0.0	-0.263603498
13:09:50	7.83E+00	0:00:50	0.53	49.8	0.53	0.0	0.0	-0.275314612
13:09:51	7.82E+00	0:00:51	0.52	50.8	0.52	0.0	0.0	-0.284247283
13:09:52	7.81E+00	0:00:52	0.51	51.8	0.51	0.0	0.0	-0.29030613
13:09:53	7.80E+00	0:00:53	0.50	52.8	0.50	0.0	0.0	-0.302683458
13:09:54	7.79E+00	0:00:54	0.49	53.8	0.49	0.0	0.0	-0.31229272
13:09:55	7.78E+00	0:00:55	0.48	54.8	0.48	0.0	0.0	-0.318758763
13:09:56	7.77E+00	0:00:56	0.47	55.8	0.47	0.0	0.0	-0.325322532
13:09:57	7.76E+00	0:00:57	0.46	56.8	0.46	0.0	0.0	-0.338755391
13:09:58	7.75E+00	0:00:58	0.45	57.8	0.45	0.0	0.0	-0.345727173
13:09:59	7.75E+00	0:00:59	0.45	58.8	0.45	0.0	0.0	-0.34920696
13:10:00	7.73E+00	0:01:00	0.43	59.8	0.43	0.0	0.0	-0.363411816
13:10:01	7.73E+00	0:01:01	0.43	60.8	0.43	0.0	0.0	-0.37069236
13:10:02	7.72E+00	0:01:02	0.42	61.8	0.42	0.0	0.0	-0.378097039
13:10:03	7.71E+00	0:01:03	0.41	62.8	0.41	0.0	0.0	-0.385735713
13:10:04	7.71E+00	0:01:04	0.40	63.8	0.40	0.0	0.0	-0.393403691
13:10:05	**7.70E+00**	**0:01:05**	**0.40**	**64.8**	**0.40**	**0.0**	**0.0**	**-0.401209493**
13:10:06	7.69E+00	0:01:06	0.39	65.8	0.39	0.0	0.0	-0.413187731
13:10:07	7.68E+00	0:01:07	0.38	66.8	0.38	0.0	0.0	-0.425621436
13:10:09	7.67E+00	0:01:09	0.37	68.8	0.37	0.0	0.0	-0.434034183
13:10:10	7.66E+00	0:01:10	0.36	69.8	0.36	0.0	0.0	-0.442613118
13:10:11	7.66E+00	0:01:11	0.35	70.8	0.35	0.0	0.0	-0.45136494
13:10:13	7.64E+00	0:01:12	0.34	72.1	0.34	0.0	0.0	-0.464832515
13:10:13	7.64E+00	0:01:13	0.34	72.8	0.34	0.0	0.0	-0.469544156
13:10:14	7.64E+00	0:01:14	0.34	73.8	0.34	0.0	0.0	-0.474178048
13:10:15	7.63E+00	0:01:15	0.33	74.8	0.33	0.0	0.0	-0.483596852
13:10:16	7.62E+00	0:01:16	0.32	75.8	0.32	0.0	0.0	-0.493224463
13:10:17	7.62E+00	0:01:17	0.32	76.8	0.32	0.0	0.0	-0.498119506
13:10:18	7.61E+00	0:01:18	0.31	77.8	0.31	0.0	0.0	-0.508078287
13:10:19	7.61E+00	0:01:19	0.30	78.8	0.30	0.0	0.0	-0.518270803
13:10:20	7.60E+00	0:01:20	0.30	79.8	0.30	0.0	0.0	-0.523603173
13:10:21	7.59E+00	0:01:21	0.29	80.8	0.29	0.0	0.0	-0.534171185
13:10:22	7.59E+00	0:01:22	0.29	81.9	0.29	0.0	0.0	-0.539553216
13:10:32	7.54E+00	0:01:32	0.24	91.8	0.24	0.0	0.0	-0.616543703
13:10:42	7.51E+00	0:01:42	0.21	101.8	0.21	0.0	0.0	-0.686765708
13:10:52	7.48E+00	0:01:52	0.18	111.8	0.18	0.0	0.0	-0.752517739

Time	MW-3 Slug In Analog#01 mw-3..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:11:02	7.45E+00	0:02:02	0.15	121.8	0.15	0.0	0.0	-0.819300799
13:11:12	7.44E+00	0:02:12	0.14	131.8	0.14	0.0	0.0	-0.862962545
13:11:22	7.43E+00	0:02:22	0.13	141.8	0.13	0.0	0.0	-0.898596649
13:11:32	7.42E+00	0:02:32	0.12	151.8	0.12	0.0	0.0	-0.937418016
13:11:42	7.41E+00	0:02:42	0.10	161.8	0.10	0.0	0.0	-0.980468315
13:11:52	7.40E+00	0:02:52	0.09	171.8	0.09	0.0	0.0	-1.027797162
13:12:02	7.39E+00	0:03:02	0.09	181.8	0.09	0.0	0.0	-1.044793462
13:12:12	7.38E+00	0:03:12	0.08	191.8	0.08	0.0	0.0	-1.080921908
13:12:22	7.38E+00	0:03:22	0.08	201.8	0.08	0.0	0.0	-1.080921908
13:12:32	7.38E+00	0:03:32	0.08	211.8	0.08	0.0	0.0	-1.120330794
13:12:42	7.37E+00	0:03:42	0.07	221.8	0.07	0.0	0.0	-1.141462802
13:12:52	7.37E+00	0:03:52	0.06	231.8	0.06	0.0	0.0	-1.187755303
13:13:02	7.37E+00	0:04:02	0.06	241.8	0.06	0.0	0.0	-1.187755303
13:13:12	7.36E+00	0:04:12	0.06	251.8	0.06	0.0	0.0	-1.212539525
13:13:22	7.36E+00	0:04:22	0.06	261.8	0.06	0.0	0.0	-1.212539525
13:13:32	7.36E+00	0:04:32	0.06	271.8	0.06	0.0	0.0	-1.238824187
13:13:42	7.36E+00	0:04:42	0.06	281.8	0.06	0.0	0.0	-1.238824187
13:13:52	7.36E+00	0:04:52	0.06	291.8	0.06	0.0	0.0	-1.238824187
13:14:02	7.35E+00	0:05:02	0.05	301.8	0.05	0.0	0.0	-1.296708622
13:14:12	7.35E+00	0:05:12	0.05	311.8	0.05	0.0	0.0	-1.296708622
13:14:22	7.35E+00	0:05:22	0.05	321.8	0.05	0.0	0.0	-1.328827157
13:14:32	7.35E+00	0:05:32	0.05	331.8	0.05	0.0	0.0	-1.328827157
13:14:42	7.34E+00	0:05:42	0.04	341.8	0.04	0.0	0.0	-1.401209493
13:14:52	7.35E+00	0:05:52	0.04	351.8	0.04	0.0	0.0	-1.363512104
13:15:02	7.34E+00	0:06:02	0.04	361.8	0.04	0.0	0.0	-1.401209493
13:15:12	7.34E+00	0:06:12	0.04	371.8	0.04	0.0	0.0	-1.401209493
13:15:22	7.35E+00	0:06:22	0.04	381.8	0.04	0.0	0.0	-1.363512104
13:15:32	7.35E+00	0:06:32	0.04	391.8	0.04	0.0	0.0	-1.363512104
13:15:42	7.34E+00	0:06:42	0.04	401.8	0.04	0.0	0.0	-1.401209493
13:15:52	7.35E+00	0:06:52	0.05	411.8	0.05	0.0	0.0	-1.328827157

Vernon Co. MW-3 Slug Out



06/16/2003

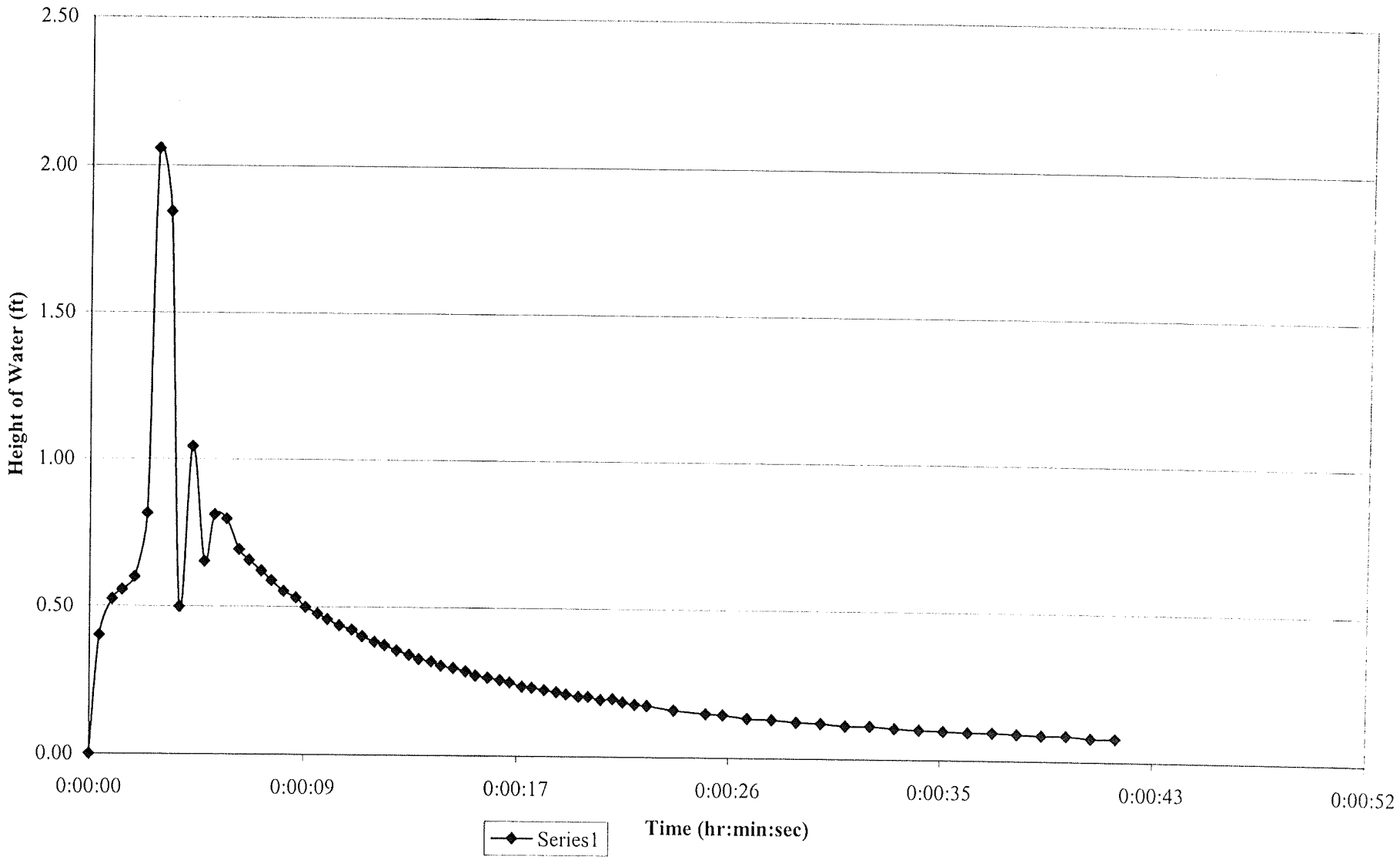
0946W3B.xls MW3b graph

Time	MW-3 Slug Out Analog#01 mw-3..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:18:58	7.33E+00	0:00:00	0.00	0.0	0.00	0.0	0.0	#NUM!
13:18:58	7.01E+00	0:00:00	-0.32	0.4	0.32	0.0	0.0	-0.498119506
13:18:59	6.53E+00	0:00:01	-0.80	0.9	0.80	0.0	0.0	-0.094312032
13:18:59	6.74E+00	0:00:01	-0.59	1.4	0.59	0.0	0.0	-0.230401152
13:19:00	5.90E+00	0:00:02	-1.43	1.8	1.43	0.0	0.0	0.155123394
13:19:00	5.82E+00	0:00:02	-1.51	2.3	1.51	0.0	0.0	0.17860289
13:19:01	5.84E+00	0:00:03	-1.49	2.7	1.49	0.0	0.0	0.172310969
13:19:01	5.87E+00	0:00:03	-1.46	3.2	1.46	0.0	0.0	0.164887958
13:19:02	5.87E+00	0:00:04	-1.47	3.7	1.47	0.0	0.0	0.165956187
13:19:02	5.90E+00	0:00:04	-1.43	4.1	1.43	0.0	0.0	0.155123394
13:19:03	5.91E+00	0:00:05	-1.42	4.6	1.42	0.0	0.0	0.151798723
13:19:03	5.94E+00	0:00:05	-1.39	5.0	1.39	0.0	0.0	0.144013466
13:19:03	5.96E+00	0:00:06	-1.37	5.5	1.37	0.0	0.0	0.137195812
13:19:04	5.97E+00	0:00:06	-1.36	6.0	1.36	0.0	0.0	0.133762385
13:19:04	5.99E+00	0:00:06	-1.34	6.4	1.34	0.0	0.0	0.127946643
13:19:05	6.00E+00	0:00:07	-1.33	6.9	1.33	0.0	0.0	0.124439011
13:19:05	6.02E+00	0:00:07	-1.31	7.3	1.31	0.0	0.0	0.118529258
13:19:06	6.03E+00	0:00:08	-1.30	7.8	1.30	0.0	0.0	0.113709438
13:19:06	6.05E+00	0:00:08	-1.28	8.3	1.28	0.0	0.0	0.108869329
13:19:07	6.06E+00	0:00:09	-1.27	8.7	1.27	0.0	0.0	0.102708055
13:19:07	6.08E+00	0:00:09	-1.25	9.2	1.25	0.0	0.0	0.097743059
13:19:08	6.09E+00	0:00:10	-1.24	9.6	1.24	0.0	0.0	0.093981704
13:19:08	6.10E+00	0:00:10	-1.23	10.1	1.23	0.0	0.0	0.088879956
13:19:09	6.12E+00	0:00:11	-1.21	10.6	1.21	0.0	0.0	0.082462221
13:19:09	6.14E+00	0:00:11	-1.19	11.0	1.19	0.0	0.0	0.077258864
13:19:10	6.15E+00	0:00:12	-1.18	11.5	1.18	0.0	0.0	0.073278336
13:19:10	6.16E+00	0:00:12	-1.17	11.9	1.17	0.0	0.0	0.069298012
13:19:10	6.17E+00	0:00:12	-1.16	12.4	1.16	0.0	0.0	0.063933524
13:19:11	6.19E+00	0:00:13	-1.14	12.9	1.14	0.0	0.0	0.05709529
13:19:11	6.20E+00	0:00:13	-1.13	13.3	1.13	0.0	0.0	0.052963129
13:19:12	6.21E+00	0:00:14	-1.12	13.8	1.12	0.0	0.0	0.048791274
13:19:12	6.23E+00	0:00:14	-1.10	14.2	1.10	0.0	0.0	0.041708421
13:19:13	6.23E+00	0:00:15	-1.10	14.7	1.10	0.0	0.0	0.040285799
13:19:13	6.25E+00	0:00:15	-1.08	15.2	1.08	0.0	0.0	0.033101937
13:19:14	6.27E+00	0:00:16	-1.06	15.6	1.06	0.0	0.0	0.027227254
13:19:14	**6.27E+00**	**0:00:16**	**-1.06**	**16.1**	**1.06**	**0.0**	**0.0**	**0.024280376**
13:19:15	6.29E+00	0:00:17	-1.04	16.5	1.04	0.0	0.0	0.016824494
13:19:15	6.30E+00	0:00:17	-1.03	17.0	1.03	0.0	0.0	0.01224652
13:19:16	6.31E+00	0:00:18	-1.02	17.5	1.02	0.0	0.0	0.007662447
13:19:16	6.32E+00	0:00:18	-1.01	17.9	1.01	0.0	0.0	0.003029471
13:19:16	6.33E+00	0:00:18	-1.00	18.4	1.00	0.0	0.0	-0.00169706
13:19:17	6.35E+00	0:00:19	-0.98	18.8	0.98	0.0	0.0	-0.008021209
13:19:17	6.36E+00	0:00:19	-0.97	19.3	0.97	0.0	0.0	-0.012825499
13:19:18	6.37E+00	0:00:20	-0.96	19.8	0.96	0.0	0.0	-0.01768353
13:19:18	6.38E+00	0:00:20	-0.95	20.2	0.95	0.0	0.0	-0.020998252
13:19:19	6.39E+00	0:00:21	-0.94	20.7	0.94	0.0	0.0	-0.027612001
13:19:19	6.40E+00	0:00:21	-0.93	21.1	0.93	0.0	0.0	-0.03263926
13:19:20	6.41E+00	0:00:22	-0.92	21.6	0.92	0.0	0.0	-0.037772769
13:19:20	6.42E+00	0:00:22	-0.91	22.1	0.91	0.0	0.0	-0.04291974
13:19:21	6.45E+00	0:00:23	-0.88	23.3	0.88	0.0	0.0	-0.055221319
13:19:22	6.48E+00	0:00:24	-0.86	24.3	0.86	0.0	0.0	-0.067830754
13:19:23	6.50E+00	0:00:25	-0.83	25.3	0.83	0.0	0.0	-0.078990199
13:19:24	6.52E+00	0:00:26	-0.81	26.3	0.81	0.0	0.0	-0.09039049
13:19:25	6.53E+00	0:00:27	-0.80	27.3	0.80	0.0	0.0	-0.098214855
13:19:26	6.55E+00	0:00:28	-0.78	28.3	0.78	0.0	0.0	-0.110138279

Time	MW-3 Slug Out Analog#01 mw-3..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:19:27	6.57E+00	0:00:29	-0.76	29.3	0.76	0.0	0.0	-0.120388093
13:19:28	6.59E+00	0:00:30	-0.74	30.3	0.74	0.0	0.0	-0.1329452
13:19:29	6.61E+00	0:00:31	-0.72	31.3	0.72	0.0	0.0	-0.143754599
13:19:30	6.63E+00	0:00:32	-0.70	32.3	0.70	0.0	0.0	-0.154777894
13:19:31	6.64E+00	0:00:33	-0.69	33.3	0.69	0.0	0.0	-0.163865851
13:19:32	6.66E+00	0:00:34	-0.67	34.3	0.67	0.0	0.0	-0.175418624
13:19:34	6.69E+00	0:00:36	-0.64	35.6	0.64	0.0	0.0	-0.192194468
13:19:34	6.70E+00	0:00:36	-0.63	36.3	0.63	0.0	0.0	-0.199557879
13:19:35	6.71E+00	0:00:37	-0.62	37.3	0.62	0.0	0.0	-0.209574083
13:19:36	6.73E+00	0:00:38	-0.60	38.3	0.60	0.0	0.0	-0.219898809
13:19:37	6.74E+00	0:00:39	-0.59	39.3	0.59	0.0	0.0	-0.230401152
13:19:38	6.76E+00	0:00:40	-0.57	40.3	0.57	0.0	0.0	-0.241239456
13:19:39	6.77E+00	0:00:41	-0.56	41.3	0.56	0.0	0.0	-0.255081458
13:19:40	6.79E+00	0:00:42	-0.55	42.3	0.55	0.0	0.0	-0.263603498
13:19:41	6.80E+00	0:00:43	-0.53	43.3	0.53	0.0	0.0	-0.275314612
13:19:42	6.82E+00	0:00:44	-0.51	44.3	0.51	0.0	0.0	-0.29030613
13:19:43	6.83E+00	0:00:45	-0.50	45.3	0.50	0.0	0.0	-0.299555899
13:19:44	6.84E+00	0:00:46	-0.49	46.3	0.49	0.0	0.0	-0.309095446
13:19:45	6.85E+00	0:00:47	-0.48	47.3	0.48	0.0	0.0	-0.318758763
13:19:46	6.87E+00	0:00:48	-0.47	48.3	0.47	0.0	0.0	-0.331987028
13:19:47	6.88E+00	0:00:49	-0.45	49.3	0.45	0.0	0.0	-0.342275046
13:19:48	6.89E+00	0:00:50	-0.44	50.3	0.44	0.0	0.0	-0.356251315
13:19:49	6.90E+00	0:00:51	-0.43	51.3	0.43	0.0	0.0	-0.367036832
13:19:50	6.91E+00	0:00:52	-0.42	52.3	0.42	0.0	0.0	-0.374378919
13:19:51	6.92E+00	0:00:53	-0.41	53.3	0.41	0.0	0.0	-0.385735713
13:19:52	6.93E+00	0:00:54	-0.40	54.3	0.40	0.0	0.0	-0.397289055
13:19:53	6.94E+00	0:00:55	-0.39	55.3	0.39	0.0	0.0	-0.409158165
13:19:54	6.95E+00	0:00:56	-0.38	56.3	0.38	0.0	0.0	-0.417255034
13:19:55	6.96E+00	0:00:57	-0.37	57.3	0.37	0.0	0.0	-0.429807439
13:19:56	6.97E+00	0:00:58	-0.36	58.3	0.36	0.0	0.0	-0.442613118
13:19:57	6.97E+00	0:00:59	-0.36	59.3	0.36	0.0	0.0	-0.446966984
13:19:58	6.98E+00	0:01:00	-0.35	60.3	0.35	0.0	0.0	-0.455807889
13:19:59	6.99E+00	0:01:01	-0.34	61.3	0.34	0.0	0.0	-0.469544156
13:20:00	7.00E+00	0:01:02	-0.33	62.3	0.33	0.0	0.0	-0.478861916
13:20:01	7.01E+00	0:01:03	-0.32	63.3	0.32	0.0	0.0	-0.498119506
13:20:02	7.02E+00	0:01:04	-0.31	64.3	0.31	0.0	0.0	-0.503070352
13:20:03	7.02E+00	0:01:05	-0.31	65.3	0.31	0.0	0.0	-0.508078287
13:20:04	7.03E+00	0:01:06	-0.30	66.3	0.30	0.0	0.0	-0.523603173
13:20:05	7.04E+00	0:01:07	-0.29	67.3	0.29	0.0	0.0	-0.534171185
13:20:06	7.05E+00	0:01:08	-0.29	68.3	0.29	0.0	0.0	-0.545002783
13:20:07	7.05E+00	0:01:09	-0.28	69.3	0.28	0.0	0.0	-0.556111453
13:20:08	7.06E+00	0:01:10	-0.27	70.3	0.27	0.0	0.0	-0.561774192
13:20:09	7.06E+00	0:01:11	-0.27	71.3	0.27	0.0	0.0	-0.573326112
13:20:10	7.07E+00	0:01:12	-0.26	72.3	0.26	0.0	0.0	-0.591420875
13:20:11	7.08E+00	0:01:13	-0.25	73.3	0.25	0.0	0.0	-0.597566654
13:20:12	7.08E+00	0:01:14	-0.25	74.3	0.25	0.0	0.0	-0.603800653
13:20:13	7.09E+00	0:01:15	-0.24	75.3	0.24	0.0	0.0	-0.616543703
13:20:15	7.10E+00	0:01:17	-0.23	77.3	0.23	0.0	0.0	-0.629671992
13:20:16	7.11E+00	0:01:18	-0.22	78.3	0.22	0.0	0.0	-0.650334016
13:20:17	7.11E+00	0:01:19	-0.22	79.3	0.22	0.0	0.0	-0.650334016
13:20:19	7.11E+00	0:01:21	-0.22	80.6	0.22	0.0	0.0	-0.650334016
13:20:19	7.12E+00	0:01:21	-0.21	81.3	0.21	0.0	0.0	-0.671824339
13:20:20	7.13E+00	0:01:22	-0.20	82.4	0.20	0.0	0.0	-0.702239489
13:20:30	7.16E+00	0:01:32	-0.17	92.3	0.17	0.0	0.0	-0.779891912
13:20:40	7.18E+00	0:01:42	-0.15	102.3	0.15	0.0	0.0	-0.819300799

Time	MW-3 Slug Out Analog#01 mw-3..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:20:50	7.19E+00	0:01:52	-0.14	112.3	0.14	0.0	0.0	-0.862962545
13:21:00	7.21E+00	0:02:02	-0.12	122.3	0.12	0.0	0.0	-0.911155437
13:21:10	7.23E+00	0:02:12	-0.10	132.3	0.10	0.0	0.0	-0.980468315
13:21:20	7.24E+00	0:02:22	-0.09	142.3	0.09	0.0	0.0	-1.044793462
13:21:30	7.24E+00	0:02:32	-0.09	152.3	0.09	0.0	0.0	-1.044793462
13:21:40	7.24E+00	0:02:42	-0.09	162.3	0.09	0.0	0.0	-1.062482108
13:21:50	7.25E+00	0:02:52	-0.08	172.3	0.08	0.0	0.0	-1.120330794
13:22:00	7.26E+00	0:03:02	-0.07	182.3	0.07	0.0	0.0	-1.142064735
13:22:10	7.26E+00	0:03:12	-0.07	192.3	0.07	0.0	0.0	-1.142064735
13:22:20	7.26E+00	0:03:22	-0.07	202.3	0.07	0.0	0.0	-1.164309429
13:22:30	7.27E+00	0:03:32	-0.06	212.3	0.06	0.0	0.0	-1.212539525
13:22:40	7.27E+00	0:03:42	-0.06	222.3	0.06	0.0	0.0	-1.212539525
13:22:50	7.28E+00	0:03:52	-0.05	232.3	0.05	0.0	0.0	-1.266802735
13:23:00	7.27E+00	0:04:02	-0.06	242.3	0.06	0.0	0.0	-1.238824187
13:23:10	7.28E+00	0:04:12	-0.05	252.3	0.05	0.0	0.0	-1.296708622
13:23:20	7.28E+00	0:04:22	-0.05	262.3	0.05	0.0	0.0	-1.296708622
13:23:30	7.28E+00	0:04:32	-0.05	272.3	0.05	0.0	0.0	-1.296708622
13:23:40	7.28E+00	0:04:42	-0.05	282.3	0.05	0.0	0.0	-1.296708622
13:23:50	7.28E+00	0:04:52	-0.05	292.3	0.05	0.0	0.0	-1.328827157
13:24:00	7.29E+00	0:05:02	-0.04	302.3	0.04	0.0	0.0	-1.363512104
13:24:10	7.29E+00	0:05:12	-0.04	312.3	0.04	0.0	0.0	-1.363512104
13:24:20	7.29E+00	0:05:22	-0.04	322.3	0.04	0.0	0.0	-1.401209493
13:24:30	7.29E+00	0:05:32	-0.04	332.3	0.04	0.0	0.0	-1.401209493
13:24:40	7.29E+00	0:05:42	-0.04	342.3	0.04	0.0	0.0	-1.442492798
13:24:50	7.29E+00	0:05:52	-0.04	352.3	0.04	0.0	0.0	-1.401209493
13:25:00	7.29E+00	0:06:02	-0.04	362.3	0.04	0.0	0.0	-1.401209493
13:25:10	7.29E+00	0:06:12	-0.04	372.3	0.04	0.0	0.0	-1.442492798
13:25:20	7.29E+00	0:06:22	-0.04	382.3	0.04	0.0	0.0	-1.442492798

Vernon Co. MW-4P Slug In



06/16/2003

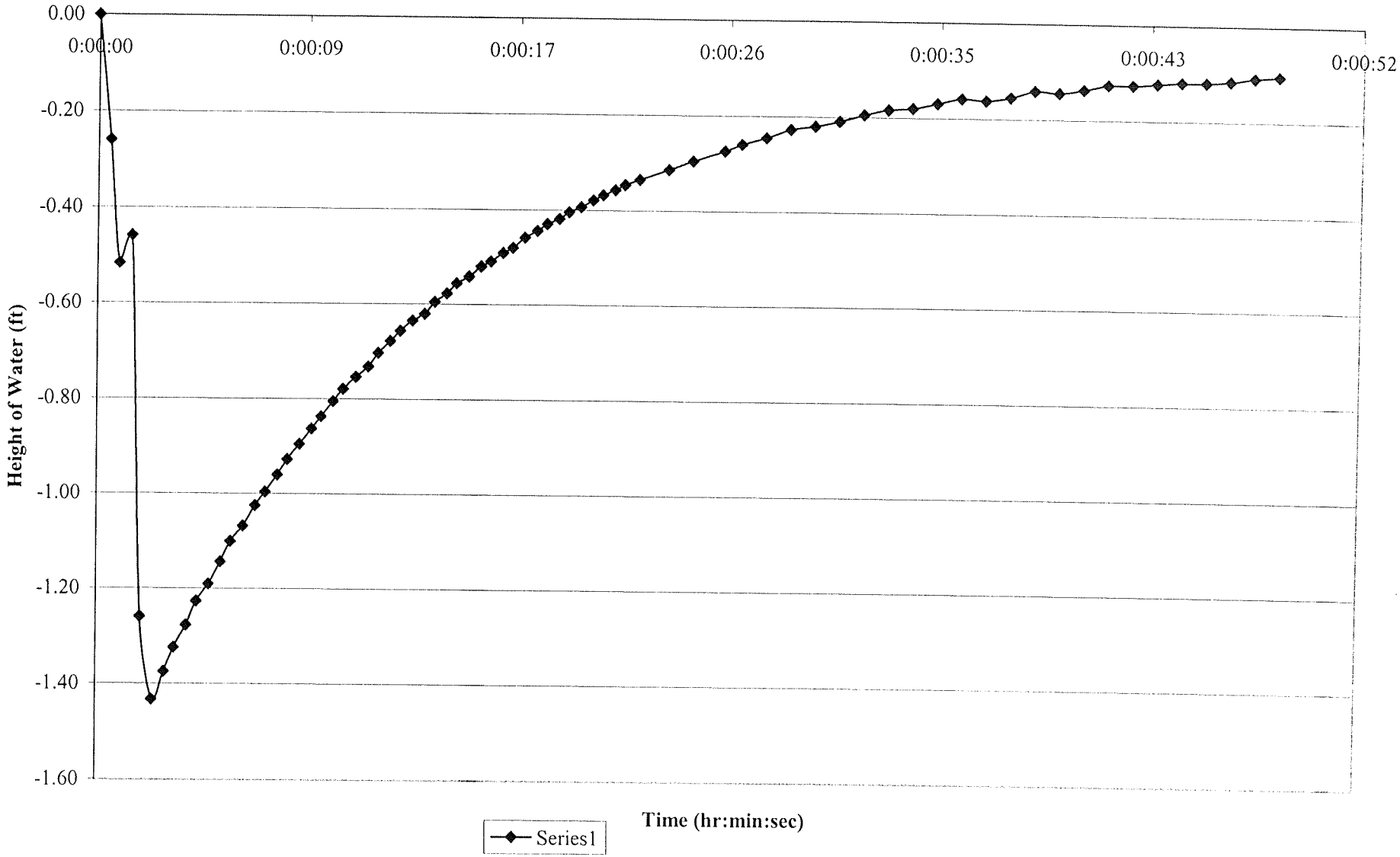
0946W4PA.xls MW4pa graph

Time	MW-4 Slug In Analog#01 mw-4p..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
14:13:15	6.92E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
14:13:15	7.32E+00	0:00:00	0.40	0.4	0.40	0.0	0.00	-0.397289055
14:13:15	7.45E+00	0:00:01	0.52	0.9	0.52	0.0	0.00	-0.281249265
14:13:16	7.48E+00	0:00:01	0.56	1.3	0.56	0.0	0.00	-0.255081458
14:13:16	7.52E+00	0:00:02	0.60	1.8	0.60	0.0	0.00	-0.22250068
14:13:17	7.74E+00	0:00:02	0.82	2.3	0.82	0.0	0.00	-0.088469538
14:13:17	8.98E+00	0:00:03	2.06	2.7	2.06	0.0	0.00	0.313297626
14:13:18	8.77E+00	0:00:03	1.84	3.2	1.84	0.0	0.00	0.265855114
14:13:18	7.42E+00	0:00:04	0.50	3.6	0.50	0.0	0.00	-0.302683458
14:13:19	7.97E+00	0:00:04	1.04	4.1	1.04	0.0	0.00	0.018325945
14:13:19	7.58E+00	0:00:05	0.65	4.6	0.65	0.0	0.00	-0.184887342
14:13:20	7.73E+00	0:00:05	0.81	5.0	0.81	0.0	0.00	-0.09039049
14:13:20	7.72E+00	0:00:06	0.80	5.5	0.80	0.0	0.00	-0.098160408
14:13:21	7.62E+00	0:00:06	0.69	6.0	0.69	0.0	0.00	-0.159266765
14:13:21	7.58E+00	0:00:06	0.66	6.4	0.66	0.0	0.00	-0.182500738
14:13:22	7.54E+00	0:00:07	0.62	6.9	0.62	0.0	0.00	-0.207048292
14:13:22	7.51E+00	0:00:07	0.59	7.3	0.59	0.0	0.00	-0.230401152
14:13:22	7.48E+00	0:00:08	0.55	7.8	0.55	0.0	0.00	-0.257903598
14:13:23	7.45E+00	0:00:08	0.53	8.3	0.53	0.0	0.00	-0.275232754
14:13:23	7.42E+00	0:00:09	0.50	8.7	0.50	0.0	0.00	-0.302683458
14:13:24	7.40E+00	0:00:09	0.48	9.2	0.48	0.0	0.00	-0.322028247
14:13:24	7.38E+00	0:00:10	0.46	9.6	0.46	0.0	0.00	-0.338755391
14:13:25	7.36E+00	0:00:10	0.44	10.1	0.44	0.0	0.00	-0.359816808
14:13:25	7.35E+00	0:00:11	0.42	10.6	0.42	0.0	0.00	-0.374378919
14:13:26	7.32E+00	0:00:11	0.40	11.0	0.40	0.0	0.00	-0.397289055
14:13:26	7.31E+00	0:00:11	0.38	11.5	0.38	0.0	0.00	-0.417255034
14:13:26	7.29E+00	0:00:12	0.37	11.9	0.37	0.0	0.00	-0.429807439
14:13:27	7.28E+00	0:00:12	0.35	12.4	0.35	0.0	0.00	-0.45136494
14:13:27	7.26E+00	0:00:13	0.34	12.9	0.34	0.0	0.00	-0.46941614
14:13:28	7.25E+00	0:00:13	0.32	13.3	0.32	0.0	0.00	-0.488383979
14:13:28	7.24E+00	0:00:14	0.32	13.8	0.32	0.0	0.00	-0.498119506
14:13:29	7.23E+00	0:00:14	0.30	14.2	0.30	0.0	0.00	-0.518270803
14:13:29	7.22E+00	0:00:15	0.30	14.7	0.30	0.0	0.00	-0.528708289
14:13:30	7.21E+00	0:00:15	0.29	15.2	0.29	0.0	0.00	-0.545002783
14:13:30	7.19E+00	0:00:16	0.27	15.6	0.27	0.0	0.00	-0.567511744
14:13:31	7.19E+00	0:00:16	0.26	16.1	0.26	0.0	0.00	-0.57921938
14:13:31	7.18E+00	0:00:17	0.26	16.6	0.26	0.0	0.00	-0.591420875
14:13:32	7.17E+00	0:00:17	0.25	17.0	0.25	0.0	0.00	-0.603800653
14:13:32	7.16E+00	0:00:17	0.23	17.5	0.23	0.0	0.00	-0.629671992
14:13:32	7.15E+00	0:00:18	0.23	17.9	0.23	0.0	0.00	-0.63638802
14:13:33	7.15E+00	0:00:18	0.22	18.4	0.22	0.0	0.00	-0.650139918
14:13:33	7.14E+00	0:00:19	0.22	18.9	0.22	0.0	0.00	-0.664542099
14:13:34	7.13E+00	0:00:19	0.21	19.3	0.21	0.0	0.00	-0.679230772
14:13:34	7.12E+00	0:00:20	0.20	19.8	0.20	0.0	0.00	-0.694433686
14:13:35	7.12E+00	0:00:20	0.20	20.2	0.20	0.0	0.00	-0.694433686
14:13:35	7.11E+00	0:00:21	0.19	20.7	0.19	0.0	0.00	-0.71828503
14:13:36	7.12E+00	0:00:21	0.19	21.2	0.19	0.0	0.00	-0.710188161
14:13:36	7.11E+00	0:00:22	0.18	21.6	0.18	0.0	0.00	-0.734946211
14:13:37	7.10E+00	0:00:22	0.18	22.1	0.18	0.0	0.00	-0.752517739
14:13:37	7.10E+00	0:00:23	0.17	22.6	0.17	0.0	0.00	-0.761452112
14:13:38	7.08E+00	0:00:24	0.16	23.7	0.16	0.0	0.00	-0.799149502
14:13:40	7.07E+00	0:00:25	0.15	25.0	0.15	0.0	0.00	-0.829738285
14:13:40	7.07E+00	0:00:26	0.14	25.7	0.14	0.0	0.00	-0.840432807
14:13:41	7.06E+00	0:00:27	0.13	26.7	0.13	0.0	0.00	-0.874518734
14:13:42	7.05E+00	0:00:28	0.13	27.7	0.13	0.0	0.00	-0.886390849

Time	MW-4 Slug In Analog#01 mw-4p..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
14:13:43	7.05E+00	0:00:29	0.12	28.7	0.12	0.0	0.00	-0.911155437
14:13:44	7.04E+00	0:00:30	0.12	29.7	0.12	0.0	0.00	-0.924088239
14:13:45	7.03E+00	0:00:31	0.11	30.7	0.11	0.0	0.00	-0.951169913
14:13:46	7.03E+00	0:00:32	0.11	31.7	0.11	0.0	0.00	-0.951169913
14:13:47	7.03E+00	0:00:33	0.10	32.7	0.10	0.0	0.00	-0.980053318
14:13:48	7.02E+00	0:00:34	0.10	33.7	0.10	0.0	0.00	-0.995678626
14:13:49	7.02E+00	0:00:35	0.10	34.7	0.10	0.0	0.00	-1.011441043
14:13:50	7.02E+00	0:00:36	0.09	35.7	0.09	0.0	0.00	-1.027797162
14:13:51	7.02E+00	0:00:37	0.09	36.7	0.09	0.0	0.00	-1.027797162
14:13:52	7.01E+00	0:00:38	0.09	37.7	0.09	0.0	0.00	-1.044793462
14:13:53	7.01E+00	0:00:39	0.09	38.7	0.09	0.0	0.00	-1.062482108
14:13:54	7.01E+00	0:00:40	0.09	39.7	0.09	0.0	0.00	-1.062482108
14:13:55	7.00E+00	0:00:41	0.08	40.7	0.08	0.0	0.00	-1.100179498
14:13:56	7.0022	0:00:42	0.08	41.7	0.08	0.0	0.00	-1.100179498
14:13:57	6.9986	0:00:43	0.08	42.7	0.08	0.0	0.00	-1.120330794
14:13:58	6.9986	0:00:44	0.08	43.7	0.08	0.0	0.00	-1.120330794
14:13:59	6.9914	0:00:45	0.07	44.7	0.07	0.0	0.00	-1.163675884
14:14:00	6.995	0:00:46	0.07	45.7	0.07	0.0	0.00	-1.141462802
14:14:01	6.9878	0:00:47	0.07	46.7	0.07	0.0	0.00	-1.187086643
14:14:02	6.9878	0:00:48	0.07	47.7	0.07	0.0	0.00	-1.187086643
14:14:03	6.9878	0:00:49	0.07	48.7	0.07	0.0	0.00	-1.187086643
14:14:04	6.9841	0:00:50	0.06	49.7	0.06	0.0	0.00	-1.212539525
14:14:05	6.98E+00	0:00:51	0.06	50.7	0.06	0.0	0.00	-1.238824187
14:14:06	6.9841	0:00:52	0.06	51.7	0.06	0.0	0.00	-1.212539525
14:14:07	6.9805	0:00:53	0.06	52.7	0.06	0.0	0.00	-1.238824187
14:14:08	6.9805	0:00:54	0.06	53.7	0.06	0.0	0.00	-1.238824187
14:14:09	6.9769	0:00:55	0.05	54.7	0.05	0.0	0.00	-1.266802735
14:14:10	6.9769	0:00:56	0.05	55.7	0.05	0.0	0.00	-1.266802735
14:14:11	6.9769	0:00:57	0.05	56.7	0.05	0.0	0.00	-1.266802735
14:14:12	6.9769	0:00:58	0.05	57.7	0.05	0.0	0.00	-1.266802735
14:14:13	6.9769	0:00:59	0.05	58.7	0.05	0.0	0.00	-1.266802735
14:14:14	6.9733	0:01:00	0.05	59.7	0.05	0.0	0.00	-1.296708622
14:14:15	6.9733	0:01:01	0.05	60.7	0.05	0.0	0.00	-1.296708622
14:14:16	6.9769	0:01:02	0.05	61.7	0.05	0.0	0.00	-1.266802735
14:14:17	6.9697	0:01:03	0.05	62.7	0.05	0.0	0.00	-1.328827157
14:14:18	6.9733	0:01:04	0.05	63.7	0.05	0.0	0.00	-1.296708622
14:14:19	6.9697	0:01:05	0.05	64.7	0.05	0.0	0.00	-1.328827157
14:14:20	6.9733	0:01:06	0.05	65.7	0.05	0.0	0.00	-1.296708622
14:14:21	6.9697	0:01:07	0.05	66.7	0.05	0.0	0.00	-1.328827157
14:14:22	6.9697	0:01:08	0.05	67.7	0.05	0.0	0.00	-1.328827157
14:14:24	6.97E+00	0:01:09	0.04	69.0	0.04	0.0	0.00	-1.363512104
14:14:24	6.9697	0:01:10	0.05	69.7	0.05	0.0	0.00	-1.328827157
14:14:25	6.9661	0:01:11	0.04	70.7	0.04	0.0	0.00	-1.363512104
14:14:26	6.9661	0:01:12	0.04	71.7	0.04	0.0	0.00	-1.363512104
14:14:27	6.9661	0:01:13	0.04	72.7	0.04	0.0	0.00	-1.363512104
14:14:28	6.9625	0:01:14	0.04	73.7	0.04	0.0	0.00	-1.401209493
14:14:29	6.9697	0:01:15	0.05	74.7	0.05	0.0	0.00	-1.328827157
14:14:30	6.9661	0:01:16	0.04	75.7	0.04	0.0	0.00	-1.363512104
14:14:31	6.9661	0:01:17	0.04	76.7	0.04	0.0	0.00	-1.363512104
14:14:32	6.9661	0:01:18	0.04	77.7	0.04	0.0	0.00	-1.363512104
14:14:33	6.9625	0:01:19	0.04	78.7	0.04	0.0	0.00	-1.401209493
14:14:34	6.9625	0:01:20	0.04	79.7	0.04	0.0	0.00	-1.401209493
14:14:35	6.9625	0:01:21	0.04	80.7	0.04	0.0	0.00	-1.401209493
14:14:36	6.9589	0:01:22	0.04	81.7	0.04	0.0	0.00	-1.442492798
14:14:37	6.9625	0:01:23	0.04	82.8	0.04	0.0	0.00	-1.401209493

Time	MW-4 Slug In Analog#01 mw-4p..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
14:14:47	6.9553	0:01:33	0.03	92.7	0.03	0.0	0.00	-1.488116639
14:14:57	6.9553	0:01:43	0.03	102.7	0.03	0.0	0.00	-1.488116639
14:15:07	6.948	0:01:53	0.03	112.7	0.03	0.0	0.00	-1.598599459
14:15:17	6.948	0:02:03	0.03	122.7	0.03	0.0	0.00	-1.598599459
14:15:27	6.9517	0:02:13	0.03	132.7	0.03	0.0	0.00	-1.539102157
14:15:37	6.948	0:02:23	0.03	142.7	0.03	0.0	0.00	-1.598599459
14:15:47	6.948	0:02:33	0.03	152.7	0.03	0.0	0.00	-1.598599459
14:15:57	6.9444	0:02:43	0.02	162.7	0.02	0.0	0.00	-1.665546249
14:16:07	6.9444	0:02:53	0.02	172.7	0.02	0.0	0.00	-1.665546249
14:16:17	6.948	0:03:03	0.03	182.7	0.03	0.0	0.00	-1.598599459
14:16:27	6.9408	0:03:13	0.02	192.7	0.02	0.0	0.00	-1.744727495
14:16:37	6.9408	0:03:23	0.02	202.7	0.02	0.0	0.00	-1.744727495
14:16:47	6.9408	0:03:33	0.02	212.7	0.02	0.0	0.00	-1.744727495
14:16:57	6.9372	0:03:43	0.01	222.7	0.01	0.0	0.00	-1.841637508
14:17:07	6.9408	0:03:53	0.02	232.7	0.02	0.0	0.00	-1.744727495
14:17:17	6.9372	0:04:03	0.01	242.7	0.01	0.0	0.00	-1.841637508
14:17:27	6.9336	0:04:13	0.01	252.7	0.01	0.0	0.00	-1.966576245
14:17:37	6.9372	0:04:23	0.01	262.7	0.01	0.0	0.00	-1.841637508
14:17:47	6.93	0:04:33	0.01	272.7	0.01	0.0	0.00	-2.142667504
14:17:57	6.9336	0:04:43	0.01	282.7	0.01	0.0	0.00	-1.966576245
14:18:07	6.9336	0:04:53	0.01	292.7	0.01	0.0	0.00	-1.966576245
14:18:17	6.9336	0:05:03	0.01	302.7	0.01	0.0	0.00	-1.966576245
14:18:27	6.9336	0:05:13	0.01	312.7	0.01	0.0	0.00	-1.966576245
14:18:37	6.9336	0:05:23	0.01	322.7	0.01	0.0	0.00	-1.966576245
14:18:47	6.9372	0:05:33	0.01	332.7	0.01	0.0	0.00	-1.841637508
14:18:57	6.93	0:05:43	0.01	342.7	0.01	0.0	0.00	-2.142667504
14:19:07	6.93	0:05:53	0.01	352.7	0.01	0.0	0.00	-2.142667504
14:19:17	6.93	0:06:03	0.01	362.7	0.01	0.0	0.00	-2.142667504
14:19:27	6.93	0:06:13	0.01	372.7	0.01	0.0	0.00	-2.142667504
14:19:37	6.93	0:06:23	0.01	382.7	0.01	0.0	0.00	-2.142667504
14:19:47	6.9336	0:06:33	0.01	392.7	0.01	0.0	0.00	-1.966576245
14:19:57	6.9336	0:06:43	0.01	402.7	0.01	0.0	0.00	-1.966576245
14:20:07	6.9336	0:06:53	0.01	412.7	0.01	0.0	0.00	-1.966576245
14:20:17	6.9336	0:07:03	0.01	422.7	0.01	0.0	0.00	-1.966576245

Vernon Co. MW-4P Slug Out



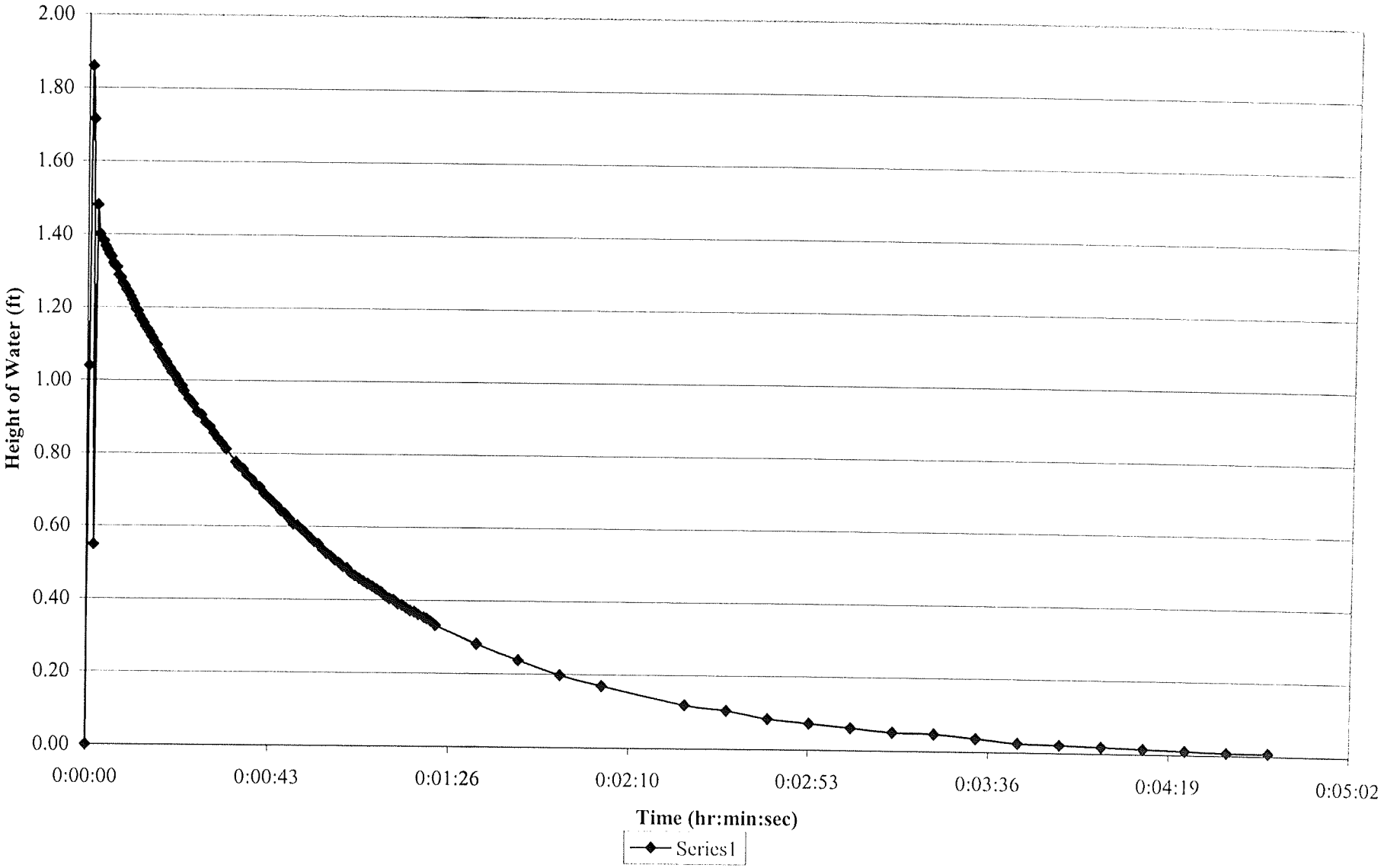
06/16/2003

0946W4PB.xls MW4b graph

Time	MW-4 Slug Out Analog#01 mw-4p..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
14:23:33	6.94E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
14:23:33	6.68E+00	0:00:01	-0.26	0.5	0.26	0.0	0.00	-0.585360853
14:23:34	6.43E+00	0:00:01	-0.52	0.9	0.52	0.0	0.00	-0.287266141
14:23:34	6.49E+00	0:00:01	-0.46	1.4	0.46	0.0	0.00	-0.338755391
14:23:35	5.68E+00	0:00:02	-1.26	1.8	1.26	0.0	0.00	0.100232652
14:23:35	5.51E+00	0:00:02	-1.43	2.3	1.43	0.0	0.00	0.156215883
14:23:36	5.57E+00	0:00:03	-1.38	2.8	1.38	0.0	0.00	0.138334282
14:23:36	5.62E+00	0:00:03	-1.32	3.2	1.32	0.0	0.00	0.122084751
14:23:37	5.67E+00	0:00:04	-1.28	3.7	1.28	0.0	0.00	0.106428895
14:23:37	5.72E+00	0:00:04	-1.23	4.1	1.23	0.0	0.00	0.088879956
14:23:37	5.75E+00	0:00:05	-1.19	4.6	1.19	0.0	0.00	0.075948225
14:23:38	5.80E+00	0:00:05	-1.14	5.1	1.14	0.0	0.00	0.058463986
14:23:38	5.84E+00	0:00:06	-1.10	5.5	1.10	0.0	0.00	0.041708421
14:23:39	5.88E+00	0:00:06	-1.07	6.0	1.07	0.0	0.00	0.028693228
14:23:39	5.92E+00	0:00:06	-1.03	6.5	1.03	0.0	0.00	0.010723865
14:23:40	5.95E+00	0:00:07	-1.00	6.9	1.00	0.0	0.00	-0.00169706
14:23:40	5.98E+00	0:00:07	-0.96	7.4	0.96	0.0	0.00	-0.01768353
14:23:41	6.02E+00	0:00:08	-0.93	7.8	0.93	0.0	0.00	-0.03263926
14:23:41	6.05E+00	0:00:08	-0.90	8.3	0.90	0.0	0.00	-0.048128443
14:23:42	6.08E+00	0:00:09	-0.86	8.8	0.86	0.0	0.00	-0.064190546
14:23:42	6.11E+00	0:00:09	-0.84	9.2	0.84	0.0	0.00	-0.077118909
14:23:43	6.14E+00	0:00:10	-0.80	9.7	0.80	0.0	0.00	-0.094258073
14:23:43	6.16E+00	0:00:10	-0.78	10.1	0.78	0.0	0.00	-0.10812817
14:23:43	6.19E+00	0:00:11	-0.75	10.6	0.75	0.0	0.00	-0.122455892
14:23:44	6.21E+00	0:00:11	-0.73	11.1	0.73	0.0	0.00	-0.135073808
14:23:44	6.24E+00	0:00:12	-0.70	11.5	0.70	0.0	0.00	-0.152550738
14:23:45	6.27E+00	0:00:12	-0.68	12.0	0.68	0.0	0.00	-0.168450148
14:23:45	6.29E+00	0:00:12	-0.66	12.4	0.66	0.0	0.00	-0.182500738
14:23:46	6.31E+00	0:00:13	-0.64	12.9	0.64	0.0	0.00	-0.197089511
14:23:46	6.32E+00	0:00:13	-0.62	13.4	0.62	0.0	0.00	-0.207048292
14:23:47	6.35E+00	0:00:14	-0.60	13.8	0.60	0.0	0.00	-0.225118234
14:23:47	6.37E+00	0:00:14	-0.58	14.3	0.58	0.0	0.00	-0.238448011
14:23:48	6.39E+00	0:00:15	-0.56	14.7	0.56	0.0	0.00	-0.255081458
14:23:48	6.40E+00	0:00:15	-0.54	15.2	0.54	0.0	0.00	-0.266481749
14:23:49	6.42E+00	0:00:16	-0.52	15.7	0.52	0.0	0.00	-0.284247283
14:23:49	6.44E+00	0:00:16	-0.51	16.1	0.51	0.0	0.00	-0.293367549
14:23:49	6.45E+00	0:00:17	-0.49	16.6	0.49	0.0	0.00	-0.309095446
14:23:50	6.46E+00	0:00:17	-0.48	17.0	0.48	0.0	0.00	-0.318758763
14:23:50	6.49E+00	0:00:18	-0.46	17.5	0.46	0.0	0.00	-0.338755391
14:23:51	6.50E+00	0:00:18	-0.44	18.0	0.44	0.0	0.00	-0.352714855
14:23:51	6.51E+00	0:00:18	-0.43	18.4	0.43	0.0	0.00	-0.367036832
14:23:52	6.53E+00	0:00:19	-0.42	18.9	0.42	0.0	0.00	-0.378200776
14:23:52	6.54E+00	0:00:19	-0.40	19.3	0.40	0.0	0.00	-0.393403691
14:23:53	6.55E+00	0:00:20	-0.39	19.8	0.39	0.0	0.00	-0.405165644
14:23:53	6.57E+00	0:00:20	-0.38	20.3	0.38	0.0	0.00	-0.421475395
14:23:54	6.58E+00	0:00:21	-0.37	20.7	0.37	0.0	0.00	-0.434034183
14:23:54	6.59E+00	0:00:21	-0.36	21.2	0.36	0.0	0.00	-0.446966984
14:23:55	6.60E+00	0:00:22	-0.35	21.6	0.35	0.0	0.00	-0.460296761
14:23:55	6.61E+00	0:00:22	-0.34	22.2	0.34	0.0	0.00	-0.474178048
14:23:56	6.63E+00	0:00:23	-0.31	23.4	0.31	0.0	0.00	-0.503070352
14:23:57	6.65E+00	0:00:24	-0.30	24.4	0.30	0.0	0.00	-0.528855035
14:23:59	6.67E+00	0:00:26	-0.27	25.7	0.27	0.0	0.00	-0.561774192
14:23:59	6.68E+00	0:00:26	-0.26	26.4	0.26	0.0	0.00	-0.585360853
14:24:00	6.70E+00	0:00:27	-0.25	27.4	0.25	0.0	0.00	-0.610125442
14:24:01	6.72E+00	0:00:28	-0.23	28.4	0.23	0.0	0.00	-0.64320954

Time	MW-4 Slug Out Analog#01 mw-4p..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
14:24:02	6.72E+00	0:00:29	-0.22	29.4	0.22	0.0	0.00	-0.657379957
14:24:03	6.74E+00	0:00:30	-0.21	30.4	0.21	0.0	0.00	-0.679230772
14:24:04	6.75E+00	0:00:31	-0.19	31.4	0.19	0.0	0.00	-0.710188161
14:24:05	6.76E+00	0:00:32	-0.18	32.4	0.18	0.0	0.00	-0.735182177
14:24:06	6.76E+00	0:00:33	-0.18	33.4	0.18	0.0	0.00	-0.743763467
14:24:07	6.77E+00	0:00:34	-0.17	34.4	0.17	0.0	0.00	-0.770574152
14:24:08	6.79E+00	0:00:35	-0.16	35.4	0.16	0.0	0.00	-0.799149502
14:24:09	6.78E+00	0:00:36	-0.16	36.4	0.16	0.0	0.00	-0.789413975
14:24:10	6.79E+00	0:00:37	-0.16	37.4	0.16	0.0	0.00	-0.809108283
14:24:11	6.80E+00	0:00:38	-0.14	38.4	0.14	0.0	0.00	-0.851705903
14:24:12	6.80E+00	0:00:39	-0.14	39.4	0.14	0.0	0.00	-0.840733669
14:24:13	6.81E+00	0:00:40	-0.14	40.4	0.14	0.0	0.00	-0.862962545
14:24:14	6.82E+00	0:00:41	-0.13	41.4	0.13	0.0	0.00	-0.898596649
14:24:15	6.82E+00	0:00:42	-0.13	42.4	0.13	0.0	0.00	-0.898596649
14:24:16	6.82E+00	0:00:43	-0.12	43.4	0.12	0.0	0.00	-0.911155437
14:24:17	6.83E+00	0:00:44	-0.12	44.4	0.12	0.0	0.00	-0.924088239
14:24:18	6.83E+00	0:00:45	-0.12	45.4	0.12	0.0	0.00	-0.924088239
14:24:19	6.83E+00	0:00:46	-0.12	46.4	0.12	0.0	0.00	-0.937418016
14:24:20	6.84E+00	0:00:47	-0.11	47.4	0.11	0.0	0.00	-0.965772739
14:24:21	6.84E+00	0:00:48	-0.10	48.4	0.10	0.0	0.00	-0.980468315
14:24:22	6.84E+00	0:00:49	-0.10	49.4	0.10	0.0	0.00	-0.980468315
14:24:23	6.84E+00	0:00:50	-0.10	50.4	0.10	0.0	0.00	-0.980468315
14:24:24	6.85E+00	0:00:51	-0.10	51.4	0.10	0.0	0.00	-1.011441043
14:24:25	6.85E+00	0:00:52	-0.09	52.4	0.09	0.0	0.00	-1.027797162
14:24:26	6.85E+00	0:00:53	-0.09	53.4	0.09	0.0	0.00	-1.027797162
14:24:27	6.85E+00	0:00:54	-0.09	54.4	0.09	0.0	0.00	-1.044793462
14:24:28	6.85E+00	0:00:55	-0.09	55.4	0.09	0.0	0.00	-1.027797162
14:24:29	6.85E+00	0:00:56	-0.09	56.4	0.09	0.0	0.00	-1.044793462
14:24:30	6.86E+00	0:00:57	-0.08	57.4	0.08	0.0	0.00	-1.080921908
14:24:31	6.85E+00	0:00:58	-0.09	58.4	0.09	0.0	0.00	-1.044793462
14:24:32	6.8506	0:00:59	-0.09	59.4	0.09	0.0	0.00	-1.027797162
14:24:33	6.8614	0:01:00	-0.08	60.4	0.08	0.0	0.00	-1.080921908
14:24:34	6.8614	0:01:01	-0.08	61.4	0.08	0.0	0.00	-1.080921908
14:24:35	6.8578	0:01:02	-0.09	62.4	0.09	0.0	0.00	-1.062482108
14:24:36	6.865	0:01:03	-0.08	63.4	0.08	0.0	0.00	-1.100179498
14:24:37	6.865	0:01:04	-0.08	64.4	0.08	0.0	0.00	-1.100179498
14:24:38	6.8614	0:01:05	-0.08	65.4	0.08	0.0	0.00	-1.080921908
14:24:39	6.8686	0:01:06	-0.08	66.4	0.08	0.0	0.00	-1.120330794
14:24:40	6.8723	0:01:07	-0.07	67.4	0.07	0.0	0.00	-1.142064735
14:24:41	6.87E+00	0:01:08	-0.08	68.4	0.08	0.0	0.00	-1.100179498
14:24:42	6.8723	0:01:09	-0.07	69.4	0.07	0.0	0.00	-1.142064735
14:24:44	6.8723	0:01:11	-0.07	70.7	0.07	0.0	0.00	-1.142064735
14:24:44	6.8723	0:01:11	-0.07	71.4	0.07	0.0	0.00	-1.142064735
14:24:45	6.8723	0:01:12	-0.07	72.4	0.07	0.0	0.00	-1.142064735
14:24:46	6.8759	0:01:13	-0.07	73.4	0.07	0.0	0.00	-1.164309429
14:24:47	6.8686	0:01:14	-0.08	74.4	0.08	0.0	0.00	-1.120330794
14:24:48	6.8759	0:01:15	-0.07	75.4	0.07	0.0	0.00	-1.164309429
14:24:49	6.8759	0:01:16	-0.07	76.4	0.07	0.0	0.00	-1.164309429
14:24:50	6.8795	0:01:17	-0.06	77.4	0.06	0.0	0.00	-1.187755303
14:24:51	6.8759	0:01:18	-0.07	78.4	0.07	0.0	0.00	-1.164309429
14:24:52	6.8759	0:01:19	-0.07	79.4	0.07	0.0	0.00	-1.164309429
14:24:53	6.8795	0:01:20	-0.06	80.4	0.06	0.0	0.00	-1.187755303
14:24:54	6.8759	0:01:21	-0.07	81.4	0.07	0.0	0.00	-1.164309429
14:24:55	6.8795	0:01:23	-0.06	82.5	0.06	0.0	0.00	-1.187755303

Vernon Co. MW-6 Slug In



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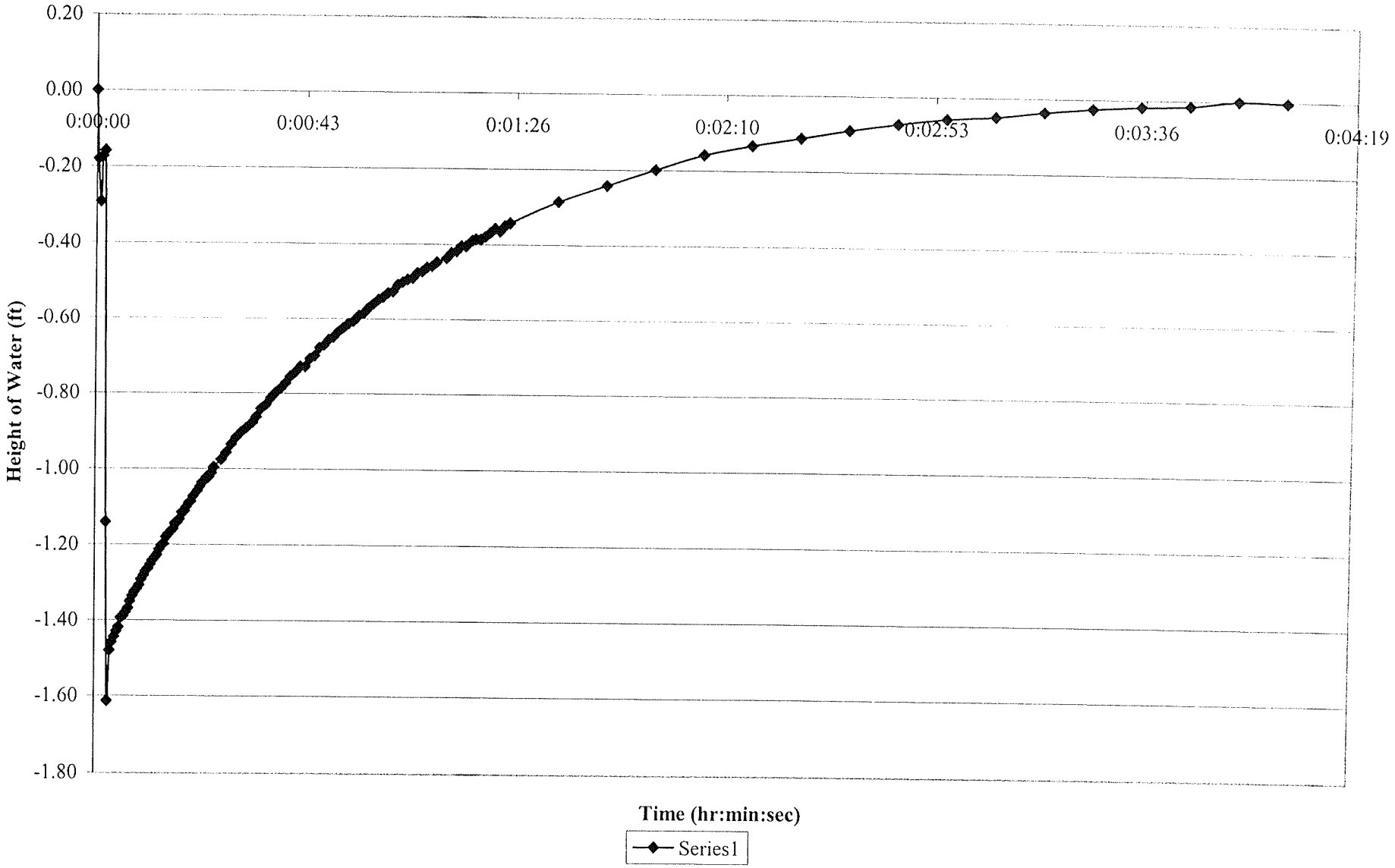
0946W6A.xls MW6a graph

Time	MW-6 Slug In Analog#01 mw-6..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:43:03	7.49E+00	0:00:00	0.00	0.0	0.00	0.0	0.0	#NUM!
13:43:04	8.53E+00	0:00:00	1.04	0.5	1.04	0.0	0.0	0.016824494
13:43:04	9.35E+00	0:00:01	1.86	0.9	1.86	0.0	0.0	0.269232664
13:43:05	9.20E+00	0:00:01	1.71	1.4	1.71	0.0	0.0	0.234112158
13:43:05	8.04E+00	0:00:02	0.55	1.8	0.55	0.0	0.0	-0.260744197
13:43:06	8.97E+00	0:00:02	1.48	2.3	1.48	0.0	0.0	0.170203023
13:43:06	8.89E+00	0:00:03	1.40	2.8	1.40	0.0	0.0	0.146252102
13:43:07	8.87E+00	0:00:04	1.38	3.7	1.38	0.0	0.0	0.140602308
13:43:07	8.86E+00	0:00:04	1.37	4.1	1.37	0.0	0.0	0.13605435
13:43:08	8.85E+00	0:00:05	1.36	4.6	1.36	0.0	0.0	0.13261185
13:43:08	8.84E+00	0:00:05	1.35	5.0	1.35	0.0	0.0	0.129141846
13:43:09	8.83E+00	0:00:06	1.34	5.5	1.34	0.0	0.0	0.126780577
13:43:09	8.81E+00	0:00:06	1.32	6.0	1.32	0.0	0.0	0.120902818
13:43:10	8.80E+00	0:00:06	1.31	6.4	1.31	0.0	0.0	0.118529258
13:43:10	8.80E+00	0:00:07	1.31	6.9	1.31	0.0	0.0	0.117337595
13:43:10	8.78E+00	0:00:07	1.29	7.3	1.29	0.0	0.0	0.110084423
13:43:11	8.77E+00	0:00:08	1.28	7.8	1.28	0.0	0.0	0.107650826
13:43:11	8.76E+00	0:00:08	1.27	8.2	1.27	0.0	0.0	0.102708055
13:43:12	8.75E+00	0:00:09	1.26	8.7	1.26	0.0	0.0	0.100232652
13:43:12	8.74E+00	0:00:09	1.25	9.1	1.25	0.0	0.0	0.09649289
13:43:13	8.73E+00	0:00:10	1.24	9.6	1.24	0.0	0.0	0.093981704
13:43:13	8.72E+00	0:00:10	1.23	10.1	1.23	0.0	0.0	0.090187488
13:43:14	8.71E+00	0:00:10	1.22	10.5	1.22	0.0	0.0	0.086324231
13:43:14	8.70E+00	0:00:11	1.21	11.0	1.21	0.0	0.0	0.082462221
13:43:15	8.68E+00	0:00:11	1.19	11.4	1.19	0.0	0.0	0.077258864
13:43:15	8.68E+00	0:00:12	1.19	11.9	1.19	0.0	0.0	0.075911761
13:43:15	8.67E+00	0:00:12	1.18	12.3	1.18	0.0	0.0	0.070628844
13:43:16	8.66E+00	0:00:13	1.17	12.8	1.17	0.0	0.0	0.066624051
13:43:16	8.65E+00	0:00:13	1.16	13.3	1.16	0.0	0.0	0.063933524
13:43:17	8.64E+00	0:00:14	1.15	13.7	1.15	0.0	0.0	0.059828382
13:43:17	8.63E+00	0:00:14	1.14	14.2	1.14	0.0	0.0	0.05709529
13:43:18	8.62E+00	0:00:15	1.13	14.6	1.13	0.0	0.0	0.054344889
13:43:18	8.61E+00	0:00:15	1.12	15.1	1.12	0.0	0.0	0.05018635
13:43:19	8.60E+00	0:00:16	1.12	15.5	1.12	0.0	0.0	0.047391702
13:43:19	8.59E+00	0:00:16	1.10	16.0	1.10	0.0	0.0	0.043126398
13:43:20	**8.59E+00**	**0:00:16**	**1.10**	**16.5**	**1.10**	**0.0**	**0.0**	**0.040285799**
13:43:20	8.57E+00	0:00:17	1.08	16.9	1.08	0.0	0.0	0.034548247
13:43:21	8.57E+00	0:00:17	1.08	17.4	1.08	0.0	0.0	0.031610415
13:43:21	8.55E+00	0:00:18	1.06	17.8	1.06	0.0	0.0	0.027227254
13:43:21	8.55E+00	0:00:18	1.06	18.3	1.06	0.0	0.0	0.024280376
13:43:22	8.54E+00	0:00:19	1.05	18.7	1.05	0.0	0.0	0.021313365
13:43:22	8.53E+00	0:00:19	1.04	19.2	1.04	0.0	0.0	0.016824494
13:43:23	8.52E+00	0:00:20	1.03	19.7	1.03	0.0	0.0	0.013763855
13:43:23	8.51E+00	0:00:20	1.02	20.1	1.02	0.0	0.0	0.009195854
13:43:24	8.51E+00	0:00:21	1.02	20.6	1.02	0.0	0.0	0.007662447
13:43:24	8.50E+00	0:00:21	1.01	21.0	1.01	0.0	0.0	0.004579294
13:43:25	8.49E+00	0:00:22	1.00	21.5	1.00	0.0	0.0	-8.68676E-05
13:43:25	8.48E+00	0:00:22	0.99	21.9	0.99	0.0	0.0	-0.004847623
13:43:26	8.47E+00	0:00:22	0.99	22.4	0.99	0.0	0.0	-0.006431517
13:43:26	8.46E+00	0:00:23	0.97	22.9	0.97	0.0	0.0	-0.012825499
13:43:27	8.44E+00	0:00:24	0.95	24.1	0.95	0.0	0.0	-0.02264227
13:43:28	8.42E+00	0:00:25	0.93	25.1	0.93	0.0	0.0	-0.029281296
13:43:29	8.40E+00	0:00:26	0.91	26.1	0.91	0.0	0.0	-0.039481657
13:43:30	8.40E+00	0:00:27	0.91	27.1	0.91	0.0	0.0	-0.04291974
13:43:31	8.37E+00	0:00:28	0.88	28.1	0.88	0.0	0.0	-0.053400375

Time	MW-6 Slug In Analog#01 mw-6..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:43:32	8.36E+00	0:00:29	0.87	29.1	0.87	0.0	0.0	-0.058786812
13:43:33	8.34E+00	0:00:30	0.86	30.1	0.86	0.0	0.0	-0.067830754
13:43:34	8.33E+00	0:00:31	0.84	31.1	0.84	0.0	0.0	-0.075255648
13:43:35	8.32E+00	0:00:32	0.83	32.1	0.83	0.0	0.0	-0.082757142
13:43:36	8.30E+00	0:00:33	0.81	33.1	0.81	0.0	0.0	-0.09039049
13:43:39	8.27E+00	0:00:35	0.78	35.4	0.78	0.0	0.0	-0.110138279
13:43:39	8.25E+00	0:00:36	0.77	36.1	0.77	0.0	0.0	-0.116281798
13:43:40	8.25E+00	0:00:37	0.76	37.1	0.76	0.0	0.0	-0.120388093
13:43:41	8.23E+00	0:00:38	0.74	38.1	0.74	0.0	0.0	-0.130826973
13:43:42	8.22E+00	0:00:39	0.73	39.1	0.73	0.0	0.0	-0.137272472
13:43:43	8.20E+00	0:00:40	0.71	40.1	0.71	0.0	0.0	-0.145936988
13:43:44	8.20E+00	0:00:41	0.71	41.1	0.71	0.0	0.0	-0.150334945
13:43:45	8.18E+00	0:00:42	0.69	42.1	0.69	0.0	0.0	-0.161591722
13:43:46	8.17E+00	0:00:43	0.68	43.1	0.68	0.0	0.0	-0.168450148
13:43:47	8.16E+00	0:00:44	0.67	44.1	0.67	0.0	0.0	-0.175418624
13:43:48	8.15E+00	0:00:45	0.66	45.1	0.66	0.0	0.0	-0.182500738
13:43:49	8.13E+00	0:00:46	0.64	46.1	0.64	0.0	0.0	-0.192194468
13:43:50	8.12E+00	0:00:47	0.64	47.1	0.64	0.0	0.0	-0.197089511
13:43:51	8.11E+00	0:00:48	0.62	48.1	0.62	0.0	0.0	-0.207048292
13:43:52	8.10E+00	0:00:49	0.61	49.1	0.61	0.0	0.0	-0.217312432
13:43:53	8.09E+00	0:00:50	0.60	50.1	0.60	0.0	0.0	-0.219898809
13:43:54	8.08E+00	0:00:51	0.59	51.1	0.59	0.0	0.0	-0.22775166
13:43:55	8.07E+00	0:00:52	0.58	52.1	0.58	0.0	0.0	-0.235749125
13:43:56	8.06E+00	0:00:53	0.57	53.1	0.57	0.0	0.0	-0.243972787
13:43:57	8.05E+00	0:00:54	0.56	54.1	0.56	0.0	0.0	-0.252277538
13:43:58	8.04E+00	0:00:55	0.55	55.1	0.55	0.0	0.0	-0.257903598
13:43:59	8.03E+00	0:00:56	0.54	56.1	0.54	0.0	0.0	-0.269379202
13:44:00	8.02E+00	0:00:57	0.53	57.1	0.53	0.0	0.0	-0.278271801
13:44:01	8.01E+00	0:00:58	0.52	58.1	0.52	0.0	0.0	-0.284247283
13:44:02	8.00E+00	0:00:59	0.51	59.1	0.51	0.0	0.0	-0.293367549
13:44:03	7.99E+00	0:01:00	0.50	60.1	0.50	0.0	0.0	-0.299555899
13:44:04	7.98E+00	0:01:01	0.49	61.1	0.49	0.0	0.0	-0.309095446
13:44:05	7.98E+00	0:01:02	0.49	62.1	0.49	0.0	0.0	-0.31229272
13:44:06	7.96E+00	0:01:03	0.47	63.1	0.47	0.0	0.0	-0.325322532
13:44:07	7.96E+00	0:01:04	0.47	64.1	0.47	0.0	0.0	-0.331987028
13:44:08	**7.95E+00**	**0:01:05**	**0.46**	**65.1**	**0.46**	**0.0**	**0.0**	**-0.338850143**
13:44:09	7.94E+00	0:01:06	0.45	66.1	0.45	0.0	0.0	-0.345727173
13:44:10	7.93E+00	0:01:07	0.44	67.1	0.44	0.0	0.0	-0.352714855
13:44:11	7.93E+00	0:01:08	0.44	68.1	0.44	0.0	0.0	-0.359816808
13:44:12	7.92E+00	0:01:09	0.43	69.1	0.43	0.0	0.0	-0.367036832
13:44:13	7.91E+00	0:01:10	0.42	70.1	0.42	0.0	0.0	-0.374378919
13:44:14	7.90E+00	0:01:11	0.41	71.1	0.41	0.0	0.0	-0.385735713
13:44:15	7.89E+00	0:01:12	0.40	72.1	0.40	0.0	0.0	-0.393403691
13:44:16	7.89E+00	0:01:13	0.40	73.1	0.40	0.0	0.0	-0.397289055
13:44:17	7.88E+00	0:01:14	0.39	74.1	0.39	0.0	0.0	-0.409158165
13:44:18	7.88E+00	0:01:15	0.39	75.1	0.39	0.0	0.0	-0.413187731
13:44:19	7.87E+00	0:01:16	0.38	76.1	0.38	0.0	0.0	-0.421475395
13:44:20	7.86E+00	0:01:17	0.37	77.1	0.37	0.0	0.0	-0.429807439
13:44:21	7.86E+00	0:01:18	0.37	78.1	0.37	0.0	0.0	-0.434034183
13:44:22	7.85E+00	0:01:19	0.36	79.1	0.36	0.0	0.0	-0.442613118
13:44:24	7.84E+00	0:01:20	0.35	80.4	0.35	0.0	0.0	-0.45136494
13:44:24	7.84E+00	0:01:21	0.35	81.1	0.35	0.0	0.0	-0.455807889
13:44:25	7.83E+00	0:01:22	0.34	82.1	0.34	0.0	0.0	-0.464959187
13:44:26	7.82E+00	0:01:23	0.33	83.2	0.33	0.0	0.0	-0.478861916
13:44:36	7.77E+00	0:01:33	0.28	93.1	0.28	0.0	0.0	-0.550521601

Time	MW-6 Slug In Analog#01 mw-6..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:44:46	7.73E+00	0:01:43	0.24	103.1	0.24	0.0	0.0	-0.623058243
13:44:56	7.69E+00	0:01:53	0.20	113.1	0.20	0.0	0.0	-0.702239489
13:45:06	7.66E+00	0:02:03	0.17	123.1	0.17	0.0	0.0	-0.770574152
13:45:26	7.61E+00	0:02:23	0.12	143.1	0.12	0.0	0.0	-0.924088239
13:45:36	7.59E+00	0:02:33	0.10	153.1	0.10	0.0	0.0	-0.980468315
13:45:46	7.57E+00	0:02:43	0.08	163.1	0.08	0.0	0.0	-1.080921908
13:45:56	7.56E+00	0:02:53	0.07	173.1	0.07	0.0	0.0	-1.142064735
13:46:06	7.55E+00	0:03:03	0.06	183.1	0.06	0.0	0.0	-1.212539525
13:46:16	7.54E+00	0:03:13	0.05	193.1	0.05	0.0	0.0	-1.296708622
13:46:26	7.54E+00	0:03:23	0.05	203.1	0.05	0.0	0.0	-1.328827157
13:46:36	7.53E+00	0:03:33	0.04	213.1	0.04	0.0	0.0	-1.443697499
13:46:46	7.51E+00	0:03:43	0.03	223.1	0.03	0.0	0.0	-1.598599459
13:46:56	7.51E+00	0:03:53	0.02	233.1	0.02	0.0	0.0	-1.665546249
13:47:06	7.51E+00	0:04:03	0.02	243.1	0.02	0.0	0.0	-1.744727495
13:47:16	7.50E+00	0:04:13	0.01	253.1	0.01	0.0	0.0	-1.841637508
13:47:26	7.50E+00	0:04:23	0.01	263.1	0.01	0.0	0.0	-1.966576245
13:47:36	7.50E+00	0:04:33	0.01	273.1	0.01	0.0	0.0	-2.142667504
13:47:46	7.50E+00	0:04:43	0.01	283.1	0.01	0.0	0.0	-2.142667504

Vernon Co. MW-6 Slug Out



06/16/2003

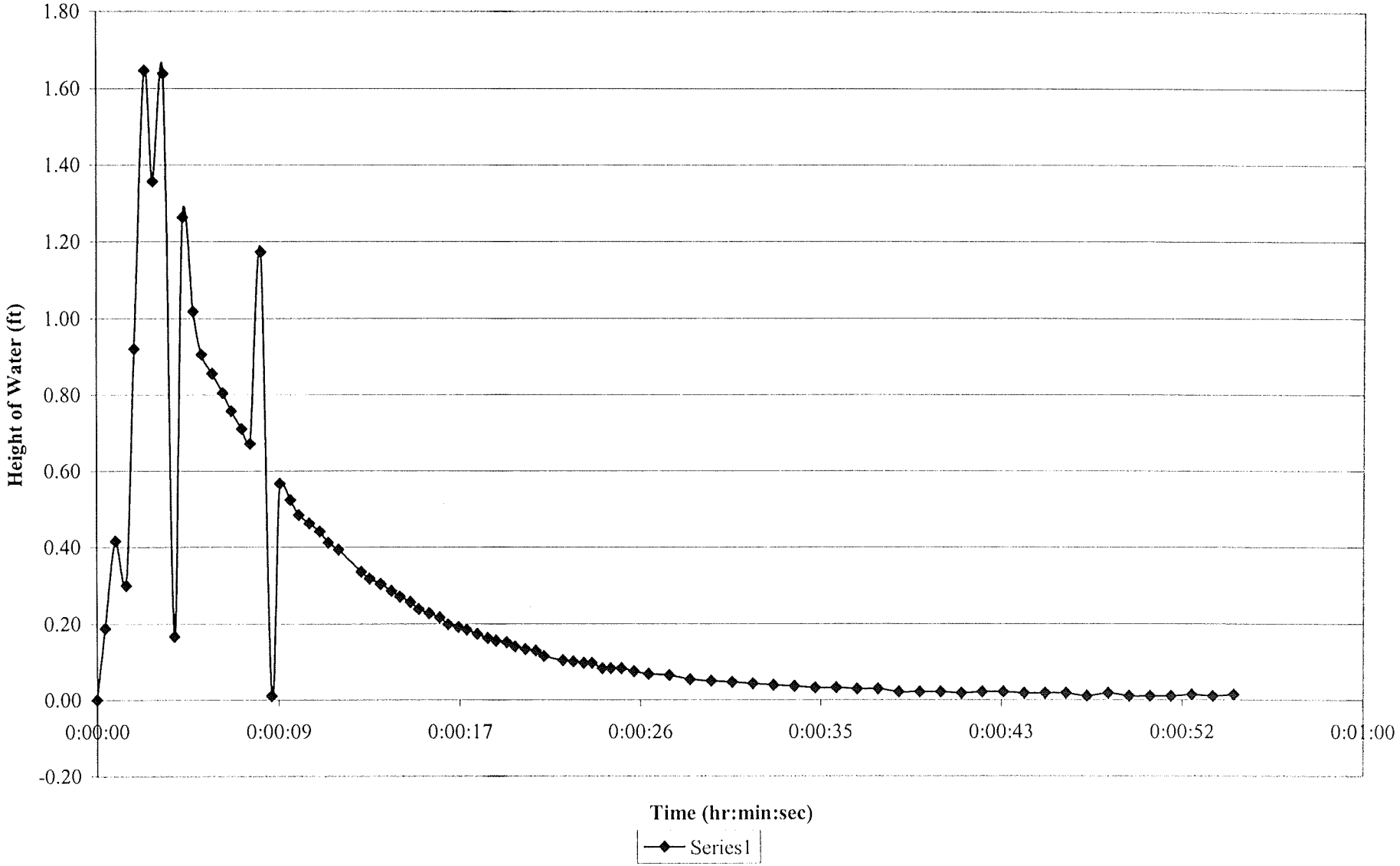
0946W6B.xls MW6b graph

Time	MW-6 Slug Out Analog#01 mw-6..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:51:32	7.46E+00	0:00:00	0.00	0.0	0.00	0.0	0.0	#NUM!
13:51:33	7.28E+00	0:00:00	-0.18	0.4	0.18	0.0	0.0	-0.743522794
13:51:33	7.17E+00	0:00:01	-0.29	0.9	0.29	0.0	0.0	-0.534022632
13:51:34	7.29E+00	0:00:01	-0.17	1.3	0.17	0.0	0.0	-0.761201437
13:51:34	7.30E+00	0:00:02	-0.16	1.8	0.16	0.0	0.0	-0.799149502
13:51:35	6.32E+00	0:00:02	-1.14	2.3	1.14	0.0	0.0	0.057133367
13:51:35	5.85E+00	0:00:03	-1.61	2.7	1.61	0.0	0.0	0.207742053
13:51:36	5.98E+00	0:00:03	-1.48	3.2	1.48	0.0	0.0	0.17023237
13:51:36	6.00E+00	0:00:04	-1.46	3.6	1.46	0.0	0.0	0.163817094
13:51:37	6.02E+00	0:00:04	-1.44	4.1	1.44	0.0	0.0	0.159507037
13:51:37	6.03E+00	0:00:05	-1.43	4.6	1.43	0.0	0.0	0.155123394
13:51:37	6.04E+00	0:00:05	-1.42	5.0	1.42	0.0	0.0	0.15182934
13:51:38	6.07E+00	0:00:06	-1.39	5.5	1.39	0.0	0.0	0.144013466
13:51:38	6.07E+00	0:00:06	-1.39	5.9	1.39	0.0	0.0	0.142889805
13:51:39	6.08E+00	0:00:06	-1.38	6.4	1.38	0.0	0.0	0.139501275
13:51:39	6.09E+00	0:00:07	-1.37	6.9	1.37	0.0	0.0	0.136086097
13:51:40	6.11E+00	0:00:07	-1.35	7.3	1.35	0.0	0.0	0.130301597
13:51:40	6.13E+00	0:00:08	-1.34	7.8	1.34	0.0	0.0	0.125643892
13:51:41	6.14E+00	0:00:08	-1.32	8.2	1.32	0.0	0.0	0.122117536
13:51:41	6.14E+00	0:00:09	-1.32	8.7	1.32	0.0	0.0	0.119717659
13:51:42	6.15E+00	0:00:09	-1.31	9.2	1.31	0.0	0.0	0.116142654
13:51:42	6.17E+00	0:00:10	-1.29	9.6	1.29	0.0	0.0	0.111329737
13:51:42	6.18E+00	0:00:10	-1.28	10.1	1.28	0.0	0.0	0.107650826
13:51:43	6.19E+00	0:00:11	-1.27	10.5	1.27	0.0	0.0	0.103974669
13:51:43	6.20E+00	0:00:11	-1.26	11.0	1.26	0.0	0.0	0.101506496
13:51:44	6.21E+00	0:00:12	-1.25	11.5	1.25	0.0	0.0	0.097777735
13:51:44	6.22E+00	0:00:12	-1.24	11.9	1.24	0.0	0.0	0.093981704
13:51:45	6.23E+00	0:00:12	-1.23	12.4	1.23	0.0	0.0	0.091455913
13:51:45	6.23E+00	0:00:13	-1.23	12.8	1.23	0.0	0.0	0.088915347
13:51:46	6.25E+00	0:00:13	-1.21	13.3	1.21	0.0	0.0	0.083789188
13:51:46	6.26E+00	0:00:14	-1.20	13.8	1.20	0.0	0.0	0.079868335
13:51:47	6.26E+00	0:00:14	-1.20	14.2	1.20	0.0	0.0	0.078565559
13:51:47	6.28E+00	0:00:15	-1.18	14.7	1.18	0.0	0.0	0.071992407
13:51:47	6.29E+00	0:00:15	-1.17	15.1	1.17	0.0	0.0	0.069335035
13:51:48	6.29E+00	0:00:16	-1.17	15.6	1.17	0.0	0.0	0.066624051
13:51:49	6.30E+00	0:00:16	-1.16	16.1	1.16	0.0	0.0	0.063933524
13:51:49	6.32E+00	0:00:16	-1.14	16.5	1.14	0.0	0.0	0.058501943
13:51:49	6.32E+00	0:00:17	-1.14	17.0	1.14	0.0	0.0	0.057133367
13:51:50	6.33E+00	0:00:17	-1.13	17.4	1.13	0.0	0.0	0.054383208
13:51:50	6.35E+00	0:00:18	-1.12	17.9	1.12	0.0	0.0	0.047391702
13:51:51	6.35E+00	0:00:18	-1.11	18.4	1.11	0.0	0.0	0.045987606
13:51:51	6.36E+00	0:00:19	-1.10	18.8	1.10	0.0	0.0	0.041747872
13:51:52	6.37E+00	0:00:19	-1.09	19.3	1.09	0.0	0.0	0.03746634
13:51:52	6.37E+00	0:00:20	-1.09	19.7	1.09	0.0	0.0	0.035989757
13:51:53	6.39E+00	0:00:20	-1.07	20.2	1.07	0.0	0.0	0.030194785
13:51:53	6.40E+00	0:00:21	-1.06	21.1	1.06	0.0	0.0	0.024321442
13:51:54	6.41E+00	0:00:22	-1.05	21.6	1.05	0.0	0.0	0.019822224
13:51:54	6.42E+00	0:00:22	-1.04	22.0	1.04	0.0	0.0	0.015317833
13:51:55	6.43E+00	0:00:22	-1.03	22.5	1.03	0.0	0.0	0.013805927
13:51:55	6.44E+00	0:00:23	-1.02	23.0	1.02	0.0	0.0	0.009238371
13:51:56	6.44E+00	0:00:23	-1.02	23.4	1.02	0.0	0.0	0.009238371
13:51:56	6.45E+00	0:00:24	-1.01	23.9	1.01	0.0	0.0	0.004579294
13:51:57	6.46E+00	0:00:24	-1.00	24.4	1.00	0.0	0.0	-0.001653463
13:51:58	6.49E+00	0:00:26	-0.97	25.9	0.97	0.0	0.0	-0.011173593
13:51:59	6.50E+00	0:00:27	-0.96	26.9	0.96	0.0	0.0	-0.019315026

Time	MW-6 Slug Out Analog#01 mw-6..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:52:00	6.53E+00	0:00:28	-0.93	27.9	0.93	0.0	0.0	-0.029281296
13:52:01	6.54E+00	0:00:29	-0.92	28.9	0.92	0.0	0.0	-0.037725395
13:52:02	6.56E+00	0:00:30	-0.90	29.9	0.90	0.0	0.0	-0.044600913
13:52:03	6.57E+00	0:00:31	-0.89	30.9	0.89	0.0	0.0	-0.049878652
13:52:05	6.58E+00	0:00:32	-0.88	32.2	0.88	0.0	0.0	-0.056950889
13:52:05	6.60E+00	0:00:33	-0.86	32.9	0.86	0.0	0.0	-0.064140202
13:52:06	6.62E+00	0:00:34	-0.84	33.9	0.84	0.0	0.0	-0.075204004
13:52:07	6.63E+00	0:00:35	-0.83	34.9	0.83	0.0	0.0	-0.080817271
13:52:08	6.65E+00	0:00:36	-0.81	35.9	0.81	0.0	0.0	-0.09039049
13:52:09	6.66E+00	0:00:37	-0.80	36.9	0.80	0.0	0.0	-0.098160408
13:52:10	6.67E+00	0:00:38	-0.79	37.9	0.79	0.0	0.0	-0.104080455
13:52:11	6.69E+00	0:00:39	-0.77	38.9	0.77	0.0	0.0	-0.112157735
13:52:12	6.71E+00	0:00:40	-0.75	39.9	0.75	0.0	0.0	-0.12239832
13:52:13	6.72E+00	0:00:41	-0.74	40.9	0.74	0.0	0.0	-0.128660619
13:52:14	6.73E+00	0:00:42	-0.73	41.9	0.73	0.0	0.0	-0.137212902
13:52:15	6.73E+00	0:00:43	-0.73	42.9	0.73	0.0	0.0	-0.137212902
13:52:16	6.75E+00	0:00:44	-0.71	43.9	0.71	0.0	0.0	-0.150273556
13:52:17	6.76E+00	0:00:45	-0.70	44.9	0.70	0.0	0.0	-0.154777894
13:52:18	6.78E+00	0:00:46	-0.68	45.9	0.68	0.0	0.0	-0.168386145
13:52:19	6.79E+00	0:00:47	-0.67	46.9	0.67	0.0	0.0	-0.173018663
13:52:20	6.80E+00	0:00:48	-0.66	47.9	0.66	0.0	0.0	-0.182500738
13:52:21	6.81E+00	0:00:49	-0.65	48.9	0.65	0.0	0.0	-0.187287133
13:52:22	6.83E+00	0:00:50	-0.64	49.9	0.64	0.0	0.0	-0.197021145
13:52:23	6.84E+00	0:00:51	-0.62	50.9	0.62	0.0	0.0	-0.204537106
13:52:24	6.85E+00	0:00:52	-0.61	51.9	0.61	0.0	0.0	-0.212114649
13:52:25	6.85E+00	0:00:53	-0.61	52.9	0.61	0.0	0.0	-0.217240807
13:52:26	6.87E+00	0:00:54	-0.59	53.9	0.59	0.0	0.0	-0.227678293
13:52:27	6.88E+00	0:00:55	-0.58	54.9	0.58	0.0	0.0	-0.233066906
13:52:28	6.89E+00	0:00:56	-0.57	55.9	0.57	0.0	0.0	-0.243896628
13:52:29	6.90E+00	0:00:57	-0.56	56.9	0.56	0.0	0.0	-0.252199909
13:52:30	6.91E+00	0:00:58	-0.55	57.9	0.55	0.0	0.0	-0.260744197
13:52:31	6.92E+00	0:00:59	-0.54	58.9	0.54	0.0	0.0	-0.266481749
13:52:32	6.93E+00	0:01:00	-0.53	59.9	0.53	0.0	0.0	-0.275232754
13:52:33	6.93E+00	0:01:01	-0.53	60.9	0.53	0.0	0.0	-0.278189385
13:52:34	6.95E+00	0:01:02	-0.51	61.9	0.51	0.0	0.0	-0.293367549
13:52:35	**6.96E+00**	**0:01:03**	**-0.50**	**62.9**	**0.50**	**0.0**	**0.0**	**-0.299555899**
13:52:36	6.97E+00	0:01:04	-0.49	63.9	0.49	0.0	0.0	-0.305833704
13:52:37	6.97E+00	0:01:05	-0.49	64.9	0.49	0.0	0.0	-0.309006968
13:52:38	6.98E+00	0:01:06	-0.48	65.9	0.48	0.0	0.0	-0.321937095
13:52:39	6.99E+00	0:01:07	-0.47	66.9	0.47	0.0	0.0	-0.325322532
13:52:40	7.00E+00	0:01:08	-0.46	67.9	0.46	0.0	0.0	-0.335358024
13:52:41	7.00E+00	0:01:09	-0.46	68.9	0.46	0.0	0.0	-0.338755391
13:52:42	7.01E+00	0:01:10	-0.45	69.9	0.45	0.0	0.0	-0.349109922
13:52:44	7.02E+00	0:01:12	-0.44	71.9	0.44	0.0	0.0	-0.35971737
13:52:45	7.04E+00	0:01:13	-0.42	72.9	0.42	0.0	0.0	-0.374378919
13:52:46	7.04E+00	0:01:14	-0.42	73.9	0.42	0.0	0.0	-0.378097039
13:52:47	7.06E+00	0:01:15	-0.40	74.9	0.40	0.0	0.0	-0.393296259
13:52:48	7.06E+00	0:01:16	-0.40	75.9	0.40	0.0	0.0	-0.393296259
13:52:50	7.07E+00	0:01:17	-0.39	77.2	0.39	0.0	0.0	-0.409158165
13:52:50	7.07E+00	0:01:18	-0.39	77.9	0.39	0.0	0.0	-0.413187731
13:52:51	7.0744	0:01:19	-0.39	78.9	0.39	0.0	0.0	-0.413187731
13:52:52	7.0816	0:01:20	-0.38	79.9	0.38	0.0	0.0	-0.42136079
13:52:53	7.0924	0:01:21	-0.37	80.9	0.37	0.0	0.0	-0.433916216
13:52:54	7.1033	0:01:22	-0.36	81.9	0.36	0.0	0.0	-0.446966984
13:52:55	7.096	0:01:23	-0.36	82.9	0.36	0.0	0.0	-0.438183336

Time	MW-6 Slug Out Analog#01 mw-6..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:52:56	7.1105	0:01:24	-0.35	83.9	0.35	0.0	0.0	-0.455807889
13:52:57	7.1177	0:01:25	-0.34	85.0	0.34	0.0	0.0	-0.464832515
13:53:07	7.1754	0:01:35	-0.29	94.9	0.29	0.0	0.0	-0.544850479
13:53:17	7.2188	0:01:45	-0.24	104.9	0.24	0.0	0.0	-0.616543703
13:53:27	7.2621	0:01:55	-0.20	114.9	0.20	0.0	0.0	-0.702239489
13:53:37	7.3018	0:02:05	-0.16	124.9	0.16	0.0	0.0	-0.799149502
13:53:47	7.327	0:02:15	-0.13	134.9	0.13	0.0	0.0	-0.874193542
13:53:57	7.3487	0:02:25	-0.11	144.9	0.11	0.0	0.0	-0.951169913
13:54:07	7.3703	0:02:35	-0.09	154.9	0.09	0.0	0.0	-1.04431225
13:54:17	7.3884	0:02:45	-0.07	164.9	0.07	0.0	0.0	-1.141462802
13:54:27	7.4028	0:02:55	-0.06	174.9	0.06	0.0	0.0	-1.238072162
13:54:37	7.41	0:03:05	-0.05	184.9	0.05	0.0	0.0	-1.295849483
13:54:47	7.4245	0:03:15	-0.04	194.9	0.04	0.0	0.0	-1.442492798
13:54:57	7.4353	0:03:25	-0.03	204.9	0.03	0.0	0.0	-1.596879479
13:55:07	7.4425	0:03:35	-0.02	214.9	0.02	0.0	0.0	-1.742321425
13:55:17	7.4461	0:03:45	-0.01	224.9	0.01	0.0	0.0	-1.838631998

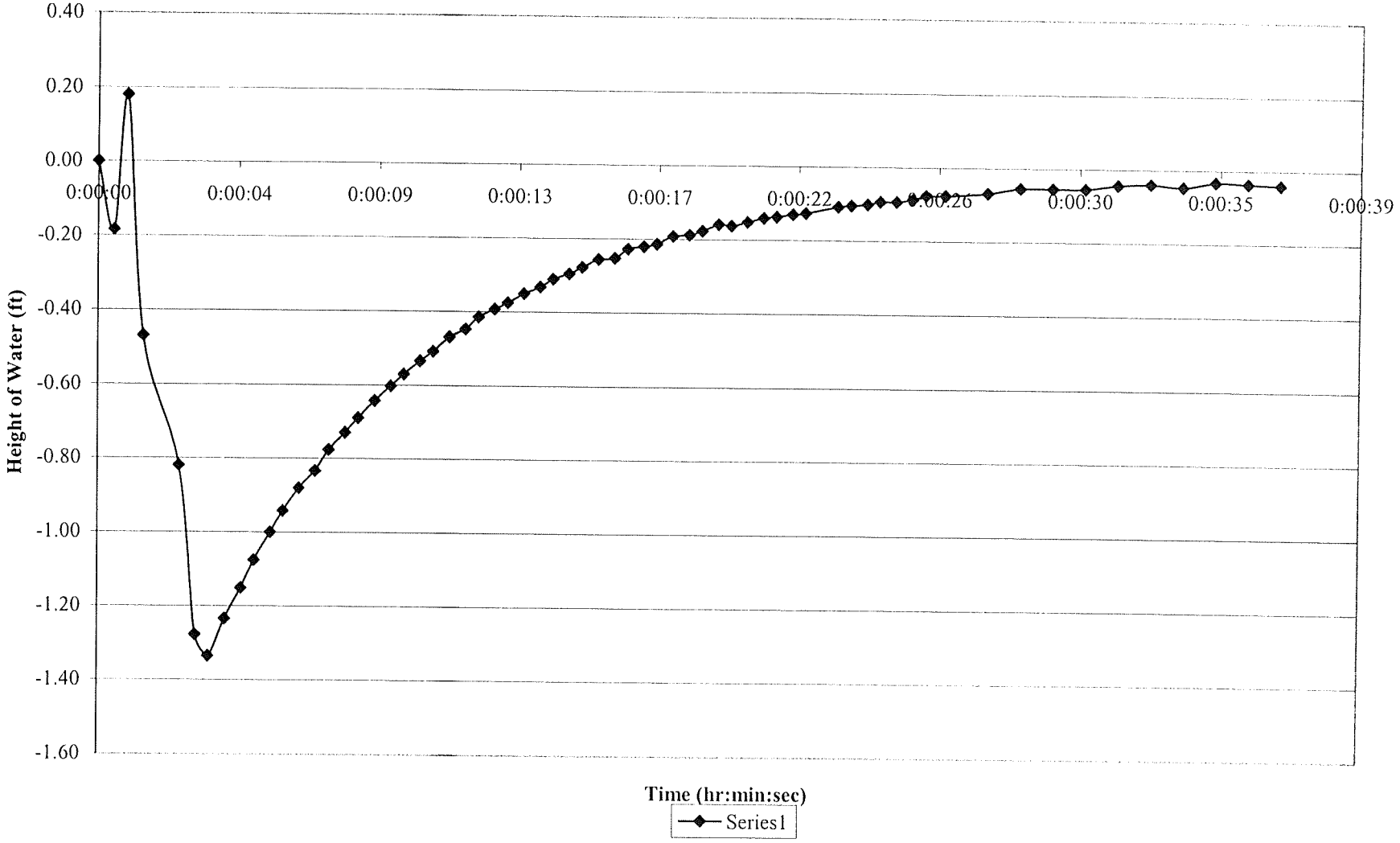
Vernon Co. MW-7 Slug In



Time	MW-7 Slug IN Analog#01 MW-7 ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
43:32.0	7.05E+00	0:00:00	0.00	0.0	0.00	0.0	0.0	#NUM!
43:32.4	7.24E+00	0:00:00	0.19	0.4	0.19	0.0	0.0	-0.726535727
43:32.9	7.46E+00	0:00:01	0.42	0.9	0.42	0.0	0.0	-0.381847267
43:33.4	7.35E+00	0:00:01	0.30	1.4	0.30	0.0	0.0	-0.523458191
43:33.8	7.97E+00	0:00:02	0.92	1.8	0.92	0.0	0.0	-0.03602339
43:34.3	8.70E+00	0:00:02	1.65	2.3	1.65	0.0	0.0	0.216403445
43:34.7	8.41E+00	0:00:03	1.36	2.7	1.36	0.0	0.0	0.13261185
43:35.2	8.69E+00	0:00:03	1.64	3.2	1.64	0.0	0.0	0.214499454
43:35.7	7.22E+00	0:00:04	0.17	3.7	0.17	0.0	0.0	-0.779891912
43:36.1	8.31E+00	0:00:04	1.26	4.1	1.26	0.0	0.0	0.101506496
43:36.6	8.07E+00	0:00:05	1.02	4.6	1.02	0.0	0.0	0.007705114
43:37.0	7.96E+00	0:00:05	0.91	5.0	0.91	0.0	0.0	-0.042871802
43:37.5	7.90E+00	0:00:06	0.86	5.5	0.86	0.0	0.0	-0.067830754
43:38.0	7.85E+00	0:00:06	0.80	6.0	0.80	0.0	0.0	-0.094258073
43:38.4	7.81E+00	0:00:06	0.76	6.4	0.76	0.0	0.0	-0.120330794
43:38.9	7.76E+00	0:00:07	0.71	6.9	0.71	0.0	0.0	-0.148069321
43:39.3	7.72E+00	0:00:07	0.67	7.3	0.67	0.0	0.0	-0.173018663
43:39.8	8.22E+00	0:00:08	1.17	7.8	1.17	0.0	0.0	0.069335035
43:40.3	7.06E+00	0:00:08	0.01	8.3	0.01	0.0	0.0	-1.966576245
43:40.7	7.62E+00	0:00:09	0.57	8.7	0.57	0.0	0.0	-0.246646787
43:41.2	7.57E+00	0:00:09	0.52	9.2	0.52	0.0	0.0	-0.281166282
43:41.6	7.53E+00	0:00:10	0.48	9.6	0.48	0.0	0.0	-0.315423913
43:42.1	7.51E+00	0:00:10	0.46	10.1	0.46	0.0	0.0	-0.335358024
43:42.6	7.49E+00	0:00:11	0.44	10.6	0.44	0.0	0.0	-0.35615269
43:43.0	7.46E+00	0:00:11	0.41	11.0	0.41	0.0	0.0	-0.38563016
43:43.5	7.44E+00	0:00:12	0.39	11.5	0.39	0.0	0.0	-0.405165644
43:44.6	7.38E+00	0:00:13	0.34	12.6	0.34	0.0	0.0	-0.474048659
43:45.0	7.37E+00	0:00:13	0.32	13.0	0.32	0.0	0.0	-0.498119506
43:45.5	7.35E+00	0:00:13	0.30	13.5	0.30	0.0	0.0	-0.518270803
43:46.0	7.33E+00	0:00:14	0.29	14.0	0.29	0.0	0.0	-0.544850479
43:46.4	7.32E+00	0:00:14	0.27	14.4	0.27	0.0	0.0	-0.567511744
43:46.9	7.31E+00	0:00:15	0.26	14.9	0.26	0.0	0.0	-0.591251394
43:47.3	7.29E+00	0:00:15	0.24	15.3	0.24	0.0	0.0	-0.623058243
43:47.8	7.28E+00	0:00:16	0.23	15.8	0.23	0.0	0.0	-0.64320954
43:48.3	7.27E+00	0:00:16	0.22	16.3	0.22	0.0	0.0	-0.664341548
43:48.7	7.25E+00	0:00:17	0.20	16.7	0.20	0.0	0.0	-0.702239489
43:49.2	7.24E+00	0:00:17	0.19	17.2	0.19	0.0	0.0	-0.71828503
43:49.6	7.23E+00	0:00:18	0.18	17.6	0.18	0.0	0.0	-0.734946211
43:50.1	7.22E+00	0:00:18	0.17	18.1	0.17	0.0	0.0	-0.761201437
43:50.6	7.21E+00	0:00:19	0.16	18.6	0.16	0.0	0.0	-0.789413975
43:51.0	7.20E+00	0:00:19	0.16	19.0	0.16	0.0	0.0	-0.809108283
43:51.5	7.20E+00	0:00:19	0.15	19.5	0.15	0.0	0.0	-0.819300799
43:51.9	7.19E+00	0:00:20	0.14	19.9	0.14	0.0	0.0	-0.851397345
43:52.4	7.18E+00	0:00:20	0.13	20.4	0.13	0.0	0.0	-0.874193542
43:52.9	7.18E+00	0:00:21	0.13	20.9	0.13	0.0	0.0	-0.886390849
43:53.3	7.16E+00	0:00:21	0.12	21.3	0.12	0.0	0.0	-0.937418016
43:54.2	7.15E+00	0:00:22	0.10	22.2	0.10	0.0	0.0	-0.980053318
43:54.7	7.15E+00	0:00:23	0.10	22.7	0.10	0.0	0.0	-0.995248844
43:55.2	7.15E+00	0:00:23	0.10	23.2	0.10	0.0	0.0	-1.010995384
43:55.6	7.15E+00	0:00:24	0.10	23.6	0.10	0.0	0.0	-1.010995384
43:56.1	7.13E+00	0:00:24	0.08	24.1	0.08	0.0	0.0	-1.080921908
43:56.5	7.13E+00	0:00:25	0.08	24.5	0.08	0.0	0.0	-1.080921908
43:57.0	7.13E+00	0:00:25	0.08	25.0	0.08	0.0	0.0	-1.080921908
43:57.6	7.12E+00	0:00:26	0.08	25.6	0.08	0.0	0.0	-1.120330794
43:58.3	7.12E+00	0:00:26	0.07	26.3	0.07	0.0	0.0	-1.163675884

Time	MW-7 Slug IN Analog#01 MW-7 ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
43:59.3	7.11E+00	0:00:27	0.06	27.3	0.06	0.0	0.0	-1.187086643
44:00.3	7.10E+00	0:00:28	0.05	28.3	0.05	0.0	0.0	-1.266000713
44:01.3	7.10E+00	0:00:29	0.05	29.3	0.05	0.0	0.0	-1.296708622
44:02.3	7.10E+00	0:00:30	0.05	30.3	0.05	0.0	0.0	-1.328827157
44:03.3	7.09E+00	0:00:31	0.04	31.3	0.04	0.0	0.0	-1.363512104
44:04.3	7.09E+00	0:00:32	0.04	32.3	0.04	0.0	0.0	-1.401209493
44:05.3	7.09E+00	0:00:33	0.04	33.3	0.04	0.0	0.0	-1.442492798
44:06.3	7.08E+00	0:00:34	0.03	34.3	0.03	0.0	0.0	-1.488116639
44:07.3	7.08E+00	0:00:35	0.03	35.3	0.03	0.0	0.0	-1.488116639
44:08.3	7.08E+00	0:00:36	0.03	36.3	0.03	0.0	0.0	-1.539102157
44:09.3	7.08E+00	0:00:37	0.03	37.3	0.03	0.0	0.0	-1.539102157
44:10.3	7.07E+00	0:00:38	0.02	38.3	0.02	0.0	0.0	-1.663540266

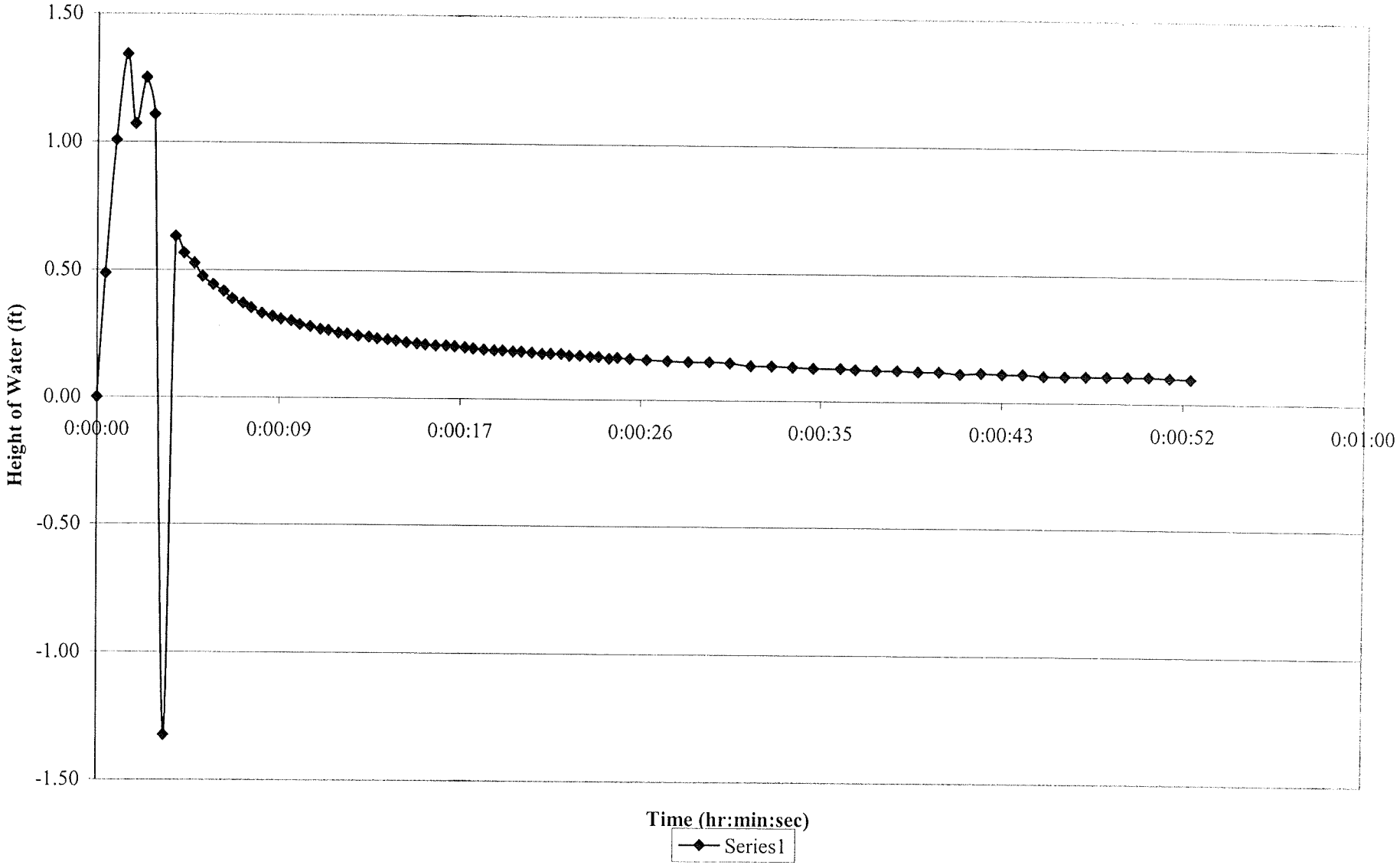
Vernon Co. MW-7 Slug Out



Time	MW-7 Slug Out Analog#01 MW-7 ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
48:33.9	7.05E+00	0:00:00	0.00	0.0	0.00	0.0	0.0	#NUM!
48:34.4	6.87E+00	0:00:00	-0.18	0.5	0.18	0.0	0.0	-0.73495
48:34.8	7.23E+00	0:00:01	0.18	0.9	0.18	0.0	0.0	-0.74352
48:35.3	6.58E+00	0:00:01	-0.47	1.4	0.47	0.0	0.0	-0.32864
48:36.4	6.23E+00	0:00:02	-0.82	2.5	0.82	0.0	0.0	-0.08656
48:36.9	5.78E+00	0:00:03	-1.28	3.0	1.28	0.0	0.0	0.106429
48:37.3	5.72E+00	0:00:03	-1.34	3.4	1.34	0.0	0.0	0.125611
48:37.8	5.82E+00	0:00:04	-1.23	3.9	1.23	0.0	0.0	0.091456
48:38.3	5.90E+00	0:00:04	-1.15	4.4	1.15	0.0	0.0	0.061226
48:38.7	5.98E+00	0:00:05	-1.08	4.8	1.08	0.0	0.0	0.031651
48:39.2	6.05E+00	0:00:05	-1.00	5.3	1.00	0.0	0.0	-8.7E-05
48:39.6	6.11E+00	0:00:06	-0.94	5.7	0.94	0.0	0.0	-0.02595
48:40.1	6.17E+00	0:00:06	-0.88	6.2	0.88	0.0	0.0	-0.05517
48:40.6	6.22E+00	0:00:07	-0.83	6.7	0.83	0.0	0.0	-0.07899
48:41.0	6.28E+00	0:00:07	-0.78	7.1	0.78	0.0	0.0	-0.11014
48:41.5	6.32E+00	0:00:08	-0.73	7.6	0.73	0.0	0.0	-0.13721
48:41.9	6.36E+00	0:00:08	-0.69	8.0	0.69	0.0	0.0	-0.16153
48:42.4	6.41E+00	0:00:08	-0.64	8.5	0.64	0.0	0.0	-0.19219
48:42.9	6.45E+00	0:00:09	-0.60	9.0	0.60	0.0	0.0	-0.2199
48:43.3	6.48E+00	0:00:09	-0.57	9.4	0.57	0.0	0.0	-0.2439
48:43.8	6.52E+00	0:00:10	-0.53	9.9	0.53	0.0	0.0	-0.2723
48:44.2	6.54E+00	0:00:10	-0.51	10.3	0.51	0.0	0.0	-0.29337
48:44.7	6.58E+00	0:00:11	-0.47	10.8	0.47	0.0	0.0	-0.32864
48:45.2	6.61E+00	0:00:11	-0.45	11.3	0.45	0.0	0.0	-0.34921
48:45.6	6.64E+00	0:00:12	-0.42	11.7	0.42	0.0	0.0	-0.38185
48:46.1	6.66E+00	0:00:12	-0.39	12.2	0.39	0.0	0.0	-0.40517
48:46.5	6.68E+00	0:00:13	-0.38	12.6	0.38	0.0	0.0	-0.42551
48:47.0	6.70E+00	0:00:13	-0.35	13.1	0.35	0.0	0.0	-0.45581
48:47.5	6.72E+00	0:00:14	-0.33	13.6	0.33	0.0	0.0	-0.47886
48:47.9	6.74E+00	0:00:14	-0.31	14.0	0.31	0.0	0.0	-0.50808
48:48.4	6.76E+00	0:00:14	-0.30	14.5	0.30	0.0	0.0	-0.52886
48:48.8	6.77E+00	0:00:15	-0.28	14.9	0.28	0.0	0.0	-0.55611
48:49.3	6.80E+00	0:00:15	-0.26	15.4	0.26	0.0	0.0	-0.59142
48:49.8	6.80E+00	0:00:16	-0.25	15.9	0.25	0.0	0.0	-0.59757
48:50.2	6.83E+00	0:00:16	-0.23	16.3	0.23	0.0	0.0	-0.64321
48:50.7	6.83E+00	0:00:17	-0.22	16.8	0.22	0.0	0.0	-0.65718
48:51.1	6.84E+00	0:00:17	-0.21	17.2	0.21	0.0	0.0	-0.67182
48:51.6	6.86E+00	0:00:18	-0.19	17.7	0.19	0.0	0.0	-0.71829
48:52.1	6.87E+00	0:00:18	-0.19	18.2	0.19	0.0	0.0	-0.72654
48:52.5	6.88E+00	0:00:19	-0.18	18.6	0.18	0.0	0.0	-0.75252
48:53.0	6.89E+00	0:00:19	-0.16	19.1	0.16	0.0	0.0	-0.79915
48:53.4	6.89E+00	0:00:19	-0.16	19.5	0.16	0.0	0.0	-0.78941
48:53.9	6.90E+00	0:00:20	-0.15	20.0	0.15	0.0	0.0	-0.8193
48:54.4	6.91E+00	0:00:20	-0.14	20.5	0.14	0.0	0.0	-0.85171
48:54.8	6.92E+00	0:00:21	-0.14	20.9	0.14	0.0	0.0	-0.86296
48:55.3	6.92E+00	0:00:21	-0.13	21.4	0.13	0.0	0.0	-0.88639
48:55.7	6.93E+00	0:00:22	-0.13	21.8	0.13	0.0	0.0	-0.8986
48:56.7	6.94E+00	0:00:23	-0.11	22.8	0.11	0.0	0.0	-0.96537
48:57.1	6.95E+00	0:00:23	-0.10	23.2	0.10	0.0	0.0	-0.98005
48:57.6	6.95E+00	0:00:24	-0.10	23.7	0.10	0.0	0.0	-0.99568
48:58.0	6.96E+00	0:00:24	-0.09	24.1	0.09	0.0	0.0	-1.0278
48:58.5	6.96E+00	0:00:25	-0.09	24.6	0.09	0.0	0.0	-1.0278
48:59.0	6.97E+00	0:00:25	-0.09	25.1	0.09	0.0	0.0	-1.06248
48:59.4	6.98E+00	0:00:25	-0.08	25.5	0.08	0.0	0.0	-1.12033
49:00.0	6.98E+00	0:00:26	-0.08	26.1	0.08	0.0	0.0	-1.12033

Time	MW-7 Slug Out Analog#01 MW-7 ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
49:01.3	6.98E+00	0:00:27	-0.07	27.4	0.07	0.0	0.0	-1.16368
49:02.3	7.00E+00	0:00:28	-0.05	28.4	0.05	0.0	0.0	-1.2668
49:03.3	7.00E+00	0:00:29	-0.05	29.4	0.05	0.0	0.0	-1.2668
49:04.3	7.00E+00	0:00:30	-0.05	30.4	0.05	0.0	0.0	-1.2668
49:05.3	7.01E+00	0:00:31	-0.04	31.4	0.04	0.0	0.0	-1.36351
49:06.3	7.01E+00	0:00:32	-0.04	32.4	0.04	0.0	0.0	-1.40121
49:07.3	7.01E+00	0:00:33	-0.05	33.4	0.05	0.0	0.0	-1.32883
49:08.3	7.02E+00	0:00:34	-0.03	34.4	0.03	0.0	0.0	-1.48812
49:09.3	7.02E+00	0:00:35	-0.04	35.4	0.04	0.0	0.0	-1.44249
49:10.3	7.01E+00	0:00:36	-0.04	36.4	0.04	0.0	0.0	-1.40121
49:11.3	7.03E+00	0:00:37	-0.03	37.4	0.03	0.0	0.0	-1.5986
49:12.3	7.02E+00	0:00:38	-0.03	38.4	0.03	0.0	0.0	-1.5391
49:13.3	7.02E+00	0:00:39	-0.03	39.4	0.03	0.0	0.0	-1.48812
49:14.3	7.02E+00	0:00:40	-0.04	40.4	0.04	0.0	0.0	-1.44249
49:15.3	7.02E+00	0:00:41	-0.03	41.4	0.03	0.0	0.0	-1.48812
49:16.3	7.03E+00	0:00:42	-0.03	42.4	0.03	0.0	0.0	-1.5986
49:17.3	7.03E+00	0:00:43	-0.03	43.4	0.03	0.0	0.0	-1.5986
49:18.3	7.02E+00	0:00:44	-0.03	44.4	0.03	0.0	0.0	-1.5391
49:19.6	7.03E+00	0:00:46	-0.03	45.7	0.03	0.0	0.0	-1.5986
49:20.3	7.03E+00	0:00:46	-0.03	46.4	0.03	0.0	0.0	-1.5986
49:21.3	7.03E+00	0:00:47	-0.03	47.4	0.03	0.0	0.0	-1.5986
49:22.3	7.03E+00	0:00:48	-0.02	48.4	0.02	0.0	0.0	-1.74473
49:23.3	7.03E+00	0:00:49	-0.03	49.4	0.03	0.0	0.0	-1.5986
49:24.3	7.03E+00	0:00:50	-0.02	50.4	0.02	0.0	0.0	-1.66555
49:25.3	7.03E+00	0:00:51	-0.03	51.4	0.03	0.0	0.0	-1.5986
49:26.3	7.03E+00	0:00:52	-0.02	52.4	0.02	0.0	0.0	-1.66555
49:27.3	7.03E+00	0:00:53	-0.02	53.4	0.02	0.0	0.0	-1.66555
49:28.3	7.03E+00	0:00:54	-0.02	54.4	0.02	0.0	0.0	-1.66555
49:29.3	7.03E+00	0:00:55	-0.03	55.4	0.03	0.0	0.0	-1.5986
49:30.3	7.03E+00	0:00:56	-0.03	56.4	0.03	0.0	0.0	-1.5986
49:31.3	7.03E+00	0:00:57	-0.02	57.4	0.02	0.0	0.0	-1.74473
49:32.3	7.03E+00	0:00:58	-0.02	58.4	0.02	0.0	0.0	-1.74473
49:33.3	7.03E+00	0:00:59	-0.02	59.4	0.02	0.0	0.0	-1.66555
49:34.3	7.03E+00	0:01:00	-0.02	60.4	0.02	0.0	0.0	-1.66555
49:35.3	7.03E+00	0:01:01	-0.02	61.4	0.02	0.0	0.0	-1.66555
49:36.3	7.03E+00	0:01:02	-0.02	62.4	0.02	0.0	0.0	-1.74473
49:37.3	7.03E+00	0:01:03	-0.03	63.4	0.03	0.0	0.0	-1.5986
49:38.3	7.03E+00	0:01:04	-0.02	64.4	0.02	0.0	0.0	-1.74473
49:39.3	7.03E+00	0:01:05	-0.02	65.4	0.02	0.0	0.0	-1.66555

Vernon Co. MW-8R Slug In



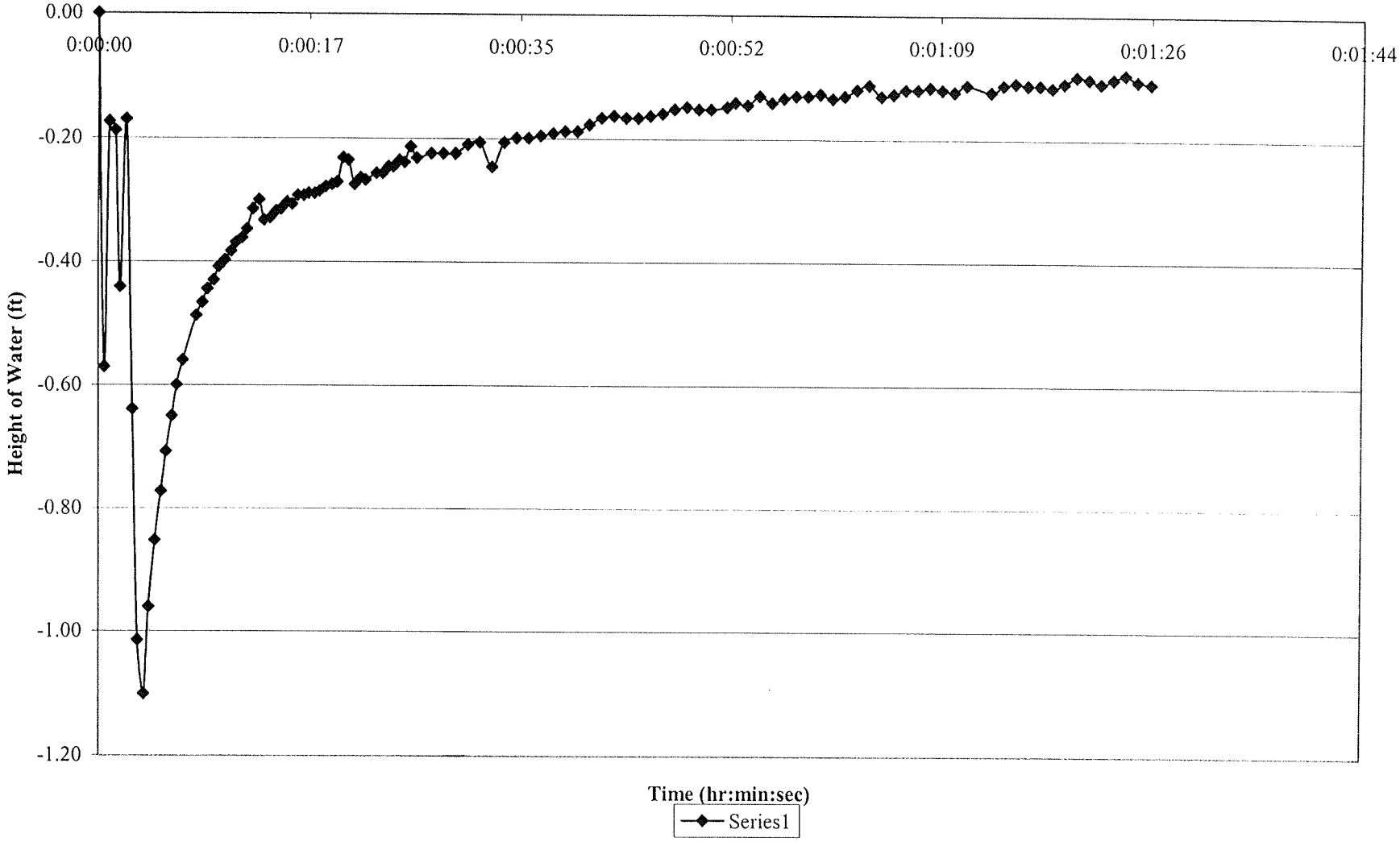
06/13/2003

0946w8ra.xls MW8ra graph

Time	MW-8R Slug In Analog#01 MW-8R ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
13:41.1	7.15E+00	0:00:00	0.00	0.0	0.00	0.0	0.0	#NUM!
13:41.5	7.64E+00	0:00:00	0.49	0.4	0.49	0.0	0.0	-0.312293
13:42.0	8.16E+00	0:00:01	1.01	0.9	1.01	0.0	0.0	0.0030295
13:42.5	8.49E+00	0:00:01	1.34	1.4	1.34	0.0	0.0	0.127979
13:42.9	8.22E+00	0:00:02	1.07	1.8	1.07	0.0	0.0	0.0301948
13:43.4	8.40E+00	0:00:02	1.25	2.3	1.25	0.0	0.0	0.0977431
13:43.8	8.26E+00	0:00:03	1.11	2.7	1.11	0.0	0.0	0.044579
13:44.3	5.83E+00	0:00:03	-1.32	3.2	1.32	0.0	0.0	0.1221175
13:44.8	7.78E+00	0:00:04	0.63	3.7	0.63	0.0	0.0	-0.199558
13:45.2	7.72E+00	0:00:04	0.57	4.1	0.57	0.0	0.0	-0.246723
13:45.7	7.68E+00	0:00:05	0.53	4.6	0.53	0.0	0.0	-0.278272
13:46.1	7.63E+00	0:00:05	0.48	5.0	0.48	0.0	0.0	-0.322028
13:46.6	7.59E+00	0:00:06	0.44	5.5	0.44	0.0	0.0	-0.352715
13:47.1	7.57E+00	0:00:06	0.42	6.0	0.42	0.0	0.0	-0.378097
13:47.5	7.54E+00	0:00:06	0.39	6.4	0.39	0.0	0.0	-0.409158
13:48.0	7.52E+00	0:00:07	0.37	6.9	0.37	0.0	0.0	-0.429807
13:48.4	7.50E+00	0:00:07	0.35	7.3	0.35	0.0	0.0	-0.451365
13:48.9	7.48E+00	0:00:08	0.33	7.8	0.33	0.0	0.0	-0.478862
13:49.4	7.47E+00	0:00:08	0.32	8.3	0.32	0.0	0.0	-0.493224
13:49.8	7.46E+00	0:00:09	0.31	8.7	0.31	0.0	0.0	-0.508078
13:50.3	7.45E+00	0:00:09	0.30	9.2	0.30	0.0	0.0	-0.518271
13:50.7	7.44E+00	0:00:10	0.29	9.6	0.29	0.0	0.0	-0.539553
13:51.2	7.43E+00	0:00:10	0.28	10.1	0.28	0.0	0.0	-0.550522
13:51.7	7.42E+00	0:00:11	0.27	10.6	0.27	0.0	0.0	-0.567512
13:52.1	7.42E+00	0:00:11	0.27	11.0	0.27	0.0	0.0	-0.573326
13:52.6	7.41E+00	0:00:12	0.26	11.5	0.26	0.0	0.0	-0.591421
13:53.0	7.40E+00	0:00:12	0.25	11.9	0.25	0.0	0.0	-0.597567
13:53.5	7.40E+00	0:00:12	0.25	12.4	0.25	0.0	0.0	-0.610125
13:54.0	7.39E+00	0:00:13	0.24	12.9	0.24	0.0	0.0	-0.616544
13:54.4	7.38E+00	0:00:13	0.23	13.3	0.23	0.0	0.0	-0.629672
13:54.9	7.38E+00	0:00:14	0.23	13.8	0.23	0.0	0.0	-0.636388
13:55.3	7.38E+00	0:00:14	0.23	14.2	0.23	0.0	0.0	-0.64321
13:55.8	7.37E+00	0:00:15	0.22	14.7	0.22	0.0	0.0	-0.65738
13:56.3	7.37E+00	0:00:15	0.22	15.2	0.22	0.0	0.0	-0.664542
13:56.7	7.36E+00	0:00:16	0.21	15.6	0.21	0.0	0.0	-0.671824
13:57.2	7.36E+00	0:00:16	0.21	16.1	0.21	0.0	0.0	-0.679231
13:57.7	7.36E+00	0:00:17	0.21	16.6	0.21	0.0	0.0	-0.679231
13:58.1	7.36E+00	0:00:17	0.21	17.0	0.21	0.0	0.0	-0.686766
13:58.6	7.35E+00	0:00:17	0.20	17.5	0.20	0.0	0.0	-0.694434
13:59.0	7.35E+00	0:00:18	0.20	17.9	0.20	0.0	0.0	-0.702239
13:59.5	7.35E+00	0:00:18	0.19	18.4	0.19	0.0	0.0	-0.710188
14:00.0	7.34E+00	0:00:19	0.19	18.9	0.19	0.0	0.0	-0.718285
14:00.4	7.34E+00	0:00:19	0.19	19.3	0.19	0.0	0.0	-0.718285
14:00.9	7.34E+00	0:00:20	0.19	19.8	0.19	0.0	0.0	-0.726536
14:01.3	7.34E+00	0:00:20	0.19	20.2	0.19	0.0	0.0	-0.726536
14:01.8	7.33E+00	0:00:21	0.18	20.7	0.18	0.0	0.0	-0.734946
14:02.3	7.33E+00	0:00:21	0.18	21.2	0.18	0.0	0.0	-0.743763
14:02.7	7.33E+00	0:00:22	0.18	21.6	0.18	0.0	0.0	-0.743763
14:03.2	7.33E+00	0:00:22	0.18	22.1	0.18	0.0	0.0	-0.743763
14:03.6	7.32E+00	0:00:22	0.17	22.5	0.17	0.0	0.0	-0.761452
14:04.1	7.32E+00	0:00:23	0.17	23.0	0.17	0.0	0.0	-0.761452
14:04.6	7.32E+00	0:00:23	0.17	23.5	0.17	0.0	0.0	-0.770574
14:05.0	7.32E+00	0:00:24	0.17	23.9	0.17	0.0	0.0	-0.770574
14:05.5	7.31E+00	0:00:24	0.16	24.4	0.16	0.0	0.0	-0.789414
14:05.9	7.32E+00	0:00:25	0.17	24.8	0.17	0.0	0.0	-0.779892

Time	MW-8R Slug In Analog#01 MW-8R ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
14:06.5	7.31E+00	0:00:25	0.16	25.4	0.16	0.0	0.0	-0.789414
14:07.3	7.31E+00	0:00:26	0.16	26.2	0.16	0.0	0.0	-0.79915
14:08.3	7.31E+00	0:00:27	0.16	27.2	0.16	0.0	0.0	-0.809108
14:09.3	7.30E+00	0:00:28	0.15	28.2	0.15	0.0	0.0	-0.819301
14:10.3	7.30E+00	0:00:29	0.15	29.2	0.15	0.0	0.0	-0.819301
14:11.3	7.30E+00	0:00:30	0.15	30.2	0.15	0.0	0.0	-0.829738
14:12.3	7.29E+00	0:00:31	0.14	31.2	0.14	0.0	0.0	-0.862963
14:13.3	7.29E+00	0:00:32	0.14	32.2	0.14	0.0	0.0	-0.862963
14:14.3	7.28E+00	0:00:33	0.13	33.2	0.13	0.0	0.0	-0.874519
14:15.3	7.28E+00	0:00:34	0.13	34.2	0.13	0.0	0.0	-0.886391
14:16.6	7.28E+00	0:00:35	0.13	35.5	0.13	0.0	0.0	-0.886391
14:17.3	7.28E+00	0:00:36	0.13	36.2	0.13	0.0	0.0	-0.898597
14:18.3	7.27E+00	0:00:37	0.12	37.2	0.12	0.0	0.0	-0.911155
14:19.3	7.27E+00	0:00:38	0.12	38.2	0.12	0.0	0.0	-0.911155
14:20.3	7.27E+00	0:00:39	0.12	39.2	0.12	0.0	0.0	-0.924088
14:21.3	7.27E+00	0:00:40	0.12	40.2	0.12	0.0	0.0	-0.924088
14:22.3	7.26E+00	0:00:41	0.11	41.2	0.11	0.0	0.0	-0.95117
14:23.3	7.27E+00	0:00:42	0.12	42.2	0.12	0.0	0.0	-0.937418
14:24.3	7.26E+00	0:00:43	0.11	43.2	0.11	0.0	0.0	-0.95117
14:25.3	7.26E+00	0:00:44	0.11	44.2	0.11	0.0	0.0	-0.95117
14:26.3	7.25E+00	0:00:45	0.10	45.2	0.10	0.0	0.0	-0.980468
14:27.3	7.25E+00	0:00:46	0.10	46.2	0.10	0.0	0.0	-0.980468
14:28.3	7.25E+00	0:00:47	0.10	47.2	0.10	0.0	0.0	-0.980468
14:29.3	7.25E+00	0:00:48	0.10	48.2	0.10	0.0	0.0	-0.980468
14:30.3	7.25E+00	0:00:49	0.10	49.2	0.10	0.0	0.0	-0.980468
14:31.3	7.25E+00	0:00:50	0.10	50.2	0.10	0.0	0.0	-0.980468
14:32.3	7.25E+00	0:00:51	0.10	51.2	0.10	0.0	0.0	-0.995679
14:33.3	7.25E+00	0:00:52	0.10	52.2	0.10	0.0	0.0	-1.011441
14:34.3	7.25E+00	0:00:53	0.10	53.2	0.10	0.0	0.0	-1.011441
14:35.3	7.24E+00	0:00:54	0.09	54.2	0.09	0.0	0.0	-1.027797

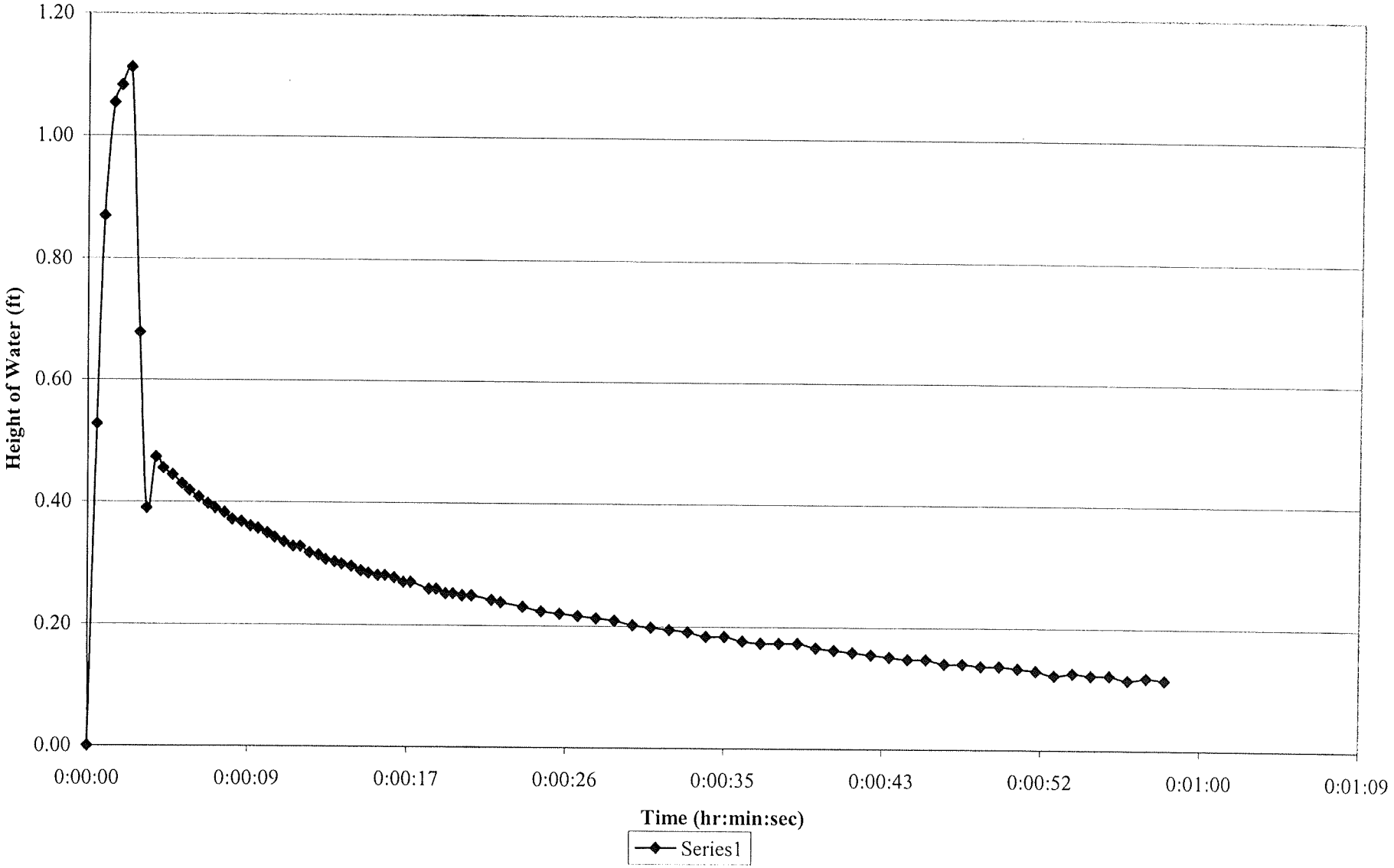
Vernon Co. MW-8R Slug Out



Time	MW-8R Slug Out Analog#01 MW-8R..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
21:34.1	7.16E+00	0:00:00	0.00	0.0	0.00	0.0	0.0	#NUM!
21:34.6	6.59E+00	0:00:00	-0.57	0.5	0.57	0.0	0.0	-0.243897
21:35.0	6.98E+00	0:00:01	-0.17	0.9	0.17	0.0	0.0	-0.761201
21:35.5	6.97E+00	0:00:01	-0.19	1.4	0.19	0.0	0.0	-0.726536
21:35.9	6.72E+00	0:00:02	-0.44	1.8	0.44	0.0	0.0	-0.356153
21:36.4	6.99E+00	0:00:02	-0.17	2.3	0.17	0.0	0.0	-0.770574
21:36.9	6.52E+00	0:00:03	-0.64	2.8	0.64	0.0	0.0	-0.194567
21:37.3	6.14E+00	0:00:03	-1.01	3.2	1.01	0.0	0.0	0.0061236
21:37.8	6.06E+00	0:00:04	-1.10	3.7	1.10	0.0	0.0	0.0417479
21:38.2	6.20E+00	0:00:04	-0.96	4.1	0.96	0.0	0.0	-0.017684
21:38.7	6.31E+00	0:00:05	-0.85	4.6	0.85	0.0	0.0	-0.069662
21:39.2	6.39E+00	0:00:05	-0.77	5.1	0.77	0.0	0.0	-0.112158
21:39.6	6.45E+00	0:00:06	-0.71	5.5	0.71	0.0	0.0	-0.150335
21:40.1	6.51E+00	0:00:06	-0.65	6.0	0.65	0.0	0.0	-0.187287
21:40.5	6.56E+00	0:00:06	-0.60	6.4	0.60	0.0	0.0	-0.222428
21:41.0	6.60E+00	0:00:07	-0.56	6.9	0.56	0.0	0.0	-0.2522
21:42.1	6.67E+00	0:00:08	-0.49	8.0	0.49	0.0	0.0	-0.312204
21:42.6	6.69E+00	0:00:08	-0.47	8.5	0.47	0.0	0.0	-0.331987
21:43.0	6.71E+00	0:00:09	-0.44	8.9	0.44	0.0	0.0	-0.352617
21:43.5	6.73E+00	0:00:09	-0.43	9.4	0.43	0.0	0.0	-0.367037
21:43.9	6.75E+00	0:00:10	-0.41	9.8	0.41	0.0	0.0	-0.389446
21:44.4	6.76E+00	0:00:10	-0.40	10.3	0.40	0.0	0.0	-0.401209
21:44.9	6.77E+00	0:00:11	-0.38	10.8	0.38	0.0	0.0	-0.417255
21:45.3	6.79E+00	0:00:11	-0.37	11.2	0.37	0.0	0.0	-0.433916
21:45.8	6.80E+00	0:00:12	-0.36	11.7	0.36	0.0	0.0	-0.442613
21:46.2	6.81E+00	0:00:12	-0.35	12.1	0.35	0.0	0.0	-0.460297
21:46.7	6.84E+00	0:00:13	-0.31	12.6	0.31	0.0	0.0	-0.50307
21:47.2	6.86E+00	0:00:13	-0.30	13.1	0.30	0.0	0.0	-0.523458
21:47.6	6.83E+00	0:00:13	-0.33	13.5	0.33	0.0	0.0	-0.478731
21:48.1	6.83E+00	0:00:14	-0.33	14.0	0.33	0.0	0.0	-0.483465
21:48.6	6.84E+00	0:00:14	-0.32	14.5	0.32	0.0	0.0	-0.49812
21:49.0	6.84E+00	0:00:15	-0.31	14.9	0.31	0.0	0.0	-0.50307
21:49.5	6.85E+00	0:00:15	-0.30	15.4	0.30	0.0	0.0	-0.518271
21:49.9	6.85E+00	0:00:16	-0.31	15.8	0.31	0.0	0.0	-0.513145
21:50.4	6.87E+00	0:00:16	-0.29	16.3	0.29	0.0	0.0	-0.534023
21:50.9	6.87E+00	0:00:17	-0.29	16.8	0.29	0.0	0.0	-0.534023
21:51.3	6.87E+00	0:00:17	-0.29	17.2	0.29	0.0	0.0	-0.539403
21:51.8	6.87E+00	0:00:18	-0.29	17.7	0.29	0.0	0.0	-0.539403
21:52.2	6.87E+00	0:00:18	-0.29	18.1	0.29	0.0	0.0	-0.545003
21:52.7	6.88E+00	0:00:19	-0.28	18.6	0.28	0.0	0.0	-0.556111
21:53.2	6.88E+00	0:00:19	-0.27	19.1	0.27	0.0	0.0	-0.561774
21:53.6	6.89E+00	0:00:19	-0.27	19.5	0.27	0.0	0.0	-0.567512
21:54.1	6.93E+00	0:00:20	-0.23	20.0	0.23	0.0	0.0	-0.636388
21:54.5	6.92E+00	0:00:20	-0.23	20.4	0.23	0.0	0.0	-0.629672
21:55.0	6.88E+00	0:00:21	-0.27	20.9	0.27	0.0	0.0	-0.561774
21:55.5	6.89E+00	0:00:21	-0.26	21.4	0.26	0.0	0.0	-0.579219
21:55.9	6.89E+00	0:00:22	-0.27	21.8	0.27	0.0	0.0	-0.573326
21:56.8	6.90E+00	0:00:23	-0.26	22.7	0.26	0.0	0.0	-0.591251
21:57.3	6.90E+00	0:00:23	-0.26	23.2	0.26	0.0	0.0	-0.591251
21:57.8	6.91E+00	0:00:24	-0.25	23.7	0.25	0.0	0.0	-0.610125
21:58.2	6.91E+00	0:00:24	-0.25	24.1	0.25	0.0	0.0	-0.610125
21:58.7	6.92E+00	0:00:25	-0.23	24.6	0.23	0.0	0.0	-0.629672

Time	MW-8R Slug Out Analog#01 MW-8R..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
21:59.1	6.92E+00	0:00:25	-0.24	25.0	0.24	0.0	0.0	-0.623058
21:59.6	6.94E+00	0:00:25	-0.21	25.5	0.21	0.0	0.0	-0.67162
22:00.1	6.93E+00	0:00:26	-0.23	26.0	0.23	0.0	0.0	-0.636388
22:01.3	6.93E+00	0:00:27	-0.22	27.2	0.22	0.0	0.0	-0.65014
22:02.3	6.93E+00	0:00:28	-0.22	28.2	0.22	0.0	0.0	-0.65014
22:03.3	6.93E+00	0:00:29	-0.22	29.2	0.22	0.0	0.0	-0.65014
22:04.3	6.95E+00	0:00:30	-0.21	30.2	0.21	0.0	0.0	-0.679023
22:05.3	6.95E+00	0:00:31	-0.21	31.2	0.21	0.0	0.0	-0.686766
22:06.3	6.91E+00	0:00:32	-0.25	32.2	0.25	0.0	0.0	-0.610125
22:07.3	6.95E+00	0:00:33	-0.21	33.2	0.21	0.0	0.0	-0.686766
22:08.3	6.96E+00	0:00:34	-0.20	34.2	0.20	0.0	0.0	-0.702239
22:09.3	6.96E+00	0:00:35	-0.20	35.2	0.20	0.0	0.0	-0.702239
22:10.3	6.96E+00	0:00:36	-0.19	36.2	0.19	0.0	0.0	-0.710188
22:11.3	6.97E+00	0:00:37	-0.19	37.2	0.19	0.0	0.0	-0.718285
22:12.3	6.97E+00	0:00:38	-0.19	38.2	0.19	0.0	0.0	-0.726536
22:13.3	6.97E+00	0:00:39	-0.19	39.2	0.19	0.0	0.0	-0.726536
22:14.3	6.98E+00	0:00:40	-0.18	40.2	0.18	0.0	0.0	-0.752272
22:15.3	6.99E+00	0:00:41	-0.17	41.2	0.17	0.0	0.0	-0.779892
22:16.3	7.00E+00	0:00:42	-0.16	42.2	0.16	0.0	0.0	-0.789414
22:17.3	6.99E+00	0:00:43	-0.17	43.2	0.17	0.0	0.0	-0.779892
22:18.3	6.99E+00	0:00:44	-0.17	44.2	0.17	0.0	0.0	-0.779892
22:19.3	7.00E+00	0:00:45	-0.16	45.2	0.16	0.0	0.0	-0.789414
22:20.3	7.00E+00	0:00:46	-0.16	46.2	0.16	0.0	0.0	-0.79915
22:21.3	7.01E+00	0:00:47	-0.15	47.2	0.15	0.0	0.0	-0.819301
22:22.3	7.01E+00	0:00:48	-0.15	48.2	0.15	0.0	0.0	-0.829738
22:23.3	7.01E+00	0:00:49	-0.15	49.2	0.15	0.0	0.0	-0.819301
22:24.3	7.01E+00	0:00:50	-0.15	50.2	0.15	0.0	0.0	-0.819301
22:25.6	7.01E+00	0:00:51	-0.15	51.5	0.15	0.0	0.0	-0.829738
22:26.3	7.02E+00	0:00:52	-0.14	52.2	0.14	0.0	0.0	-0.851397
22:27.3	7.01E+00	0:00:53	-0.14	53.2	0.14	0.0	0.0	-0.840433
22:28.3	7.03E+00	0:00:54	-0.13	54.2	0.13	0.0	0.0	-0.886391
22:29.3	7.02E+00	0:00:55	-0.14	55.2	0.14	0.0	0.0	-0.851397
22:30.3	7.02E+00	0:00:56	-0.13	56.2	0.13	0.0	0.0	-0.874194
22:31.3	7.03E+00	0:00:57	-0.13	57.2	0.13	0.0	0.0	-0.886391
22:32.3	7.03E+00	0:00:58	-0.13	58.2	0.13	0.0	0.0	-0.886391
22:33.3	7.03E+00	0:00:59	-0.13	59.2	0.13	0.0	0.0	-0.898597
22:34.3	7.02E+00	0:01:00	-0.13	60.2	0.13	0.0	0.0	-0.874194
22:35.3	7.03E+00	0:01:01	-0.13	61.2	0.13	0.0	0.0	-0.886391
22:36.3	7.04E+00	0:01:02	-0.12	62.2	0.12	0.0	0.0	-0.924088
22:37.3	7.05E+00	0:01:03	-0.11	63.2	0.11	0.0	0.0	-0.95117
22:38.3	7.03E+00	0:01:04	-0.13	64.2	0.13	0.0	0.0	-0.886391
22:39.3	7.03E+00	0:01:05	-0.13	65.2	0.13	0.0	0.0	-0.898597
22:40.3	7.04E+00	0:01:06	-0.12	66.2	0.12	0.0	0.0	-0.924088
22:41.3	7.04E+00	0:01:07	-0.12	67.2	0.12	0.0	0.0	-0.924088
22:42.3	7.04E+00	0:01:08	-0.12	68.2	0.12	0.0	0.0	-0.937418
22:43.3	7.04E+00	0:01:09	-0.12	69.2	0.12	0.0	0.0	-0.924088
22:44.3	7.03E+00	0:01:10	-0.12	70.2	0.12	0.0	0.0	-0.911155
22:45.3	7.05E+00	0:01:11	-0.11	71.2	0.11	0.0	0.0	-0.95117
22:47.3	7.03E+00	0:01:13	-0.12	73.2	0.12	0.0	0.0	-0.911155
22:48.3	7.05E+00	0:01:14	-0.11	74.2	0.11	0.0	0.0	-0.95117
22:49.3	7.05E+00	0:01:15	-0.11	75.2	0.11	0.0	0.0	-0.965372

Vernon Co. MW-9 Slug In



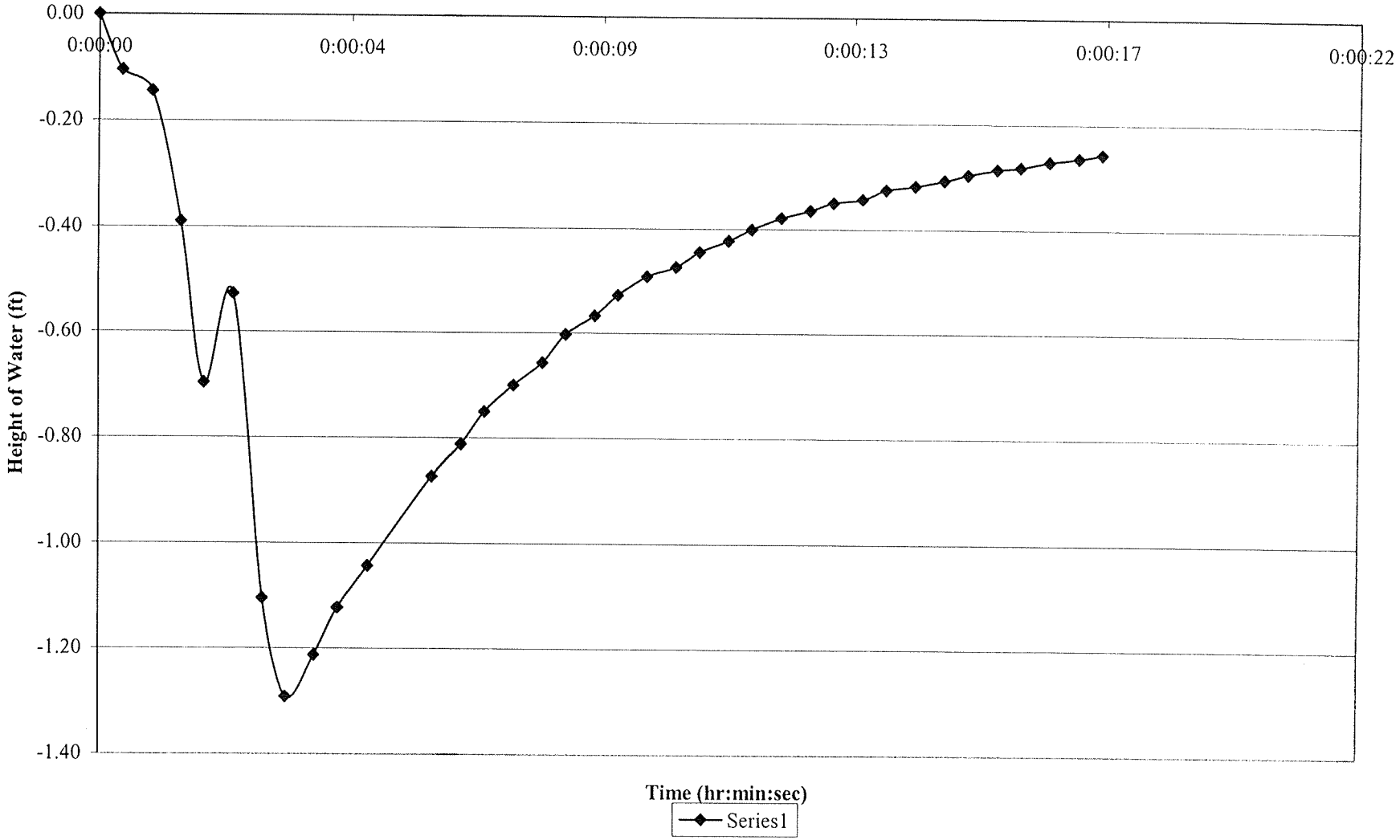
06/13/2003

0946W9A.xls MW9a graph

Time	MW-9 Slug In Analog#01 mw-9..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
11:48.7	6.06E+00	0:00:00	0.00	0.0	0.00	0.0	0.0	#NUM!
11:49.2	6.59E+00	0:00:00	0.53	0.5	0.53	0.0	0.0	-0.278271801
11:49.6	6.93E+00	0:00:01	0.87	0.9	0.87	0.0	0.0	-0.060580597
11:50.1	7.12E+00	0:00:01	1.05	1.4	1.05	0.0	0.0	0.022799405
11:50.5	7.15E+00	0:00:02	1.08	1.8	1.08	0.0	0.0	0.034548247
11:51.0	7.18E+00	0:00:02	1.11	2.3	1.11	0.0	0.0	0.045948538
11:51.5	6.74E+00	0:00:03	0.68	2.8	0.68	0.0	0.0	-0.168450148
11:51.9	6.45E+00	0:00:03	0.39	3.2	0.39	0.0	0.0	-0.409158165
11:52.4	6.54E+00	0:00:04	0.47	3.7	0.47	0.0	0.0	-0.325322532
11:52.8	6.52E+00	0:00:04	0.45	4.1	0.45	0.0	0.0	-0.342275046
11:53.3	6.51E+00	0:00:05	0.44	4.6	0.44	0.0	0.0	-0.352714855
11:53.8	6.49E+00	0:00:05	0.43	5.1	0.43	0.0	0.0	-0.367036832
11:54.2	6.48E+00	0:00:06	0.42	5.5	0.42	0.0	0.0	-0.378200776
11:54.7	6.47E+00	0:00:06	0.41	6.0	0.41	0.0	0.0	-0.389552779
11:55.2	6.46E+00	0:00:06	0.40	6.5	0.40	0.0	0.0	-0.401209493
11:55.6	6.45E+00	0:00:07	0.39	6.9	0.39	0.0	0.0	-0.409158165
11:56.1	6.45E+00	0:00:07	0.38	7.4	0.38	0.0	0.0	-0.417368561
11:56.5	6.44E+00	0:00:08	0.37	7.8	0.37	0.0	0.0	-0.429807439
11:57.0	6.43E+00	0:00:08	0.37	8.3	0.37	0.0	0.0	-0.434034183
11:57.5	6.42E+00	0:00:09	0.36	8.8	0.36	0.0	0.0	-0.442613118
11:57.9	6.42E+00	0:00:09	0.36	9.2	0.36	0.0	0.0	-0.446966984
11:58.4	6.41E+00	0:00:10	0.35	9.7	0.35	0.0	0.0	-0.455807889
11:58.8	6.41E+00	0:00:10	0.34	10.1	0.34	0.0	0.0	-0.464959187
11:59.3	6.40E+00	0:00:11	0.34	10.6	0.34	0.0	0.0	-0.474178048
11:59.8	6.39E+00	0:00:11	0.33	11.1	0.33	0.0	0.0	-0.483596852
12:00.2	6.39E+00	0:00:11	0.33	11.5	0.33	0.0	0.0	-0.483596852
12:00.7	6.38E+00	0:00:12	0.32	12.0	0.32	0.0	0.0	-0.498119506
12:01.2	6.38E+00	0:00:13	0.31	12.5	0.31	0.0	0.0	-0.503070352
12:01.6	6.37E+00	0:00:13	0.31	12.9	0.31	0.0	0.0	-0.513286224
12:02.1	6.37E+00	0:00:13	0.30	13.4	0.30	0.0	0.0	-0.518414064
12:02.5	6.36E+00	0:00:14	0.30	13.8	0.30	0.0	0.0	-0.523603173
12:03.0	6.36E+00	0:00:14	0.30	14.3	0.30	0.0	0.0	-0.528855035
12:03.5	6.35E+00	0:00:15	0.29	14.8	0.29	0.0	0.0	-0.539553216
12:03.9	6.35E+00	0:00:15	0.29	15.2	0.29	0.0	0.0	-0.545002783
12:04.4	6.35E+00	0:00:16	0.28	15.7	0.28	0.0	0.0	-0.550521601
12:04.8	6.35E+00	0:00:16	0.28	16.1	0.28	0.0	0.0	-0.550521601
12:05.3	6.34E+00	0:00:17	0.28	16.6	0.28	0.0	0.0	-0.556111453
12:05.8	6.33E+00	0:00:17	0.27	17.1	0.27	0.0	0.0	-0.567511744
12:06.2	6.33E+00	0:00:18	0.27	17.5	0.27	0.0	0.0	-0.567511744
12:07.2	6.32E+00	0:00:19	0.26	18.5	0.26	0.0	0.0	-0.585360853
12:07.6	6.32E+00	0:00:19	0.26	18.9	0.26	0.0	0.0	-0.585360853
12:08.1	6.32E+00	0:00:19	0.25	19.4	0.25	0.0	0.0	-0.597566654
12:08.5	6.32E+00	0:00:20	0.25	19.8	0.25	0.0	0.0	-0.597566654
12:09.0	6.31E+00	0:00:20	0.25	20.3	0.25	0.0	0.0	-0.603800653
12:09.5	6.31E+00	0:00:21	0.25	20.8	0.25	0.0	0.0	-0.603800653
12:10.6	6.31E+00	0:00:22	0.24	21.9	0.24	0.0	0.0	-0.616543703
12:11.1	6.30E+00	0:00:22	0.24	22.4	0.24	0.0	0.0	-0.623058243
12:12.3	6.29E+00	0:00:24	0.23	23.6	0.23	0.0	0.0	-0.63638802
12:13.3	6.29E+00	0:00:25	0.22	24.6	0.22	0.0	0.0	-0.650334016
12:14.3	6.28E+00	0:00:26	0.22	25.6	0.22	0.0	0.0	-0.657379957
12:15.3	6.28E+00	0:00:27	0.22	26.6	0.22	0.0	0.0	-0.664542099
12:16.3	6.28E+00	0:00:28	0.21	27.6	0.21	0.0	0.0	-0.671824339
12:17.3	6.27E+00	0:00:29	0.21	28.6	0.21	0.0	0.0	-0.679230772
12:18.3	6.27E+00	0:00:30	0.20	29.6	0.20	0.0	0.0	-0.694433686
12:19.3	6.26E+00	0:00:31	0.20	30.6	0.20	0.0	0.0	-0.702239489

Time	MW-9 Slug In Analog#01 mw-9..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
12:20.3	6.26E+00	0:00:32	0.19	31.6	0.19	0.0	0.0	-0.710188161
12:21.3	6.26E+00	0:00:33	0.19	32.6	0.19	0.0	0.0	-0.718512112
12:22.3	6.25E+00	0:00:34	0.18	33.6	0.18	0.0	0.0	-0.735182177
12:23.3	6.25E+00	0:00:35	0.18	34.6	0.18	0.0	0.0	-0.735182177
12:24.3	6.24E+00	0:00:36	0.18	35.6	0.18	0.0	0.0	-0.752517739
12:25.3	6.24E+00	0:00:37	0.17	36.6	0.17	0.0	0.0	-0.761452112
12:26.3	6.24E+00	0:00:38	0.17	37.6	0.17	0.0	0.0	-0.761452112
12:27.3	6.24E+00	0:00:39	0.17	38.6	0.17	0.0	0.0	-0.761452112
12:28.3	6.23E+00	0:00:40	0.17	39.6	0.17	0.0	0.0	-0.779891912
12:29.3	6.23E+00	0:00:41	0.16	40.6	0.16	0.0	0.0	-0.789413975
12:30.3	6.22E+00	0:00:42	0.16	41.6	0.16	0.0	0.0	-0.799149502
12:31.3	6.22E+00	0:00:43	0.16	42.6	0.16	0.0	0.0	-0.809108283
12:32.3	6.22E+00	0:00:44	0.15	43.6	0.15	0.0	0.0	-0.819587367
12:33.3	6.21E+00	0:00:45	0.15	44.6	0.15	0.0	0.0	-0.830031826
12:34.3	6.21E+00	0:00:46	0.15	45.6	0.15	0.0	0.0	-0.830031826
12:35.3	6.20E+00	0:00:47	0.14	46.6	0.14	0.0	0.0	-0.851705903
12:36.3	6.20E+00	0:00:48	0.14	47.6	0.14	0.0	0.0	-0.851705903
12:37.3	6.20E+00	0:00:49	0.14	48.6	0.14	0.0	0.0	-0.862962545
12:38.3	6.20E+00	0:00:50	0.14	49.6	0.14	0.0	0.0	-0.862962545
12:39.3	6.20E+00	0:00:51	0.13	50.6	0.13	0.0	0.0	-0.874518734
12:40.3	6.19E+00	0:00:52	0.13	51.6	0.13	0.0	0.0	-0.886390849
12:41.3	6.19E+00	0:00:53	0.12	52.6	0.12	0.0	0.0	-0.911155437
12:42.3	6.19E+00	0:00:54	0.13	53.6	0.13	0.0	0.0	-0.898596649
12:43.3	6.19E+00	0:00:55	0.12	54.6	0.12	0.0	0.0	-0.911155437
12:44.3	6.19E+00	0:00:56	0.12	55.6	0.12	0.0	0.0	-0.911155437
12:45.3	6.18E+00	0:00:57	0.12	56.6	0.12	0.0	0.0	-0.937418016
12:46.3	6.18E+00	0:00:58	0.12	57.6	0.12	0.0	0.0	-0.924088239
12:47.3	6.18E+00	0:00:59	0.12	58.6	0.12	0.0	0.0	-0.937418016
12:48.3	6.18E+00	0:01:00	0.11	59.6	0.11	0.0	0.0	-0.951558196
12:49.3	6.17E+00	0:01:01	0.11	60.6	0.11	0.0	0.0	-0.965772739
12:50.3	6.17E+00	0:01:02	0.11	61.6	0.11	0.0	0.0	-0.965772739
12:51.3	6.17E+00	0:01:03	0.11	62.6	0.11	0.0	0.0	-0.965772739
12:52.3	6.17E+00	0:01:04	0.11	63.6	0.11	0.0	0.0	-0.965772739
12:53.3	6.17E+00	0:01:05	0.11	64.6	0.11	0.0	0.0	-0.965772739
12:54.3	6.16E+00	0:01:06	0.10	65.6	0.10	0.0	0.0	-0.995678626
12:55.6	6.16E+00	0:01:07	0.10	66.9	0.10	0.0	0.0	-0.995678626
12:56.3	6.16E+00	0:01:08	0.10	67.6	0.10	0.0	0.0	-1.011441043
12:58.3	6.16E+00	0:01:10	0.10	69.6	0.10	0.0	0.0	-1.011441043
12:59.3	6.16E+00	0:01:11	0.09	70.6	0.09	0.0	0.0	-1.027797162
13:00.3	6.16E+00	0:01:12	0.09	71.6	0.09	0.0	0.0	-1.027797162
13:01.3	6.16E+00	0:01:13	0.09	72.6	0.09	0.0	0.0	-1.027797162
13:02.3	6.15E+00	0:01:14	0.09	73.6	0.09	0.0	0.0	-1.044793462
13:03.3	6.15E+00	0:01:15	0.09	74.6	0.09	0.0	0.0	-1.062482108
13:04.3	6.15E+00	0:01:16	0.09	75.6	0.09	0.0	0.0	-1.062482108
13:05.3	6.15E+00	0:01:17	0.09	76.6	0.09	0.0	0.0	-1.062482108
13:06.3	6.15E+00	0:01:18	0.09	77.6	0.09	0.0	0.0	-1.062482108
13:07.3	6.15E+00	0:01:19	0.09	78.6	0.09	0.0	0.0	-1.062482108
13:08.3	6.15E+00	0:01:20	0.08	79.6	0.08	0.0	0.0	-1.080921908
13:09.3	6.15E+00	0:01:21	0.08	80.6	0.08	0.0	0.0	-1.080921908
13:10.3	6.15E+00	0:01:22	0.09	81.6	0.09	0.0	0.0	-1.062482108
13:11.4	6.14E+00	0:01:23	0.08	82.7	0.08	0.0	0.0	-1.100179498
13:21.3	6.14E+00	0:01:33	0.08	92.6	0.08	0.0	0.0	-1.12090412
13:31.3	6.13E+00	0:01:43	0.06	102.6	0.06	0.0	0.0	-1.212539525
13:41.3	6.12E+00	0:01:53	0.06	112.6	0.06	0.0	0.0	-1.238824187
13:51.3	6.12E+00	0:02:03	0.05	122.6	0.05	0.0	0.0	-1.266802735

Vernon Co. MW-9 Slug Out



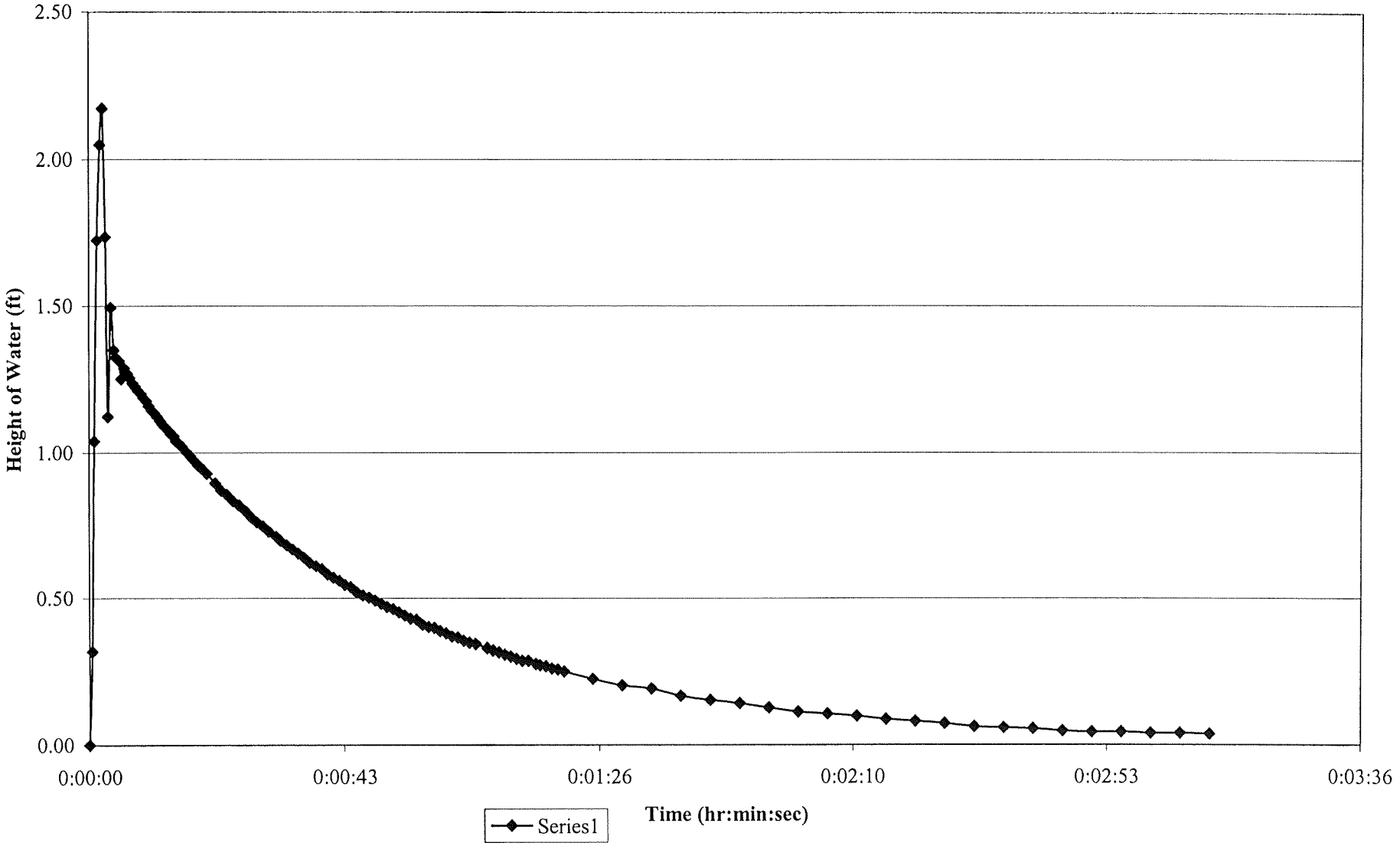
06/13/2003

0946W9B.xls MW9b graph

Time	MW-9 Slug Out Analog#01 mw-9..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
19:07.9	6.09E+00	0:00:00	0.00	0.0	0.00	0.0	0.0	#NUM!
19:08.3	5.98E+00	0:00:00	-0.10	0.4	0.10	0.0	0.0	-0.980053
19:08.8	5.94E+00	0:00:01	-0.14	0.9	0.14	0.0	0.0	-0.840433
19:09.3	5.70E+00	0:00:01	-0.39	1.4	0.39	0.0	0.0	-0.409158
19:09.7	5.39E+00	0:00:02	-0.70	1.8	0.70	0.0	0.0	-0.157017
19:10.2	5.56E+00	0:00:02	-0.53	2.3	0.53	0.0	0.0	-0.278189
19:10.7	4.98E+00	0:00:03	-1.10	2.8	1.10	0.0	0.0	0.0431657
19:11.1	4.79E+00	0:00:03	-1.29	3.2	1.29	0.0	0.0	0.1112961
19:11.6	4.87E+00	0:00:04	-1.21	3.7	1.21	0.0	0.0	0.0837534
19:12.0	4.96E+00	0:00:04	-1.12	4.1	1.12	0.0	0.0	0.0501863
19:12.5	5.04E+00	0:00:05	-1.04	4.6	1.04	0.0	0.0	0.0183259
19:13.6	5.21E+00	0:00:06	-0.87	5.7	0.87	0.0	0.0	-0.058737
19:14.1	5.27E+00	0:00:06	-0.81	6.2	0.81	0.0	0.0	-0.09039
19:14.5	5.33E+00	0:00:07	-0.75	6.6	0.75	0.0	0.0	-0.124534
19:15.0	5.39E+00	0:00:07	-0.70	7.1	0.70	0.0	0.0	-0.154778
19:15.5	5.43E+00	0:00:08	-0.66	7.6	0.66	0.0	0.0	-0.182501
19:15.9	5.48E+00	0:00:08	-0.60	8.0	0.60	0.0	0.0	-0.219827
19:16.4	5.52E+00	0:00:08	-0.57	8.5	0.57	0.0	0.0	-0.246647
19:16.8	5.56E+00	0:00:09	-0.53	8.9	0.53	0.0	0.0	-0.278189
19:17.3	5.59E+00	0:00:09	-0.49	9.4	0.49	0.0	0.0	-0.309007
19:17.8	5.61E+00	0:00:10	-0.47	9.9	0.47	0.0	0.0	-0.325323
19:18.2	5.64E+00	0:00:10	-0.44	10.3	0.44	0.0	0.0	-0.352715
19:18.7	5.66E+00	0:00:11	-0.42	10.8	0.42	0.0	0.0	-0.374379
19:19.1	5.68E+00	0:00:11	-0.40	11.2	0.40	0.0	0.0	-0.397289
19:19.6	5.71E+00	0:00:12	-0.38	11.7	0.38	0.0	0.0	-0.421361
19:20.1	5.72E+00	0:00:12	-0.36	12.2	0.36	0.0	0.0	-0.438302
19:20.5	5.74E+00	0:00:13	-0.35	12.6	0.35	0.0	0.0	-0.455808
19:21.0	5.74E+00	0:00:13	-0.34	13.1	0.34	0.0	0.0	-0.464833
19:21.4	5.76E+00	0:00:13	-0.32	13.5	0.32	0.0	0.0	-0.488384
19:21.9	5.77E+00	0:00:14	-0.32	14.0	0.32	0.0	0.0	-0.49812
19:22.4	5.78E+00	0:00:15	-0.31	14.5	0.31	0.0	0.0	-0.513145
19:22.8	5.79E+00	0:00:15	-0.30	14.9	0.30	0.0	0.0	-0.528708
19:23.3	5.80E+00	0:00:15	-0.29	15.4	0.29	0.0	0.0	-0.545003
19:23.7	5.80E+00	0:00:16	-0.28	15.8	0.28	0.0	0.0	-0.550522
19:24.2	5.81E+00	0:00:16	-0.27	16.3	0.27	0.0	0.0	-0.567512
19:24.7	5.82E+00	0:00:17	-0.26	16.8	0.26	0.0	0.0	-0.579219
19:25.1	5.83E+00	0:00:17	-0.26	17.2	0.26	0.0	0.0	-0.591251
19:25.6	5.83E+00	0:00:18	-0.25	17.7	0.25	0.0	0.0	-0.597567
19:26.0	5.84E+00	0:00:18	-0.25	18.1	0.25	0.0	0.0	-0.610125
19:26.5	5.85E+00	0:00:19	-0.24	18.6	0.24	0.0	0.0	-0.623058
19:27.0	5.85E+00	0:00:19	-0.23	19.1	0.23	0.0	0.0	-0.629672
19:27.4	5.85E+00	0:00:19	-0.23	19.5	0.23	0.0	0.0	-0.636388
19:27.9	5.86E+00	0:00:20	-0.23	20.0	0.23	0.0	0.0	-0.64321
19:28.4	5.86E+00	0:00:20	-0.23	20.5	0.23	0.0	0.0	-0.64321
19:28.8	5.87E+00	0:00:21	-0.22	20.9	0.22	0.0	0.0	-0.657183
19:29.3	5.87E+00	0:00:21	-0.22	21.4	0.22	0.0	0.0	-0.664342
19:29.7	5.87E+00	0:00:22	-0.21	21.8	0.21	0.0	0.0	-0.671824
19:30.2	5.88E+00	0:00:22	-0.21	22.3	0.21	0.0	0.0	-0.679231
19:31.1	5.88E+00	0:00:23	-0.20	23.2	0.20	0.0	0.0	-0.694434
19:31.6	5.89E+00	0:00:24	-0.20	23.7	0.20	0.0	0.0	-0.702239
19:32.0	5.89E+00	0:00:24	-0.19	24.1	0.19	0.0	0.0	-0.710188
19:32.5	5.89E+00	0:00:25	-0.19	24.6	0.19	0.0	0.0	-0.710188
19:33.0	5.89E+00	0:00:25	-0.19	25.1	0.19	0.0	0.0	-0.710188
19:33.4	5.90E+00	0:00:25	-0.18	25.5	0.18	0.0	0.0	-0.734946
19:33.9	5.90E+00	0:00:26	-0.18	26.0	0.18	0.0	0.0	-0.734946

Time	MW-9 Slug Out Analog#01 mw-9..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
19:34.4	5.90E+00	0:00:26	-0.18	26.5	0.18	0.0	0.0	-0.743523
19:35.3	5.91E+00	0:00:27	-0.17	27.4	0.17	0.0	0.0	-0.761452
19:36.3	5.92E+00	0:00:28	-0.17	28.4	0.17	0.0	0.0	-0.770574
19:37.3	5.92E+00	0:00:29	-0.16	29.4	0.16	0.0	0.0	-0.789414
19:38.3	5.93E+00	0:00:30	-0.16	30.4	0.16	0.0	0.0	-0.79915
19:39.3	5.93E+00	0:00:31	-0.16	31.4	0.16	0.0	0.0	-0.809108
19:40.3	5.94E+00	0:00:32	-0.15	32.4	0.15	0.0	0.0	-0.829738
19:41.3	5.94E+00	0:00:33	-0.15	33.4	0.15	0.0	0.0	-0.829738
19:42.3	5.94E+00	0:00:34	-0.14	34.4	0.14	0.0	0.0	-0.851397
19:43.3	5.95E+00	0:00:35	-0.14	35.4	0.14	0.0	0.0	-0.862963
19:44.3	5.94E+00	0:00:36	-0.14	36.4	0.14	0.0	0.0	-0.851397
19:45.3	5.95E+00	0:00:37	-0.13	37.4	0.13	0.0	0.0	-0.874519
19:46.3	5.96E+00	0:00:38	-0.12	38.4	0.12	0.0	0.0	-0.911155
19:47.3	5.96E+00	0:00:39	-0.13	39.4	0.13	0.0	0.0	-0.886391
19:48.3	5.97E+00	0:00:40	-0.12	40.4	0.12	0.0	0.0	-0.937418
19:49.3	5.97E+00	0:00:41	-0.11	41.4	0.11	0.0	0.0	-0.95117
19:50.3	5.97E+00	0:00:42	-0.11	42.4	0.11	0.0	0.0	-0.95117
19:51.3	5.97E+00	0:00:43	-0.11	43.4	0.11	0.0	0.0	-0.95117
19:52.3	5.98E+00	0:00:44	-0.10	44.4	0.10	0.0	0.0	-0.980053
19:53.3	5.98E+00	0:00:45	-0.10	45.4	0.10	0.0	0.0	-0.980053
19:54.3	5.98E+00	0:00:46	-0.10	46.4	0.10	0.0	0.0	-0.995249
19:55.3	5.99E+00	0:00:47	-0.10	47.4	0.10	0.0	0.0	-1.011441
19:56.6	6.00E+00	0:00:49	-0.09	48.7	0.09	0.0	0.0	-1.044793
19:57.3	6.00E+00	0:00:49	-0.09	49.4	0.09	0.0	0.0	-1.062482
19:58.3	5.99E+00	0:00:50	-0.09	50.4	0.09	0.0	0.0	-1.027797
19:59.3	6.00E+00	0:00:51	-0.09	51.4	0.09	0.0	0.0	-1.062482
20:00.3	6.00E+00	0:00:52	-0.08	52.4	0.08	0.0	0.0	-1.080922
20:01.3	6.00E+00	0:00:53	-0.08	53.4	0.08	0.0	0.0	-1.080922
20:02.3	6.01E+00	0:00:54	-0.08	54.4	0.08	0.0	0.0	-1.120331
20:03.3	6.01E+00	0:00:55	-0.08	55.4	0.08	0.0	0.0	-1.100179
20:04.3	6.00E+00	0:00:56	-0.09	56.4	0.09	0.0	0.0	-1.062482
20:05.3	6.01E+00	0:00:57	-0.08	57.4	0.08	0.0	0.0	-1.120331
20:06.3	6.01E+00	0:00:58	-0.07	58.4	0.07	0.0	0.0	-1.141463
20:07.3	6.01E+00	0:00:59	-0.08	59.4	0.08	0.0	0.0	-1.100179
20:08.3	6.02E+00	0:01:00	-0.07	60.4	0.07	0.0	0.0	-1.163676
20:09.3	6.02E+00	0:01:01	-0.07	61.4	0.07	0.0	0.0	-1.163676
20:10.3	6.02E+00	0:01:02	-0.07	62.4	0.07	0.0	0.0	-1.163676
20:11.3	6.01E+00	0:01:03	-0.07	63.4	0.07	0.0	0.0	-1.141463
20:12.3	6.03E+00	0:01:04	-0.06	64.4	0.06	0.0	0.0	-1.238824
20:13.3	6.02E+00	0:01:05	-0.07	65.4	0.07	0.0	0.0	-1.163676
20:14.3	6.02E+00	0:01:06	-0.07	66.4	0.07	0.0	0.0	-1.163676
20:15.3	6.02E+00	0:01:07	-0.06	67.4	0.06	0.0	0.0	-1.211832
20:16.3	6.02E+00	0:01:08	-0.06	68.4	0.06	0.0	0.0	-1.187087
20:17.3	6.02E+00	0:01:09	-0.06	69.4	0.06	0.0	0.0	-1.211832
20:18.3	6.03E+00	0:01:10	-0.05	70.4	0.05	0.0	0.0	-1.296709
20:19.3	6.03E+00	0:01:11	-0.05	71.4	0.05	0.0	0.0	-1.266803
20:21.3	6.03E+00	0:01:13	-0.06	73.4	0.06	0.0	0.0	-1.238824
20:22.3	6.02E+00	0:01:14	-0.06	74.4	0.06	0.0	0.0	-1.211832
20:23.3	6.03E+00	0:01:15	-0.05	75.4	0.05	0.0	0.0	-1.296709
20:24.3	6.03E+00	0:01:16	-0.05	76.4	0.05	0.0	0.0	-1.266803
20:25.3	6.03E+00	0:01:17	-0.05	77.4	0.05	0.0	0.0	-1.266803
20:26.3	6.03E+00	0:01:18	-0.05	78.4	0.05	0.0	0.0	-1.296709
20:27.3	6.03E+00	0:01:19	-0.05	79.4	0.05	0.0	0.0	-1.296709
20:28.3	6.03E+00	0:01:20	-0.05	80.4	0.05	0.0	0.0	-1.296709
20:29.3	6.03E+00	0:01:21	-0.05	81.4	0.05	0.0	0.0	-1.296709

Vernon Co. MW-10 Slug In



08/26/2003

946W10A.xls MW10a graph

Date	Time	MW10 Slug In Analog#01 mw-10..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	13:36:51	7.74E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
07/15/98	13:36:51	8.06E+00	0:00:00	0.32	0.5	0.32	0.0	0.00	-0.4981195
07/15/98	13:36:52	8.78E+00	0:00:01	1.04	0.9	1.04	0.0	0.00	0.01682449
07/15/98	13:36:52	9.47E+00	0:00:01	1.73	1.4	1.73	0.0	0.00	0.23686462
07/15/98	13:36:53	9.79E+00	0:00:02	2.05	1.9	2.05	0.0	0.00	0.31177505
07/15/98	13:36:53	9.92E+00	0:00:02	2.17	2.3	2.17	0.0	0.00	0.33703974
07/15/98	13:36:54	9.48E+00	0:00:03	1.74	2.8	1.74	0.0	0.00	0.23957474
07/15/98	13:36:54	8.86E+00	0:00:03	1.12	3.2	1.12	0.0	0.00	0.05018635
07/15/98	13:36:55	9.24E+00	0:00:04	1.49	3.7	1.49	0.0	0.00	0.1744378
07/15/98	13:36:55	9.09E+00	0:00:04	1.35	4.2	1.35	0.0	0.00	0.1303016
07/15/98	13:36:56	9.07E+00	0:00:05	1.32	4.6	1.32	0.0	0.00	0.12211754
07/15/98	13:36:56	9.06E+00	0:00:05	1.31	5.1	1.31	0.0	0.00	0.11852926
07/15/98	13:36:56	8.99E+00	0:00:06	1.25	5.5	1.25	0.0	0.00	0.09777773
07/15/98	13:36:57	9.03E+00	0:00:06	1.29	6.0	1.29	0.0	0.00	0.11011813
07/15/98	13:36:57	9.01E+00	0:00:06	1.27	6.5	1.27	0.0	0.00	0.10397467
07/15/98	13:36:58	9.00E+00	0:00:07	1.26	6.9	1.26	0.0	0.00	0.09902422
07/15/98	13:36:58	8.98E+00	0:00:07	1.24	7.4	1.24	0.0	0.00	0.09272064
07/15/98	13:36:59	8.97E+00	0:00:08	1.23	7.8	1.23	0.0	0.00	0.08891535
07/15/98	13:36:59	8.95E+00	0:00:08	1.21	8.3	1.21	0.0	0.00	0.08378919
07/15/98	13:37:00	8.94E+00	0:00:09	1.20	8.8	1.20	0.0	0.00	0.07986834
07/15/98	13:37:00	8.93E+00	0:00:09	1.19	9.2	1.19	0.0	0.00	0.07463362
07/15/98	13:37:01	8.92E+00	0:00:10	1.18	9.7	1.18	0.0	0.00	0.07066575
07/15/98	13:37:01	8.90E+00	0:00:10	1.16	10.1	1.16	0.0	0.00	0.06393352
07/15/98	13:37:02	8.89E+00	0:00:11	1.14	10.6	1.14	0.0	0.00	0.05850194
07/15/98	13:37:02	8.88E+00	0:00:11	1.13	11.1	1.13	0.0	0.00	0.05438321
07/15/98	13:37:02	8.86E+00	0:00:12	1.12	11.5	1.12	0.0	0.00	0.05018635
07/15/98	13:37:03	8.85E+00	0:00:12	1.11	12.0	1.11	0.0	0.00	0.04457895
07/15/98	13:37:03	8.84E+00	0:00:12	1.10	12.4	1.10	0.0	0.00	0.04032538
07/15/98	13:37:04	8.83E+00	0:00:13	1.09	12.9	1.09	0.0	0.00	0.03598976
07/15/98	13:37:04	8.82E+00	0:00:13	1.08	13.4	1.08	0.0	0.00	0.03165079
07/15/98	13:37:05	8.81E+00	0:00:14	1.06	13.8	1.06	0.0	0.00	0.02726804
07/15/98	13:37:05	8.80E+00	0:00:14	1.06	14.3	1.06	0.0	0.00	0.02432144
07/15/98	13:37:06	8.78E+00	0:00:15	1.04	14.7	1.04	0.0	0.00	0.01682449
07/15/98	13:37:06	8.77E+00	0:00:15	1.03	15.2	1.03	0.0	0.00	0.01380593
07/15/98	13:37:07	8.76E+00	0:00:16	1.02	15.7	1.02	0.0	0.00	0.00923837
07/15/98	13:37:08	8.74E+00	0:00:17	1.00	16.6	1.00	0.0	0.00	-8.687E-05
07/15/98	13:37:08	8.73E+00	0:00:17	0.99	17.1	0.99	0.0	0.00	-0.0048037
07/15/98	13:37:08	8.72E+00	0:00:18	0.98	17.5	0.98	0.0	0.00	-0.0095723
07/15/98	13:37:09	8.71E+00	0:00:18	0.97	18.0	0.97	0.0	0.00	-0.0144388
07/15/98	13:37:09	8.70E+00	0:00:18	0.96	18.4	0.96	0.0	0.00	-0.019315
07/15/98	13:37:10	8.69E+00	0:00:19	0.95	18.9	0.95	0.0	0.00	-0.0225965
07/15/98	13:37:10	8.68E+00	0:00:19	0.94	19.4	0.94	0.0	0.00	-0.027612
07/15/98	13:37:11	8.67E+00	0:00:20	0.93	19.9	0.93	0.0	0.00	-0.0326393
07/15/98	13:37:12	8.64E+00	0:00:21	0.90	21.3	0.90	0.0	0.00	-0.0481284
07/15/98	13:37:13	8.61E+00	0:00:22	0.87	22.3	0.87	0.0	0.00	-0.0605307
07/15/98	13:37:14	8.60E+00	0:00:23	0.86	23.3	0.86	0.0	0.00	-0.0678308
07/15/98	13:37:15	8.58E+00	0:00:24	0.83	24.3	0.83	0.0	0.00	-0.0789381
07/15/98	13:37:16	8.56E+00	0:00:25	0.82	25.3	0.82	0.0	0.00	-0.086557
07/15/98	13:37:17	8.54E+00	0:00:26	0.80	26.3	0.80	0.0	0.00	-0.0962049

Date	Time	MW10 Slug In Analog#01 mw-10..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	13:37:18	8.52E+00	0:00:27	0.78	27.3	0.78	0.0	0.00	-0.1081282
07/15/98	13:37:19	8.50E+00	0:00:28	0.76	28.3	0.76	0.0	0.00	-0.1182731
07/15/98	13:37:20	8.49E+00	0:00:29	0.75	29.3	0.75	0.0	0.00	-0.1265631
07/15/98	13:37:21	8.47E+00	0:00:30	0.73	30.3	0.73	0.0	0.00	-0.1372129
07/15/98	13:37:23	8.45E+00	0:00:32	0.71	31.6	0.71	0.0	0.00	-0.1480693
07/15/98	13:37:23	8.44E+00	0:00:32	0.70	32.3	0.70	0.0	0.00	-0.1570165
07/15/98	13:37:24	8.42E+00	0:00:33	0.68	33.3	0.68	0.0	0.00	-0.1660883
07/15/98	13:37:25	8.41E+00	0:00:34	0.67	34.3	0.67	0.0	0.00	-0.1754186
07/15/98	13:37:26	8.40E+00	0:00:35	0.65	35.3	0.65	0.0	0.00	-0.1848873
07/15/98	13:37:27	8.38E+00	0:00:36	0.64	36.3	0.64	0.0	0.00	-0.1945671
07/15/98	13:37:28	8.36E+00	0:00:37	0.62	37.3	0.62	0.0	0.00	-0.2070483
07/15/98	13:37:29	8.35E+00	0:00:38	0.61	38.3	0.61	0.0	0.00	-0.2146702
07/15/98	13:37:30	8.34E+00	0:00:39	0.60	39.3	0.60	0.0	0.00	-0.2224282
07/15/98	13:37:31	8.32E+00	0:00:40	0.58	40.3	0.58	0.0	0.00	-0.2357491
07/15/98	13:37:32	8.31E+00	0:00:41	0.57	41.3	0.57	0.0	0.00	-0.2438966
07/15/98	13:37:33	8.30E+00	0:00:42	0.56	42.3	0.56	0.0	0.00	-0.2521999
07/15/98	13:37:34	8.29E+00	0:00:43	0.55	43.3	0.55	0.0	0.00	-0.2636035
07/15/98	13:37:35	8.28E+00	0:00:44	0.54	44.3	0.54	0.0	0.00	-0.2693792
07/15/98	13:37:36	8.26E+00	0:00:45	0.52	45.3	0.52	0.0	0.00	-0.2841637
07/15/98	13:37:37	8.25E+00	0:00:46	0.51	46.3	0.51	0.0	0.00	-0.2933675
07/15/98	13:37:38	8.24E+00	0:00:47	0.50	47.3	0.50	0.0	0.00	-0.2995559
07/15/98	13:37:39	8.23E+00	0:00:48	0.49	48.3	0.49	0.0	0.00	-0.309007
07/15/98	13:37:40	8.22E+00	0:00:49	0.48	49.3	0.48	0.0	0.00	-0.3186683
07/15/98	13:37:41	8.21E+00	0:00:50	0.47	50.3	0.47	0.0	0.00	-0.328642
07/15/98	13:37:42	8.20E+00	0:00:51	0.46	51.3	0.46	0.0	0.00	-0.335358
07/15/98	13:37:43	8.19E+00	0:00:52	0.45	52.3	0.45	0.0	0.00	-0.3456309
07/15/98	13:37:44	8.18E+00	0:00:53	0.44	53.3	0.44	0.0	0.00	-0.3561527
07/15/98	13:37:45	8.17E+00	0:00:54	0.43	54.3	0.43	0.0	0.00	-0.3670368
07/15/98	13:37:46	8.17E+00	0:00:55	0.43	55.3	0.43	0.0	0.00	-0.3706924
07/15/98	13:37:47	8.15E+00	0:00:56	0.41	56.3	0.41	0.0	0.00	-0.3894463
07/15/98	13:37:48	8.14E+00	0:00:57	0.40	57.3	0.40	0.0	0.00	-0.3971807
07/15/98	13:37:49	8.14E+00	0:00:58	0.40	58.3	0.40	0.0	0.00	-0.4012095
07/15/98	13:37:50	8.13E+00	0:00:59	0.39	59.3	0.39	0.0	0.00	-0.4131877
07/15/98	13:37:51	8.12E+00	0:01:00	0.38	60.3	0.38	0.0	0.00	-0.4213608
07/15/98	13:37:52	8.11E+00	0:01:01	0.37	61.3	0.37	0.0	0.00	-0.4339162
07/15/98	13:37:53	8.11E+00	0:01:02	0.36	62.3	0.36	0.0	0.00	-0.4381833
07/15/98	13:37:54	8.10E+00	0:01:03	0.35	63.3	0.35	0.0	0.00	-0.4513649
07/15/98	13:37:55	8.09E+00	0:01:04	0.35	64.3	0.35	0.0	0.00	-0.4602968
07/15/98	13:37:56	8.09E+00	0:01:05	0.34	65.3	0.34	0.0	0.00	-0.4648325
07/15/98	13:37:58	8.07E+00	0:01:07	0.33	67.3	0.33	0.0	0.00	-0.4834646
07/15/98	13:37:59	8.06E+00	0:01:08	0.32	68.3	0.32	0.0	0.00	-0.4932245
07/15/98	13:38:00	8.06E+00	0:01:09	0.31	69.3	0.31	0.0	0.00	-0.5030704
07/15/98	13:38:01	8.05E+00	0:01:10	0.31	70.3	0.31	0.0	0.00	-0.5131446
07/15/98	13:38:02	8.04E+00	0:01:11	0.30	71.3	0.30	0.0	0.00	-0.5234582
07/15/98	13:38:03	8.03E+00	0:01:12	0.29	72.3	0.29	0.0	0.00	-0.5340226
07/15/98	13:38:04	8.03E+00	0:01:13	0.29	73.3	0.29	0.0	0.00	-0.5448505
07/15/98	13:38:05	8.03E+00	0:01:14	0.29	74.3	0.29	0.0	0.00	-0.5448505
07/15/98	13:38:07	8.02E+00	0:01:16	0.27	75.6	0.27	0.0	0.00	-0.5617742
07/15/98	13:38:07	8.01E+00	0:01:16	0.27	76.3	0.27	0.0	0.00	-0.5675117

Date	Time	MW10 Slug In Analog#01 mw-10..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	13:38:08	8.01E+00	0:01:17	0.27	77.3	0.27	0.0	0.00	-0.5733261
07/15/98	13:38:09	8.00E+00	0:01:18	0.26	78.3	0.26	0.0	0.00	-0.5851937
07/15/98	13:38:10	8.00E+00	0:01:19	0.26	79.3	0.26	0.0	0.00	-0.5912514
07/15/98	13:38:11	7.99E+00	0:01:20	0.25	80.4	0.25	0.0	0.00	-0.6036263
07/15/98	13:38:16	7.97E+00	0:01:25	0.22	85.3	0.22	0.0	0.00	-0.6501399
07/15/98	13:38:21	7.94E+00	0:01:30	0.20	90.3	0.20	0.0	0.00	-0.6944337
07/15/98	13:38:26	7.93E+00	0:01:35	0.19	95.3	0.19	0.0	0.00	-0.718285
07/15/98	13:38:31	7.91E+00	0:01:40	0.17	100.3	0.17	0.0	0.00	-0.7798919
07/15/98	13:38:36	7.89E+00	0:01:45	0.15	105.3	0.15	0.0	0.00	-0.8193008
07/15/98	13:38:41	7.88E+00	0:01:50	0.14	110.3	0.14	0.0	0.00	-0.8513973
07/15/98	13:38:46	7.87E+00	0:01:55	0.13	115.3	0.13	0.0	0.00	-0.8985966
07/15/98	13:38:51	7.85E+00	0:02:00	0.11	120.3	0.11	0.0	0.00	-0.9511699
07/15/98	13:38:56	7.85E+00	0:02:05	0.10	125.3	0.10	0.0	0.00	-0.9800533
07/15/98	13:39:01	7.84E+00	0:02:10	0.10	130.3	0.10	0.0	0.00	-1.0109954
07/15/98	13:39:06	7.83E+00	0:02:15	0.09	135.3	0.09	0.0	0.00	-1.0624821
07/15/98	13:39:11	7.82E+00	0:02:20	0.08	140.3	0.08	0.0	0.00	-1.1001795
07/15/98	13:39:16	7.81E+00	0:02:25	0.07	145.3	0.07	0.0	0.00	-1.1414628
07/15/98	13:39:21	7.80E+00	0:02:30	0.06	150.3	0.06	0.0	0.00	-1.2118316
07/15/98	13:39:26	7.80E+00	0:02:35	0.06	155.3	0.06	0.0	0.00	-1.2380722
07/15/98	13:39:31	7.80E+00	0:02:40	0.05	160.3	0.05	0.0	0.00	-1.2660007
07/15/98	13:39:36	7.79E+00	0:02:45	0.05	165.3	0.05	0.0	0.00	-1.3288272
07/15/98	13:39:41	7.79E+00	0:02:50	0.04	170.3	0.04	0.0	0.00	-1.3635121
07/15/98	13:39:46	7.79E+00	0:02:55	0.04	175.3	0.04	0.0	0.00	-1.3635121
07/15/98	13:39:51	7.78E+00	0:03:00	0.04	180.3	0.04	0.0	0.00	-1.4012095
07/15/98	13:39:56	7.78E+00	0:03:05	0.04	185.3	0.04	0.0	0.00	-1.4012095
07/15/98	13:40:01	7.78E+00	0:03:10	0.04	190.3	0.04	0.0	0.00	-1.4424928
07/15/98	13:40:35	7.76E+00	0:03:44	0.02	224.2	0.02	0.0	0.00	-1.6635403
07/15/98	13:40:36	7.7638	0:03:45	0.02	224.6	0.02	0.0	0.00	-1.6635403
07/15/98	13:40:36	7.7602	0:03:45	0.02	225.1	0.02	0.0	0.00	-1.7423214
07/15/98	13:40:37	7.7638	0:03:46	0.02	225.5	0.02	0.0	0.00	-1.6635403
07/15/98	13:40:37	7.7674	0:03:46	0.03	226.0	0.03	0.0	0.00	-1.5968795
07/15/98	13:40:37	7.7638	0:03:47	0.02	226.5	0.02	0.0	0.00	-1.6635403
07/15/98	13:40:38	7.7674	0:03:47	0.03	226.9	0.03	0.0	0.00	-1.5968795
07/15/98	13:40:38	7.7638	0:03:47	0.02	227.4	0.02	0.0	0.00	-1.6635403
07/15/98	13:40:39	7.7638	0:03:48	0.02	227.8	0.02	0.0	0.00	-1.6635403
07/15/98	13:40:39	7.7638	0:03:48	0.02	228.3	0.02	0.0	0.00	-1.6635403
07/15/98	13:40:40	7.7602	0:03:49	0.02	228.8	0.02	0.0	0.00	-1.7423214
07/15/98	13:40:40	7.7602	0:03:49	0.02	229.2	0.02	0.0	0.00	-1.7423214
07/15/98	13:40:41	7.7638	0:03:50	0.02	229.7	0.02	0.0	0.00	-1.6635403
07/15/98	13:40:41	7.0744	0:03:50	-0.67	230.1	0.67	0.0	0.00	-0.1754186
07/15/98	13:40:42	6.9625	0:03:51	-0.78	230.6	0.78	0.0	0.00	-0.1081282
07/15/98	13:40:42	7.6663	0:03:51	-0.08	231.1	0.08	0.0	0.00	-1.1203308
07/15/98	13:40:43	7.2224	0:03:52	-0.52	231.5	0.52	0.0	0.00	-0.2842473
07/15/98	13:40:43	7.12E+00	0:03:52	-0.62	232.0	0.62	0.0	0.00	-0.2070483
07/15/98	13:40:43	6.4211	0:03:52	-1.32	232.4	1.32	0.0	0.00	0.12090282
07/15/98	13:40:44	6.2803	0:03:53	-1.46	232.9	1.46	0.0	0.00	0.16488796
07/15/98	13:40:44	6.302	0:03:53	-1.44	233.4	1.44	0.0	0.00	0.15839265
07/15/98	13:40:45	6.3236	0:03:54	-1.42	233.8	1.42	0.0	0.00	0.15182934
07/15/98	13:40:45	6.3453	0:03:54	-1.40	234.3	1.40	0.0	0.00	0.14513423

 Terra8 Data File --> C:\TMP\946W10X

Date	Time	MW10 Slug In Analog#01 mw-10..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	13:40:46	6.3561	0:03:55	-1.39	234.7	1.39	0.0	0.00	0.14176323
07/15/98	13:40:46	6.3742	0:03:55	-1.37	235.2	1.37	0.0	0.00	0.13605435
07/15/98	13:40:47	6.3958	0:03:56	-1.35	235.7	1.35	0.0	0.00	0.12914185
07/15/98	13:40:47	6.4103	0:03:56	-1.33	236.1	1.33	0.0	0.00	0.12443901
07/15/98	13:40:48	6.4211	0:03:57	-1.32	236.6	1.32	0.0	0.00	0.12090282
07/15/98	13:40:48	6.4391	0:03:57	-1.30	237.0	1.30	0.0	0.00	0.11494442
07/15/98	13:40:49	6.4572	0:03:58	-1.28	237.5	1.28	0.0	0.00	0.10886933
07/15/98	13:40:49	6.468	0:03:58	-1.27	238.0	1.27	0.0	0.00	0.10520352
07/15/98	13:40:49	6.486	0:03:58	-1.26	238.4	1.26	0.0	0.00	0.09902422
07/15/98	13:40:50	6.4969	0:03:59	-1.25	238.9	1.25	0.0	0.00	0.09523911
07/15/98	13:40:50	6.5185	0:03:59	-1.22	239.3	1.22	0.0	0.00	0.08763947
07/15/98	13:40:51	6.5366	0:04:00	-1.21	239.8	1.21	0.0	0.00	0.08116721
07/15/98	13:40:51	6.5474	0:04:00	-1.19	240.3	1.19	0.0	0.00	0.07725886
07/15/98	13:40:52	6.5546	0:04:01	-1.19	240.7	1.19	0.0	0.00	0.07463362
07/15/98	13:40:52	6.5763	0:04:01	-1.17	241.2	1.17	0.0	0.00	0.06662405
07/15/98	13:40:53	6.5871	0:04:02	-1.16	241.6	1.16	0.0	0.00	0.06258198
07/15/98	13:40:53	6.6015	0:04:02	-1.14	242.1	1.14	0.0	0.00	0.05713337
07/15/98	13:40:54	6.6124	0:04:03	-1.13	242.6	1.13	0.0	0.00	0.05296313
07/15/98	13:40:54	6.6268	0:04:03	-1.12	243.0	1.12	0.0	0.00	0.0473917
07/15/98	13:40:55	6.6376	0:04:04	-1.10	243.5	1.10	0.0	0.00	0.04316572
07/15/98	13:40:55	6.6485	0:04:04	-1.09	243.9	1.09	0.0	0.00	0.0388585
07/15/98	13:40:55	6.6629	0:04:04	-1.08	244.4	1.08	0.0	0.00	0.03310194
07/15/98	13:40:56	6.6701	0:04:05	-1.07	244.9	1.07	0.0	0.00	0.03019479
07/15/98	13:40:56	6.6846	0:04:05	-1.06	245.3	1.06	0.0	0.00	0.02428038
07/15/98	13:40:57	6.6954	0:04:06	-1.05	245.8	1.05	0.0	0.00	0.01982222
07/15/98	13:40:57	6.7062	0:04:06	-1.04	246.2	1.04	0.0	0.00	0.01531783
07/15/98	13:40:58	6.7207	0:04:07	-1.02	246.7	1.02	0.0	0.00	0.00919585
07/15/98	13:40:58	6.7315	0:04:07	-1.01	247.2	1.01	0.0	0.00	0.00457929
07/15/98	13:40:59	6.7423	0:04:08	-1.00	247.6	1.00	0.0	0.00	-8.687E-05
07/15/98	13:40:59	6.7531	0:04:08	-0.99	248.1	0.99	0.0	0.00	-0.0048037
07/15/98	13:41:00	6.764	0:04:09	-0.98	248.5	0.98	0.0	0.00	-0.0096167
07/15/98	13:41:00	6.7748	0:04:09	-0.97	249.0	0.97	0.0	0.00	-0.0144388
07/15/98	13:41:01	6.782	0:04:10	-0.96	249.5	0.96	0.0	0.00	-0.0176835
07/15/98	13:41:01	6.7928	0:04:10	-0.95	249.9	0.95	0.0	0.00	-0.0225965
07/15/98	13:41:02	6.8181	0:04:11	-0.92	251.0	0.92	0.0	0.00	-0.034328
07/15/98	13:41:02	6.8289	0:04:12	-0.91	251.5	0.91	0.0	0.00	-0.0394341
07/15/98	13:41:03	6.8362	0:04:12	-0.91	252.0	0.91	0.0	0.00	-0.0429197
07/15/98	13:41:03	6.847	0:04:12	-0.90	252.5	0.90	0.0	0.00	-0.0481284
07/15/98	13:41:04	6.865	0:04:13	-0.88	253.3	0.88	0.0	0.00	-0.0569509
07/15/98	13:41:05	6.8867	0:04:14	-0.86	254.3	0.86	0.0	0.00	-0.0678308
07/15/98	13:41:06	6.912	0:04:15	-0.83	255.3	0.83	0.0	0.00	-0.0808696
07/15/98	13:41:07	6.93	0:04:16	-0.81	256.3	0.81	0.0	0.00	-0.0903905
07/15/98	13:41:08	6.9444	0:04:17	-0.80	257.3	0.80	0.0	0.00	-0.0981604
07/15/98	13:41:09	6.9661	0:04:18	-0.78	258.3	0.78	0.0	0.00	-0.1101383
07/15/98	13:41:10	6.9805	0:04:19	-0.76	259.3	0.76	0.0	0.00	-0.1182731
07/15/98	13:41:11	7.0022	0:04:20	-0.74	260.3	0.74	0.0	0.00	-0.130827
07/15/98	13:41:12	7.0166	0:04:21	-0.73	261.3	0.73	0.0	0.00	-0.1393626
07/15/98	13:41:13	7.0311	0:04:22	-0.71	262.3	0.71	0.0	0.00	-0.1481304
07/15/98	13:41:14	7.05E+00	0:04:23	-0.69	263.3	0.69	0.0	0.00	-0.1592668

 Terra8 Data File --> C:\TMP\946W10X

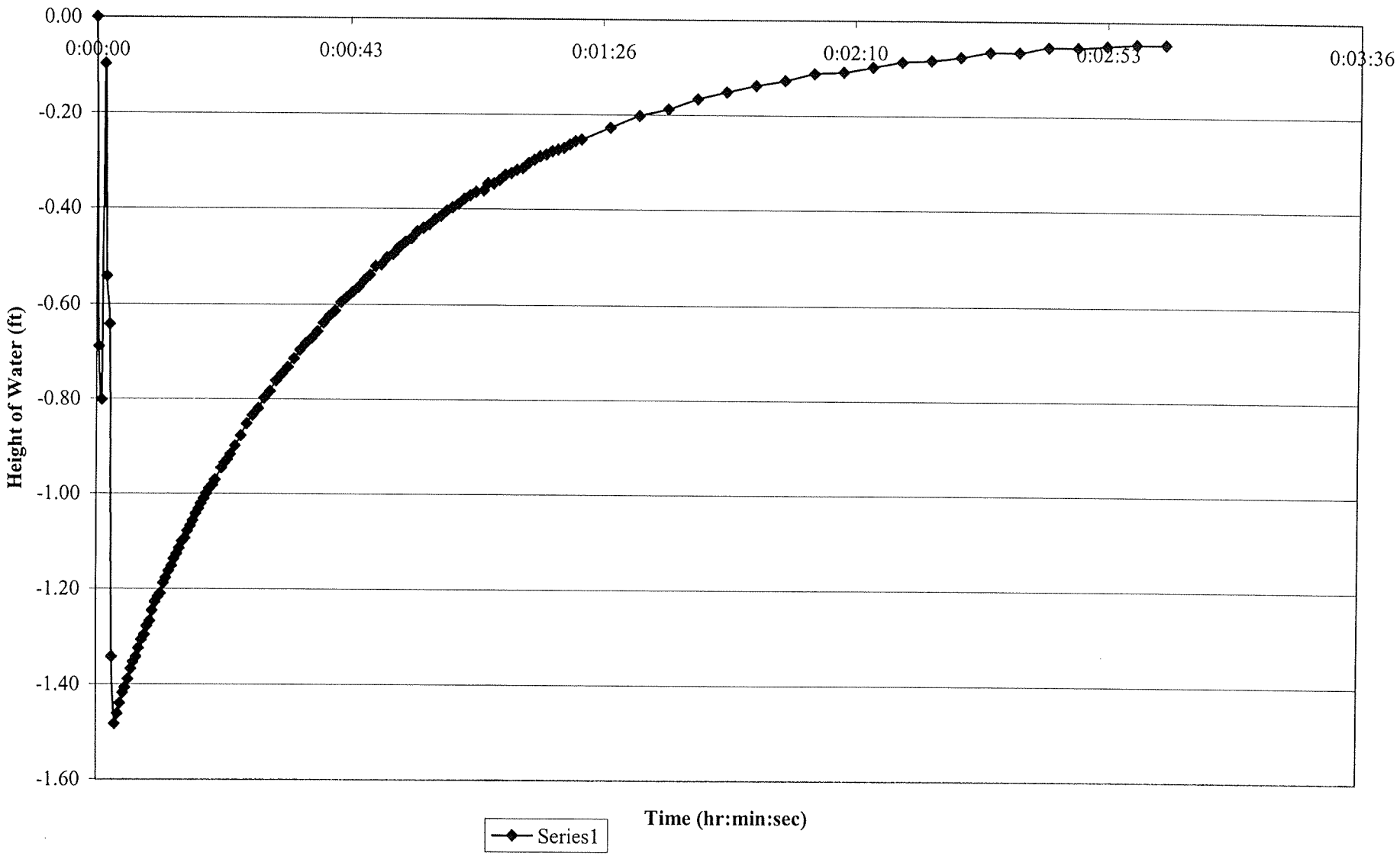
MW10 Slug In

Date	Time	Analog#01 mw-10..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	13:41:15	7.0672	0:04:24	-0.67	264.3	0.67	0.0	0.00	-0.1707606
07/15/98	13:41:16	7.0816	0:04:25	-0.66	265.3	0.66	0.0	0.00	-0.1801272
07/15/98	13:41:17	7.0924	0:04:26	-0.65	266.3	0.65	0.0	0.00	-0.1872871
07/15/98	13:41:18	7.1069	0:04:27	-0.64	267.3	0.64	0.0	0.00	-0.1970895
07/15/98	13:41:19	7.1249	0:04:28	-0.62	268.3	0.62	0.0	0.00	-0.2095741
07/15/98	13:41:20	7.1393	0:04:29	-0.60	269.3	0.60	0.0	0.00	-0.2198268
07/15/98	13:41:21	7.1502	0:04:30	-0.59	270.3	0.59	0.0	0.00	-0.2277517
07/15/98	13:41:22	7.1682	0:04:31	-0.57	271.3	0.57	0.0	0.00	-0.2411638
07/15/98	13:41:23	7.179	0:04:32	-0.56	272.3	0.56	0.0	0.00	-0.2494145
07/15/98	13:41:24	7.1899	0:04:33	-0.55	273.3	0.55	0.0	0.00	-0.2579036
07/15/98	13:41:25	7.2007	0:04:34	-0.54	274.3	0.54	0.0	0.00	-0.2664817
07/15/98	13:41:26	7.2151	0:04:35	-0.53	275.3	0.53	0.0	0.00	-0.2781894
07/15/98	13:41:27	7.226	0:04:36	-0.52	276.3	0.52	0.0	0.00	-0.2872661
07/15/98	13:41:28	7.244	0:04:37	-0.50	277.3	0.50	0.0	0.00	-0.3026835
07/15/98	13:41:29	7.2476	0:04:38	-0.49	278.3	0.49	0.0	0.00	-0.3058337
07/15/98	13:41:30	7.2621	0:04:39	-0.48	279.3	0.48	0.0	0.00	-0.3187588
07/15/98	13:41:31	7.2693	0:04:40	-0.47	280.3	0.47	0.0	0.00	-0.3253225
07/15/98	13:41:32	7.2837	0:04:41	-0.46	281.3	0.46	0.0	0.00	-0.3387554
07/15/98	13:41:33	7.2945	0:04:42	-0.45	282.3	0.45	0.0	0.00	-0.3491099
07/15/98	13:41:34	7.3018	0:04:43	-0.44	283.3	0.44	0.0	0.00	-0.3562513
07/15/98	13:41:35	7.3162	0:04:44	-0.43	284.3	0.43	0.0	0.00	-0.3706924
07/15/98	13:41:36	7.3234	0:04:45	-0.42	285.3	0.42	0.0	0.00	-0.378097
07/15/98	13:41:37	7.3306	0:04:46	-0.41	286.3	0.41	0.0	0.00	-0.3856302
07/15/98	13:41:38	7.3415	0:04:47	-0.40	287.3	0.40	0.0	0.00	-0.3972891
07/15/98	13:41:39	7.3487	0:04:48	-0.39	288.3	0.39	0.0	0.00	-0.4051656
07/15/98	13:41:40	7.3595	0:04:49	-0.38	289.3	0.38	0.0	0.00	-0.417255
07/15/98	13:41:41	7.3667	0:04:50	-0.38	290.3	0.38	0.0	0.00	-0.4255057
07/15/98	13:41:42	7.374	0:04:51	-0.37	291.3	0.37	0.0	0.00	-0.4340342
07/15/98	13:41:43	7.3848	0:04:52	-0.36	292.3	0.36	0.0	0.00	-0.446967
07/15/98	13:41:44	7.392	0:04:53	-0.35	293.3	0.35	0.0	0.00	-0.4558079
07/15/98	13:41:45	7.3992	0:04:54	-0.34	294.3	0.34	0.0	0.00	-0.4648325
07/15/98	13:41:47	7.4028	0:04:56	-0.34	295.6	0.34	0.0	0.00	-0.4694161
07/15/98	13:41:47	7.4173	0:04:56	-0.32	296.3	0.32	0.0	0.00	-0.488384
07/15/98	13:41:48	7.4173	0:04:57	-0.32	297.3	0.32	0.0	0.00	-0.488384
07/15/98	13:41:49	7.4245	0:04:58	-0.32	298.3	0.32	0.0	0.00	-0.4981195
07/15/98	13:41:50	7.4353	0:04:59	-0.31	299.3	0.31	0.0	0.00	-0.5131446
07/15/98	13:41:51	7.4389	0:05:00	-0.30	300.3	0.30	0.0	0.00	-0.5182708
07/15/98	13:41:52	7.4461	0:05:01	-0.30	301.3	0.30	0.0	0.00	-0.5287083
07/15/98	13:41:53	7.4498	0:05:02	-0.29	302.3	0.29	0.0	0.00	-0.5341712
07/15/98	13:41:54	7.4606	0:05:03	-0.28	303.3	0.28	0.0	0.00	-0.5505216
07/15/98	13:41:55	7.4678	0:05:04	-0.27	304.3	0.27	0.0	0.00	-0.5617742
07/15/98	13:41:56	7.475	0:05:05	-0.27	305.3	0.27	0.0	0.00	-0.5733261
07/15/98	13:41:57	7.4786	0:05:06	-0.26	306.3	0.26	0.0	0.00	-0.5792194
07/15/98	13:41:58	7.4858	0:05:07	-0.26	307.3	0.26	0.0	0.00	-0.5912514
07/15/98	13:41:59	7.4895	0:05:08	-0.25	308.3	0.25	0.0	0.00	-0.5975667
07/15/98	13:42:00	7.4931	0:05:09	-0.25	309.3	0.25	0.0	0.00	-0.6038007
07/15/98	13:42:01	7.5003	0:05:10	-0.24	310.3	0.24	0.0	0.00	-0.6165437
07/15/98	13:42:02	7.5075	0:05:11	-0.23	311.3	0.23	0.0	0.00	-0.629672
07/15/98	13:42:03	7.5111	0:05:12	-0.23	312.4	0.23	0.0	0.00	-0.636388

 Terra8 Data File --> C:\TMP\946W10X MW10 Slug In

Date	Time	Analog#01 mw-10..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	13:42:08	7.5364	0:05:17	-0.21	317.3	0.21	0.0	0.00	-0.6867657
07/15/98	13:42:13	7.5616	0:05:22	-0.18	322.3	0.18	0.0	0.00	-0.7435228
07/15/98	13:42:18	7.5761	0:05:27	-0.17	327.3	0.17	0.0	0.00	-0.7798919
07/15/98	13:42:23	7.5977	0:05:32	-0.14	332.3	0.14	0.0	0.00	-0.8404328
07/15/98	13:42:28	7.61E+00	0:05:37	-0.13	337.3	0.13	0.0	0.00	-0.8863908
07/15/98	13:42:33	7.6266	0:05:42	-0.12	342.3	0.12	0.0	0.00	-0.937418
07/15/98	13:42:38	7.6374	0:05:47	-0.10	347.3	0.10	0.0	0.00	-0.9800533
07/15/98	13:42:43	7.6519	0:05:52	-0.09	352.3	0.09	0.0	0.00	-1.0447935
07/15/98	13:42:48	7.6555	0:05:57	-0.09	357.3	0.09	0.0	0.00	-1.0624821
07/15/98	13:42:53	7.6663	0:06:02	-0.08	362.3	0.08	0.0	0.00	-1.1203308
07/15/98	13:42:58	7.6771	0:06:07	-0.06	367.3	0.06	0.0	0.00	-1.1870866
07/15/98	13:43:03	7.6808	0:06:12	-0.06	372.3	0.06	0.0	0.00	-1.2125395
07/15/98	13:43:08	7.688	0:06:17	-0.05	377.3	0.05	0.0	0.00	-1.2668027
07/15/98	13:43:13	7.6988	0:06:22	-0.04	382.3	0.04	0.0	0.00	-1.3635121
07/15/98	13:43:18	7.6988	0:06:27	-0.04	387.3	0.04	0.0	0.00	-1.3635121
07/15/98	13:43:23	7.7096	0:06:32	-0.03	392.3	0.03	0.0	0.00	-1.4881166
07/15/98	13:43:28	7.7096	0:06:37	-0.03	397.3	0.03	0.0	0.00	-1.4881166
07/15/98	13:43:33	7.7132	0:06:42	-0.03	402.3	0.03	0.0	0.00	-1.5391022
07/15/98	13:43:38	7.7168	0:06:47	-0.03	407.3	0.03	0.0	0.00	-1.5968795
07/15/98	13:43:43	7.7168	0:06:52	-0.03	412.3	0.03	0.0	0.00	-1.5968795

Vernon Co. MW-10 Slug Out



08/26/2003

946W10B.xls MW10b graph

 Terra8 Data File --> C:\TMP\946W10X

MW10 Slug In

Date	Time	Analog#01 mw-10..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	13:40:41	7.76E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
07/15/98	13:40:41	7.07E+00	0:00:00	-0.69	0.4	0.69	0.0	0.00	-0.1615287
07/15/98	13:40:42	6.96E+00	0:00:01	-0.80	0.9	0.80	0.0	0.00	-0.0962049
07/15/98	13:40:42	7.67E+00	0:00:01	-0.10	1.4	0.10	0.0	0.00	-1.0109954
07/15/98	13:40:43	7.22E+00	0:00:02	-0.54	1.8	0.54	0.0	0.00	-0.2664817
07/15/98	13:40:43	7.12E+00	0:00:02	-0.64	2.3	0.64	0.0	0.00	-0.1921269
07/15/98	13:40:43	6.42E+00	0:00:03	-1.34	2.7	1.34	0.0	0.00	0.12797899
07/15/98	13:40:44	6.28E+00	0:00:03	-1.48	3.2	1.48	0.0	0.00	0.17128755
07/15/98	13:40:44	6.30E+00	0:00:04	-1.46	3.7	1.46	0.0	0.00	0.16488796
07/15/98	13:40:45	6.32E+00	0:00:04	-1.44	4.1	1.44	0.0	0.00	0.15842281
07/15/98	13:40:45	6.35E+00	0:00:05	-1.42	4.6	1.42	0.0	0.00	0.15182934
07/15/98	13:40:46	6.36E+00	0:00:05	-1.41	5.0	1.41	0.0	0.00	0.14851011
07/15/98	13:40:46	6.37E+00	0:00:06	-1.39	5.5	1.39	0.0	0.00	0.14288981
07/15/98	13:40:47	6.40E+00	0:00:06	-1.37	6.0	1.37	0.0	0.00	0.1360861
07/15/98	13:40:47	6.41E+00	0:00:06	-1.35	6.4	1.35	0.0	0.00	0.13145826
07/15/98	13:40:48	6.42E+00	0:00:07	-1.34	6.9	1.34	0.0	0.00	0.12797899
07/15/98	13:40:48	6.44E+00	0:00:07	-1.32	7.3	1.32	0.0	0.00	0.12211754
07/15/98	13:40:49	6.46E+00	0:00:08	-1.31	7.8	1.31	0.0	0.00	0.11614265
07/15/98	13:40:49	6.47E+00	0:00:08	-1.30	8.3	1.30	0.0	0.00	0.11253798
07/15/98	13:40:49	6.49E+00	0:00:09	-1.28	8.7	1.28	0.0	0.00	0.10646288
07/15/98	13:40:50	6.50E+00	0:00:09	-1.27	9.2	1.27	0.0	0.00	0.10274234
07/15/98	13:40:50	6.52E+00	0:00:10	-1.25	9.6	1.25	0.0	0.00	0.09527399
07/15/98	13:40:51	6.54E+00	0:00:10	-1.23	10.1	1.23	0.0	0.00	0.08891535
07/15/98	13:40:51	6.55E+00	0:00:11	-1.22	10.6	1.22	0.0	0.00	0.08507641
07/15/98	13:40:52	6.55E+00	0:00:11	-1.21	11.0	1.21	0.0	0.00	0.08249814
07/15/98	13:40:52	6.58E+00	0:00:11	-1.19	11.5	1.19	0.0	0.00	0.07463362
07/15/98	13:40:53	6.59E+00	0:00:12	-1.18	11.9	1.18	0.0	0.00	0.07066575
07/15/98	13:40:53	6.60E+00	0:00:12	-1.16	12.4	1.16	0.0	0.00	0.06531824
07/15/98	13:40:54	6.61E+00	0:00:13	-1.15	12.9	1.15	0.0	0.00	0.06122623
07/15/98	13:40:54	6.63E+00	0:00:13	-1.14	13.3	1.14	0.0	0.00	0.05576046
07/15/98	13:40:55	6.64E+00	0:00:14	-1.13	13.8	1.13	0.0	0.00	0.05161552
07/15/98	13:40:55	6.65E+00	0:00:14	-1.12	14.2	1.12	0.0	0.00	0.0473917
07/15/98	13:40:55	6.66E+00	0:00:15	-1.10	14.7	1.10	0.0	0.00	0.04174787
07/15/98	13:40:56	6.67E+00	0:00:15	-1.09	15.2	1.09	0.0	0.00	0.03889821
07/15/98	13:40:56	6.68E+00	0:00:16	-1.08	15.6	1.08	0.0	0.00	0.03310194
07/15/98	13:40:57	6.70E+00	0:00:16	-1.07	16.1	1.07	0.0	0.00	0.02873388
07/15/98	13:40:57	6.71E+00	0:00:16	-1.06	16.5	1.06	0.0	0.00	0.02432144
07/15/98	13:40:58	6.72E+00	0:00:17	-1.04	17.0	1.04	0.0	0.00	0.01832595
07/15/98	13:40:58	6.73E+00	0:00:17	-1.03	17.5	1.03	0.0	0.00	0.01380593
07/15/98	13:40:59	6.74E+00	0:00:18	-1.02	17.9	1.02	0.0	0.00	0.00923837
07/15/98	13:40:59	6.75E+00	0:00:18	-1.01	18.4	1.01	0.0	0.00	0.00462227
07/15/98	13:41:00	6.76E+00	0:00:19	-1.00	18.8	1.00	0.0	0.00	-8.687E-05
07/15/98	13:41:00	6.77E+00	0:00:19	-0.99	19.3	0.99	0.0	0.00	-0.0048037
07/15/98	13:41:01	6.78E+00	0:00:20	-0.98	19.8	0.98	0.0	0.00	-0.007977
07/15/98	13:41:01	6.79E+00	0:00:20	-0.97	20.2	0.97	0.0	0.00	-0.0127808
07/15/98	13:41:02	6.82E+00	0:00:21	-0.95	21.3	0.95	0.0	0.00	-0.0242466
07/15/98	13:41:02	6.83E+00	0:00:22	-0.93	21.8	0.93	0.0	0.00	-0.0292348
07/15/98	13:41:03	6.84E+00	0:00:22	-0.93	22.3	0.93	0.0	0.00	-0.0326393
07/15/98	13:41:03	6.85E+00	0:00:23	-0.92	22.8	0.92	0.0	0.00	-0.0377254

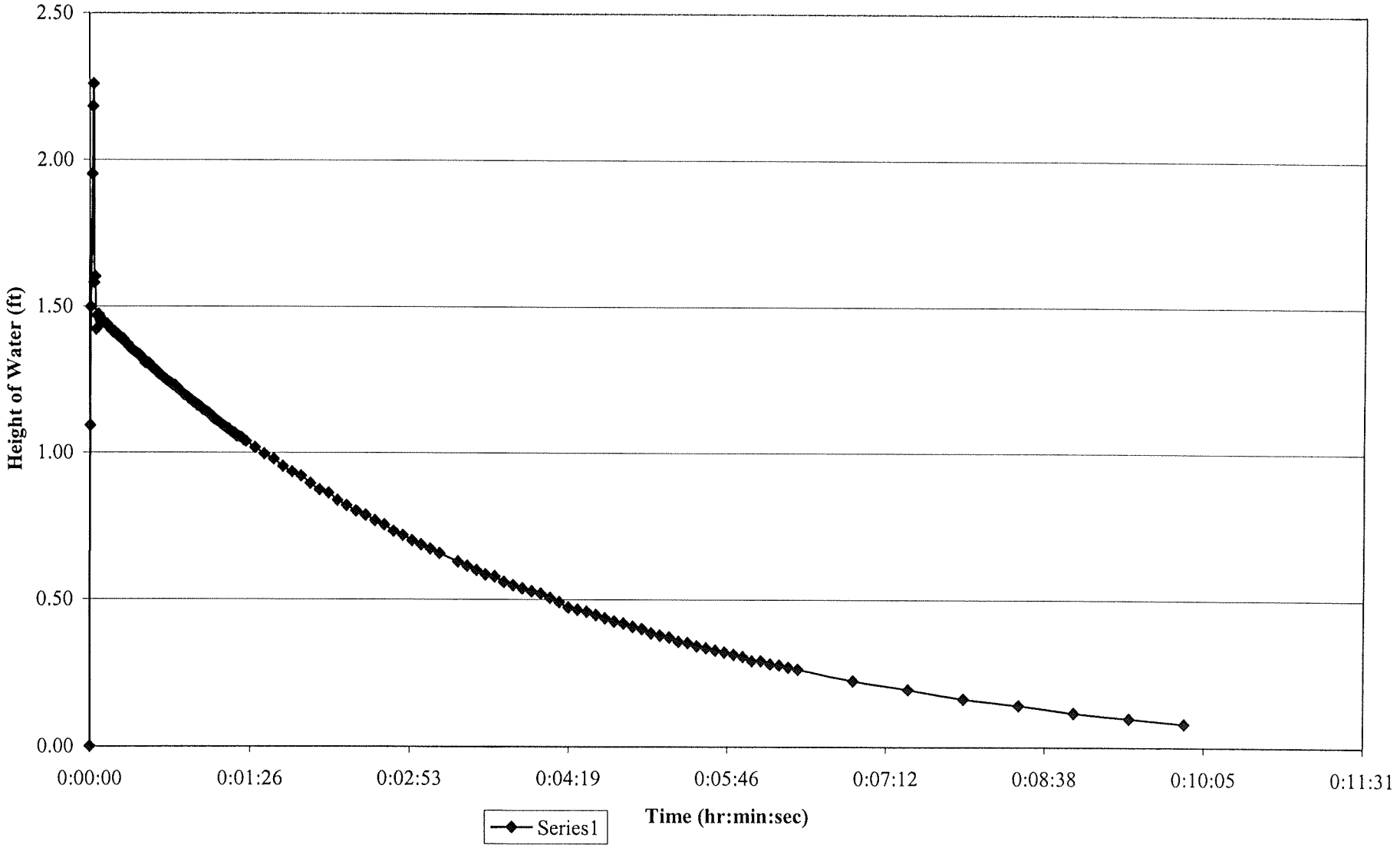
 Terra8 Data File --> C:\TMP\946W10X

Date	Time	MW10 Slug In Analog#01 mw-10..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	13:41:04	6.87E+00	0:00:24	-0.90	23.6	0.90	0.0	0.00	-0.0463369
07/15/98	13:41:05	6.89E+00	0:00:25	-0.88	24.6	0.88	0.0	0.00	-0.0569509
07/15/98	13:41:06	6.91E+00	0:00:26	-0.85	25.6	0.85	0.0	0.00	-0.0696624
07/15/98	13:41:07	6.93E+00	0:00:27	-0.83	26.6	0.83	0.0	0.00	-0.0789381
07/15/98	13:41:08	6.94E+00	0:00:28	-0.82	27.6	0.82	0.0	0.00	-0.086504
07/15/98	13:41:09	6.97E+00	0:00:29	-0.80	28.6	0.80	0.0	0.00	-0.0981604
07/15/98	13:41:10	6.98E+00	0:00:30	-0.78	29.6	0.78	0.0	0.00	-0.1060719
07/15/98	13:41:11	7.00E+00	0:00:31	-0.76	30.6	0.76	0.0	0.00	-0.1182731
07/15/98	13:41:12	7.02E+00	0:00:32	-0.75	31.6	0.75	0.0	0.00	-0.1265631
07/15/98	13:41:13	7.03E+00	0:00:33	-0.73	32.6	0.73	0.0	0.00	-0.1350738
07/15/98	13:41:14	7.05E+00	0:00:34	-0.71	33.6	0.71	0.0	0.00	-0.1458762
07/15/98	13:41:15	7.07E+00	0:00:35	-0.70	34.6	0.70	0.0	0.00	-0.1570165
07/15/98	13:41:16	7.08E+00	0:00:36	-0.68	35.6	0.68	0.0	0.00	-0.1660883
07/15/98	13:41:17	7.09E+00	0:00:37	-0.67	36.6	0.67	0.0	0.00	-0.1730187
07/15/98	13:41:18	7.11E+00	0:00:38	-0.66	37.6	0.66	0.0	0.00	-0.1825007
07/15/98	13:41:19	7.12E+00	0:00:39	-0.64	38.6	0.64	0.0	0.00	-0.1945671
07/15/98	13:41:20	7.14E+00	0:00:40	-0.62	39.6	0.62	0.0	0.00	-0.2044676
07/15/98	13:41:21	7.15E+00	0:00:41	-0.61	40.6	0.61	0.0	0.00	-0.2121146
07/15/98	13:41:22	7.17E+00	0:00:42	-0.60	41.6	0.60	0.0	0.00	-0.2250453
07/15/98	13:41:23	7.18E+00	0:00:43	-0.58	42.6	0.58	0.0	0.00	-0.2329926
07/15/98	13:41:24	7.19E+00	0:00:44	-0.57	43.6	0.57	0.0	0.00	-0.2411638
07/15/98	13:41:25	7.20E+00	0:00:45	-0.56	44.6	0.56	0.0	0.00	-0.2494145
07/15/98	13:41:26	7.22E+00	0:00:46	-0.55	45.6	0.55	0.0	0.00	-0.260665
07/15/98	13:41:27	7.23E+00	0:00:47	-0.54	46.6	0.54	0.0	0.00	-0.2693792
07/15/98	13:41:28	7.24E+00	0:00:48	-0.52	47.6	0.52	0.0	0.00	-0.2841637
07/15/98	13:41:29	7.25E+00	0:00:49	-0.52	48.6	0.52	0.0	0.00	-0.287182
07/15/98	13:41:30	7.26E+00	0:00:50	-0.50	49.6	0.50	0.0	0.00	-0.2995559
07/15/98	13:41:31	7.27E+00	0:00:51	-0.49	50.6	0.49	0.0	0.00	-0.3058337
07/15/98	13:41:32	7.28E+00	0:00:52	-0.48	51.6	0.48	0.0	0.00	-0.3186683
07/15/98	13:41:33	7.29E+00	0:00:53	-0.47	52.6	0.47	0.0	0.00	-0.3285494
07/15/98	13:41:34	7.30E+00	0:00:54	-0.46	53.6	0.46	0.0	0.00	-0.335358
07/15/98	13:41:35	7.32E+00	0:00:55	-0.45	54.6	0.45	0.0	0.00	-0.3491099
07/15/98	13:41:36	7.32E+00	0:00:56	-0.44	55.6	0.44	0.0	0.00	-0.3561527
07/15/98	13:41:37	7.33E+00	0:00:57	-0.43	56.6	0.43	0.0	0.00	-0.3633116
07/15/98	13:41:38	7.34E+00	0:00:58	-0.42	57.6	0.42	0.0	0.00	-0.3743789
07/15/98	13:41:39	7.35E+00	0:00:59	-0.42	58.6	0.42	0.0	0.00	-0.3818473
07/15/98	13:41:40	7.36E+00	0:01:00	-0.40	59.6	0.40	0.0	0.00	-0.3932963
07/15/98	13:41:41	7.37E+00	0:01:01	-0.40	60.6	0.40	0.0	0.00	-0.4011001
07/15/98	13:41:42	7.37E+00	0:01:02	-0.39	61.6	0.39	0.0	0.00	-0.4091582
07/15/98	13:41:43	7.38E+00	0:01:03	-0.38	62.6	0.38	0.0	0.00	-0.4213608
07/15/98	13:41:44	7.39E+00	0:01:04	-0.37	63.6	0.37	0.0	0.00	-0.4296906
07/15/98	13:41:45	7.40E+00	0:01:05	-0.36	64.6	0.36	0.0	0.00	-0.4381833
07/15/98	13:41:47	7.40E+00	0:01:06	-0.36	65.9	0.36	0.0	0.00	-0.4424928
07/15/98	13:41:47	7.42E+00	0:01:07	-0.35	66.6	0.35	0.0	0.00	-0.4602968
07/15/98	13:41:48	7.42E+00	0:01:08	-0.35	67.6	0.35	0.0	0.00	-0.4602968
07/15/98	13:41:49	7.42E+00	0:01:09	-0.34	68.6	0.34	0.0	0.00	-0.4694161
07/15/98	13:41:50	7.44E+00	0:01:10	-0.33	69.6	0.33	0.0	0.00	-0.4834646
07/15/98	13:41:51	7.44E+00	0:01:11	-0.32	70.6	0.32	0.0	0.00	-0.4882503
07/15/98	13:41:52	7.45E+00	0:01:12	-0.32	71.6	0.32	0.0	0.00	-0.4979828

Page # 1 Terra8 Data File --> C:\TMP\946W10X

Date	Time	MW10 Slug In Analog#01 mw-10..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	13:41:53	7.45E+00	0:01:13	-0.31	72.6	0.31	0.0	0.00	-0.5030704
07/15/98	13:41:54	7.46E+00	0:01:14	-0.30	73.6	0.30	0.0	0.00	-0.5182708
07/15/98	13:41:55	7.47E+00	0:01:15	-0.30	74.6	0.30	0.0	0.00	-0.5287083
07/15/98	13:41:56	7.48E+00	0:01:16	-0.29	75.6	0.29	0.0	0.00	-0.5394028
07/15/98	13:41:57	7.48E+00	0:01:17	-0.29	76.6	0.29	0.0	0.00	-0.5448505
07/15/98	13:41:58	7.49E+00	0:01:18	-0.28	77.6	0.28	0.0	0.00	-0.5559552
07/15/98	13:41:59	7.49E+00	0:01:19	-0.27	78.6	0.27	0.0	0.00	-0.5617742
07/15/98	13:42:00	7.49E+00	0:01:20	-0.27	79.6	0.27	0.0	0.00	-0.5675117
07/15/98	13:42:01	7.50E+00	0:01:21	-0.26	80.6	0.26	0.0	0.00	-0.5792194
07/15/98	13:42:02	7.51E+00	0:01:22	-0.26	81.6	0.26	0.0	0.00	-0.5912514
07/15/98	13:42:03	7.51E+00	0:01:23	-0.25	82.7	0.25	0.0	0.00	-0.5973948
07/15/98	13:42:08	7.54E+00	0:01:28	-0.23	87.6	0.23	0.0	0.00	-0.6432095
07/15/98	13:42:13	7.56E+00	0:01:33	-0.20	92.6	0.20	0.0	0.00	-0.6942188
07/15/98	13:42:18	7.58E+00	0:01:38	-0.19	97.6	0.19	0.0	0.00	-0.7265357
07/15/98	13:42:23	7.60E+00	0:01:43	-0.17	102.6	0.17	0.0	0.00	-0.7796304
07/15/98	13:42:28	7.6122	0:01:48	-0.15	107.6	0.15	0.0	0.00	-0.8193008
07/15/98	13:42:33	7.6266	0:01:53	-0.14	112.6	0.14	0.0	0.00	-0.8626459
07/15/98	13:42:38	7.6374	0:01:58	-0.13	117.6	0.13	0.0	0.00	-0.8982529
07/15/98	13:42:43	7.6519	0:02:03	-0.11	122.6	0.11	0.0	0.00	-0.9511699
07/15/98	13:42:48	7.6555	0:02:08	-0.11	127.6	0.11	0.0	0.00	-0.9653715
07/15/98	13:42:53	7.6663	0:02:13	-0.10	132.6	0.10	0.0	0.00	-1.0109954
07/15/98	13:42:58	7.6771	0:02:18	-0.09	137.6	0.09	0.0	0.00	-1.0619809
07/15/98	13:43:03	7.6808	0:02:23	-0.08	142.6	0.08	0.0	0.00	-1.0809219
07/15/98	13:43:08	7.688	0:02:28	-0.08	147.6	0.08	0.0	0.00	-1.1203308
07/15/98	13:43:13	7.6988	0:02:33	-0.06	152.6	0.06	0.0	0.00	-1.1870866
07/15/98	13:43:18	7.6988	0:02:38	-0.06	157.6	0.06	0.0	0.00	-1.1870866
07/15/98	13:43:23	7.7096	0:02:43	-0.05	162.6	0.05	0.0	0.00	-1.2660007
07/15/98	13:43:28	7.7096	0:02:48	-0.05	167.6	0.05	0.0	0.00	-1.2660007
07/15/98	13:43:33	7.7132	0:02:53	-0.05	172.6	0.05	0.0	0.00	-1.2958495
07/15/98	13:43:38	7.7168	0:02:58	-0.05	177.6	0.05	0.0	0.00	-1.3279021
07/15/98	13:43:43	7.7168	0:03:03	-0.05	182.6	0.05	0.0	0.00	-1.3279021

Vernon Co. MW-11 Slug In



 Terra8 Data File --> C:\TMP\946W11A

MW11 Slug In

Date	Time	Analog#01 mw-11 ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	13:57:55	7.33	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
07/15/98	13:57:55	8.42	0:00:00	1.09	0.4	1.09	0.0	0.00	0.03889821
07/15/98	13:57:56	8.82	0:00:01	1.50	0.9	1.50	0.0	0.00	0.17548282
07/15/98	13:57:57	9.28	0:00:01	1.95	1.4	1.95	0.0	0.00	0.29063553
07/15/98	13:57:57	9.51	0:00:02	2.18	1.8	2.18	0.0	0.00	0.33919297
07/15/98	13:57:57	9.59	0:00:02	2.26	2.3	2.26	0.0	0.00	0.35401235
07/15/98	13:57:58	8.91	0:00:03	1.58	2.7	1.58	0.0	0.00	0.1989044
07/15/98	13:57:58	8.93	0:00:03	1.60	3.2	1.60	0.0	0.00	0.20482514
07/15/98	13:57:59	8.75	0:00:04	1.42	3.7	1.42	0.0	0.00	0.15293014
07/15/98	13:57:59	8.80	0:00:04	1.47	4.1	1.47	0.0	0.00	0.1670218
07/15/98	13:58:00	8.80	0:00:05	1.47	4.6	1.47	0.0	0.00	0.1670218
07/15/98	13:58:00	8.80	0:00:05	1.47	5.0	1.47	0.0	0.00	0.16811429
07/15/98	13:58:01	8.79	0:00:05	1.47	5.5	1.47	0.0	0.00	0.16595619
07/15/98	13:58:01	8.78	0:00:06	1.45	6.0	1.45	0.0	0.00	0.16166741
07/15/98	13:58:02	8.78	0:00:06	1.45	6.4	1.45	0.0	0.00	0.16274358
07/15/98	13:58:02	8.77	0:00:07	1.45	6.9	1.45	0.0	0.00	0.16058857
07/15/98	13:58:02	8.78	0:00:07	1.45	7.3	1.45	0.0	0.00	0.16166741
07/15/98	13:58:03	8.77	0:00:08	1.44	7.8	1.44	0.0	0.00	0.15950704
07/15/98	13:58:03	8.77	0:00:08	1.44	8.3	1.44	0.0	0.00	0.15950704
07/15/98	13:58:04	8.77	0:00:09	1.44	8.7	1.44	0.0	0.00	0.15842281
07/15/98	13:58:04	8.77	0:00:09	1.44	9.2	1.44	0.0	0.00	0.15842281
07/15/98	13:58:05	8.77	0:00:10	1.44	9.6	1.44	0.0	0.00	0.15842281
07/15/98	13:58:05	8.76	0:00:10	1.43	10.1	1.43	0.0	0.00	0.15624619
07/15/98	13:58:06	8.76	0:00:11	1.43	10.6	1.43	0.0	0.00	0.15512339
07/15/98	13:58:06	8.76	0:00:11	1.43	11.0	1.43	0.0	0.00	0.15512339
07/15/98	13:58:07	8.75	0:00:12	1.42	11.9	1.42	0.0	0.00	0.15182934
07/15/98	13:58:07	8.75	0:00:12	1.42	12.4	1.42	0.0	0.00	0.15182934
07/15/98	13:58:08	8.74	0:00:13	1.41	12.9	1.41	0.0	0.00	0.14961934
07/15/98	13:58:08	8.74	0:00:13	1.41	13.3	1.41	0.0	0.00	0.14961934
07/15/98	13:58:09	8.74	0:00:14	1.41	13.8	1.41	0.0	0.00	0.15072575
07/15/98	13:58:09	8.73	0:00:14	1.41	14.2	1.41	0.0	0.00	0.14851011
07/15/98	13:58:10	8.73	0:00:15	1.40	14.7	1.40	0.0	0.00	0.14739804
07/15/98	13:58:10	8.73	0:00:15	1.40	15.2	1.40	0.0	0.00	0.14739804
07/15/98	13:58:11	8.73	0:00:16	1.40	15.6	1.40	0.0	0.00	0.14739804
07/15/98	13:58:11	8.72	0:00:16	1.40	16.1	1.40	0.0	0.00	0.14516532
07/15/98	13:58:12	8.72	0:00:16	1.39	16.5	1.39	0.0	0.00	0.14404464
07/15/98	13:58:12	8.72	0:00:17	1.39	17.0	1.39	0.0	0.00	0.14404464
07/15/98	13:58:13	8.72	0:00:17	1.39	17.5	1.39	0.0	0.00	0.14288981
07/15/98	13:58:13	8.71	0:00:18	1.39	17.9	1.39	0.0	0.00	0.14176323
07/15/98	13:58:14	8.72	0:00:18	1.39	18.4	1.39	0.0	0.00	0.14288981
07/15/98	13:58:14	8.71	0:00:19	1.39	18.8	1.39	0.0	0.00	0.14176323
07/15/98	13:58:14	8.71	0:00:19	1.38	19.3	1.38	0.0	0.00	0.13950127
07/15/98	13:58:16	8.70	0:00:20	1.37	20.4	1.37	0.0	0.00	0.13722748
07/15/98	13:58:16	8.70	0:00:21	1.37	20.9	1.37	0.0	0.00	0.13722748
07/15/98	13:58:16	8.69	0:00:21	1.36	21.3	1.36	0.0	0.00	0.13494171
07/15/98	13:58:17	8.69	0:00:22	1.36	21.8	1.36	0.0	0.00	0.1337943
07/15/98	13:58:17	8.68	0:00:22	1.36	22.3	1.36	0.0	0.00	0.13264385
07/15/98	13:58:18	8.68	0:00:23	1.35	22.7	1.35	0.0	0.00	0.13145826
07/15/98	13:58:18	8.68	0:00:23	1.35	23.2	1.35	0.0	0.00	0.13145826

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MW11 Slug In

Date	Time	Analog#01 mw-11 ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	13:58:19	8.68	0:00:24	1.35	23.6	1.35	0.0	0.00	0.1303016
07/15/98	13:58:19	8.67	0:00:24	1.35	24.2	1.35	0.0	0.00	0.12914185
07/15/98	13:58:20	8.67	0:00:25	1.34	25.2	1.34	0.0	0.00	0.12797899
07/15/98	13:58:21	8.67	0:00:26	1.34	26.2	1.34	0.0	0.00	0.12681301
07/15/98	13:58:22	8.66	0:00:27	1.34	27.2	1.34	0.0	0.00	0.12564389
07/15/98	13:58:23	8.65	0:00:28	1.32	28.2	1.32	0.0	0.00	0.12211754
07/15/98	13:58:24	8.65	0:00:29	1.32	29.2	1.32	0.0	0.00	0.12093569
07/15/98	13:58:25	8.63	0:00:30	1.31	30.2	1.31	0.0	0.00	0.11614265
07/15/98	13:58:26	8.63	0:00:31	1.31	31.2	1.31	0.0	0.00	0.11614265
07/15/98	13:58:27	8.63	0:00:32	1.31	32.2	1.31	0.0	0.00	0.11614265
07/15/98	13:58:28	8.63	0:00:33	1.30	33.2	1.30	0.0	0.00	0.11374286
07/15/98	13:58:29	8.62	0:00:34	1.29	34.2	1.29	0.0	0.00	0.11011813
07/15/98	13:58:30	8.61	0:00:35	1.29	35.2	1.29	0.0	0.00	0.10890313
07/15/98	13:58:31	8.61	0:00:36	1.28	36.2	1.28	0.0	0.00	0.10768472
07/15/98	13:58:32	8.60	0:00:37	1.27	37.2	1.27	0.0	0.00	0.10397467
07/15/98	13:58:33	8.59	0:00:38	1.27	38.2	1.27	0.0	0.00	0.10274234
07/15/98	13:58:34	8.59	0:00:39	1.26	39.2	1.26	0.0	0.00	0.1015065
07/15/98	13:58:35	8.58	0:00:40	1.26	40.2	1.26	0.0	0.00	0.09902422
07/15/98	13:58:36	8.58	0:00:41	1.25	41.2	1.25	0.0	0.00	0.09777773
07/15/98	13:58:37	8.57	0:00:42	1.25	42.2	1.25	0.0	0.00	0.09527399
07/15/98	13:58:38	8.57	0:00:43	1.24	43.2	1.24	0.0	0.00	0.09401668
07/15/98	13:58:39	8.57	0:00:44	1.24	44.2	1.24	0.0	0.00	0.09272064
07/15/98	13:58:40	8.56	0:00:45	1.23	45.2	1.23	0.0	0.00	0.09018749
07/15/98	13:58:41	8.56	0:00:46	1.23	46.2	1.23	0.0	0.00	0.09018749
07/15/98	13:58:42	8.55	0:00:47	1.22	47.2	1.22	0.0	0.00	0.08763947
07/15/98	13:58:43	8.54	0:00:48	1.22	48.2	1.22	0.0	0.00	0.08507641
07/15/98	13:58:44	8.54	0:00:49	1.21	49.2	1.21	0.0	0.00	0.08378919
07/15/98	13:58:45	8.53	0:00:50	1.21	50.2	1.21	0.0	0.00	0.08120324
07/15/98	13:58:46	8.53	0:00:51	1.20	51.2	1.20	0.0	0.00	0.07856556
07/15/98	13:58:48	8.52	0:00:53	1.19	53.2	1.19	0.0	0.00	0.07594822
07/15/98	13:58:49	8.51	0:00:54	1.18	54.2	1.18	0.0	0.00	0.07331502
07/15/98	13:58:50	8.51	0:00:55	1.18	55.2	1.18	0.0	0.00	0.07199241
07/15/98	13:58:51	8.50	0:00:56	1.17	56.2	1.17	0.0	0.00	0.06933503
07/15/98	13:58:52	8.50	0:00:57	1.17	57.2	1.17	0.0	0.00	0.06800023
07/15/98	13:58:53	8.49	0:00:58	1.16	58.2	1.16	0.0	0.00	0.06531824
07/15/98	13:58:54	8.49	0:00:59	1.16	59.2	1.16	0.0	0.00	0.06531824
07/15/98	13:58:55	8.48	0:01:00	1.16	60.2	1.16	0.0	0.00	0.06258198
07/15/98	13:58:56	8.47	0:01:01	1.15	61.2	1.15	0.0	0.00	0.05986622
07/15/98	13:58:57	8.47	0:01:02	1.14	62.2	1.14	0.0	0.00	0.05850194
07/15/98	13:58:58	8.47	0:01:03	1.14	63.2	1.14	0.0	0.00	0.05713337
07/15/98	13:58:59	8.46	0:01:04	1.14	64.2	1.14	0.0	0.00	0.05576046
07/15/98	13:59:01	8.45	0:01:05	1.13	65.5	1.13	0.0	0.00	0.05161552
07/15/98	13:59:01	8.45	0:01:06	1.13	66.2	1.13	0.0	0.00	0.05161552
07/15/98	13:59:02	8.44	0:01:07	1.12	67.2	1.12	0.0	0.00	0.0473917
07/15/98	13:59:03	8.44	0:01:08	1.11	68.2	1.11	0.0	0.00	0.04598761
07/15/98	13:59:04	8.44	0:01:09	1.11	69.2	1.11	0.0	0.00	0.04457895
07/15/98	13:59:05	8.43	0:01:10	1.10	70.2	1.10	0.0	0.00	0.04316572
07/15/98	13:59:06	8.42	0:01:11	1.10	71.2	1.10	0.0	0.00	0.04032538
07/15/98	13:59:07	8.42	0:01:12	1.09	72.2	1.09	0.0	0.00	0.03889821

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MW11 Slug In

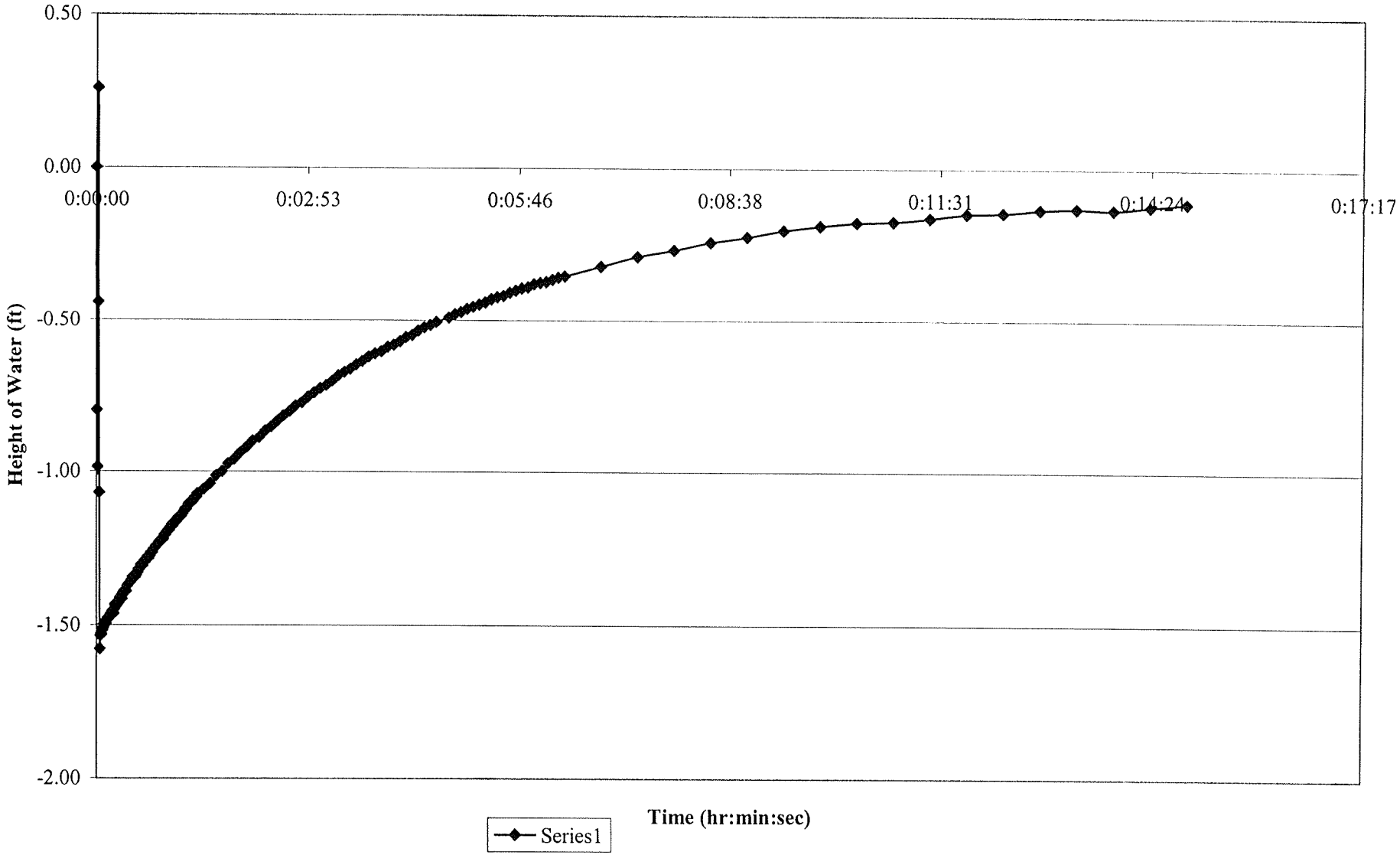
Date	Time	Analog#01 mw-11 ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	13:59:08	8.42	0:01:13	1.09	73.2	1.09	0.0	0.00	0.03746634
07/15/98	13:59:09	8.41	0:01:14	1.08	74.2	1.08	0.0	0.00	0.03454825
07/15/98	13:59:10	8.41	0:01:15	1.08	75.2	1.08	0.0	0.00	0.03454825
07/15/98	13:59:11	8.40	0:01:16	1.08	76.2	1.08	0.0	0.00	0.03165079
07/15/98	13:59:12	8.40	0:01:17	1.07	77.2	1.07	0.0	0.00	0.02873388
07/15/98	13:59:13	8.40	0:01:18	1.07	78.2	1.07	0.0	0.00	0.02873388
07/15/98	13:59:14	8.38	0:01:19	1.06	79.2	1.06	0.0	0.00	0.02432144
07/15/98	13:59:15	8.38	0:01:20	1.06	80.2	1.06	0.0	0.00	0.02432144
07/15/98	13:59:16	8.38	0:01:21	1.05	81.2	1.05	0.0	0.00	0.02284061
07/15/98	13:59:17	8.38	0:01:22	1.05	82.2	1.05	0.0	0.00	0.02135471
07/15/98	13:59:18	8.37	0:01:23	1.04	83.2	1.04	0.0	0.00	0.01832595
07/15/98	13:59:19	8.37	0:01:24	1.04	84.3	1.04	0.0	0.00	0.01682449
07/15/98	13:59:24	8.34	0:01:29	1.02	89.2	1.02	0.0	0.00	0.00770511
07/15/98	13:59:29	8.32	0:01:34	1.00	94.2	1.00	0.0	0.00	-0.0016535
07/15/98	13:59:34	8.31	0:01:39	0.98	99.2	0.98	0.0	0.00	-0.0095723
07/15/98	13:59:39	8.28	0:01:44	0.95	104.2	0.95	0.0	0.00	-0.0209527
07/15/98	13:59:44	8.26	0:01:49	0.93	109.2	0.93	0.0	0.00	-0.0292348
07/15/98	13:59:49	8.25	0:01:54	0.92	114.2	0.92	0.0	0.00	-0.0360234
07/15/98	13:59:54	8.22	0:01:59	0.90	119.2	0.90	0.0	0.00	-0.0480799
07/15/98	13:59:59	8.20	0:02:04	0.87	124.2	0.87	0.0	0.00	-0.0587371
07/15/98	14:00:04	8.19	0:02:09	0.86	129.2	0.86	0.0	0.00	-0.0641402
07/15/98	14:00:09	8.16	0:02:14	0.84	134.2	0.84	0.0	0.00	-0.077067
07/15/98	14:00:14	8.15	0:02:19	0.82	139.2	0.82	0.0	0.00	-0.086504
07/15/98	14:00:19	8.13	0:02:24	0.80	144.2	0.80	0.0	0.00	-0.0962049
07/15/98	14:00:24	8.11	0:02:29	0.79	149.2	0.79	0.0	0.00	-0.1040805
07/15/98	14:00:29	8.10	0:02:34	0.77	154.2	0.77	0.0	0.00	-0.1141866
07/15/98	14:00:34	8.08	0:02:39	0.75	159.2	0.75	0.0	0.00	-0.1223983
07/15/98	14:00:39	8.06	0:02:44	0.73	164.2	0.73	0.0	0.00	-0.1350738
07/15/98	14:00:44	8.05	0:02:49	0.72	169.2	0.72	0.0	0.00	-0.1436941
07/15/98	14:00:49	8.03	0:02:54	0.70	174.2	0.70	0.0	0.00	-0.1547159
07/15/98	14:00:54	8.01	0:02:59	0.69	179.2	0.69	0.0	0.00	-0.1638025
07/15/98	14:00:59	8.00	0:03:04	0.67	184.2	0.67	0.0	0.00	-0.1730187
07/15/98	14:01:04	7.98	0:03:09	0.66	189.2	0.66	0.0	0.00	-0.1825007
07/15/98	14:01:14	7.96	0:03:19	0.63	199.2	0.63	0.0	0.00	-0.2019712
07/15/98	14:01:19	7.94	0:03:24	0.61	204.2	0.61	0.0	0.00	-0.2121146
07/15/98	14:01:24	7.93	0:03:29	0.60	209.2	0.60	0.0	0.00	-0.2224282
07/15/98	14:01:29	7.91	0:03:34	0.58	214.2	0.58	0.0	0.00	-0.2329926
07/15/98	14:01:34	7.90	0:03:39	0.58	219.2	0.58	0.0	0.00	-0.238448
07/15/98	14:01:39	7.89	0:03:44	0.56	224.2	0.56	0.0	0.00	-0.2521999
07/15/98	14:01:44	7.88	0:03:49	0.55	229.2	0.55	0.0	0.00	-0.260665
07/15/98	14:01:49	7.86	0:03:54	0.54	234.2	0.54	0.0	0.00	-0.2693792
07/15/98	14:01:54	7.85	0:03:59	0.53	239.2	0.53	0.0	0.00	-0.2781894
07/15/98	14:01:59	7.85	0:04:04	0.52	244.2	0.52	0.0	0.00	-0.2841637
07/15/98	14:02:04	7.83	0:04:09	0.51	249.2	0.51	0.0	0.00	-0.2964507
07/15/98	14:02:09	7.82	0:04:14	0.49	254.2	0.49	0.0	0.00	-0.309007
07/15/98	14:02:14	7.80	0:04:19	0.47	259.2	0.47	0.0	0.00	-0.3252307
07/15/98	14:02:19	7.79	0:04:24	0.47	264.2	0.47	0.0	0.00	-0.331987
07/15/98	14:02:24	7.79	0:04:29	0.46	269.2	0.46	0.0	0.00	-0.3387554
07/15/98	14:02:29	7.77	0:04:34	0.45	274.2	0.45	0.0	0.00	-0.3491099

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MW11 Slug In

Date	Time	Analog#01 mw-11 ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	14:02:34	7.76	0:04:39	0.44	279.2	0.44	0.0	0.00	-0.3597174
07/15/98	14:02:39	7.75	0:04:44	0.43	284.2	0.43	0.0	0.00	-0.3706924
07/15/98	14:02:44	7.75	0:04:49	0.42	289.2	0.42	0.0	0.00	-0.378097
07/15/98	14:02:49	7.73	0:04:54	0.41	294.2	0.41	0.0	0.00	-0.3894463
07/15/98	14:02:54	7.73	0:04:59	0.40	299.2	0.40	0.0	0.00	-0.3971807
07/15/98	14:02:59	7.71	0:05:04	0.39	304.2	0.39	0.0	0.00	-0.4131877
07/15/98	14:03:04	7.71	0:05:09	0.38	309.2	0.38	0.0	0.00	-0.4213608
07/15/98	14:03:09	7.70	0:05:14	0.37	314.2	0.37	0.0	0.00	-0.4296906
07/15/98	14:03:14	7.68	0:05:19	0.36	319.2	0.36	0.0	0.00	-0.4468455
07/15/98	14:03:19	7.68	0:05:24	0.35	324.2	0.35	0.0	0.00	-0.4512422
07/15/98	14:03:24	7.67	0:05:29	0.34	329.2	0.34	0.0	0.00	-0.4648325
07/15/98	14:03:29	7.66	0:05:34	0.34	334.2	0.34	0.0	0.00	-0.4740487
07/15/98	14:03:34	7.66	0:05:39	0.33	339.2	0.33	0.0	0.00	-0.4834646
07/15/98	14:03:39	7.65	0:05:44	0.32	344.2	0.32	0.0	0.00	-0.4930893
07/15/98	14:03:44	7.64	0:05:49	0.31	349.2	0.31	0.0	0.00	-0.5030704
07/15/98	14:03:49	7.63	0:05:54	0.31	354.2	0.31	0.0	0.00	-0.5131446
07/15/98	14:03:54	7.62	0:05:59	0.29	359.2	0.29	0.0	0.00	-0.5340226
07/15/98	14:03:59	7.62	0:06:04	0.29	364.2	0.29	0.0	0.00	-0.5340226
07/15/98	14:04:04	7.61	0:06:09	0.28	369.2	0.28	0.0	0.00	-0.5503673
07/15/98	14:04:09	7.61	0:06:14	0.28	374.2	0.28	0.0	0.00	-0.5559552
07/15/98	14:04:14	7.60	0:06:19	0.27	379.2	0.27	0.0	0.00	-0.5675117
07/15/98	14:04:19	7.59	0:06:24	0.26	384.3	0.26	0.0	0.00	-0.5792194
07/15/98	14:04:49	7.55	0:06:54	0.22	414.2	0.22	0.0	0.00	-0.6501399
07/15/98	14:05:19	7.52	0:07:24	0.19	444.2	0.19	0.0	0.00	-0.7101882
07/15/98	14:05:49	7.49	0:07:54	0.16	474.2	0.16	0.0	0.00	-0.7891466
07/15/98	14:06:19	7.47	0:08:24	0.14	504.2	0.14	0.0	0.00	-0.8513973
07/15/98	14:06:49	7.44	0:08:54	0.12	534.2	0.12	0.0	0.00	-0.937418
07/15/98	14:07:19	7.42	0:09:24	0.10	564.2	0.10	0.0	0.00	-1.0109954
07/15/98	14:07:49	7.41	0:09:54	0.08	594.2	0.08	0.0	0.00	-1.1001795

Vernon Co. MW-11 Slug Out



08/26/2003

946W11B.xls MW11b graph

MW11 Slug Out

Date	Time	Analog#01 mw-11..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	14:11:00	7.33	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
07/15/98	14:11:00	6.53	0:00:00	-0.80	0.4	0.80	0.0	0.00	-0.0982149
07/15/98	14:11:01	6.35	0:00:01	-0.99	0.9	0.99	0.0	0.00	-0.0064315
07/15/98	14:11:01	7.59	0:00:01	0.26	1.3	0.26	0.0	0.00	-0.5851937
07/15/98	14:11:02	6.89	0:00:02	-0.44	1.8	0.44	0.0	0.00	-0.3562513
07/15/98	14:11:02	6.26	0:00:02	-1.07	2.3	1.07	0.0	0.00	0.02869323
07/15/98	14:11:03	5.75	0:00:03	-1.58	2.7	1.58	0.0	0.00	0.1979143
07/15/98	14:11:03	5.80	0:00:03	-1.53	3.2	1.53	0.0	0.00	0.18579705
07/15/98	14:11:04	5.80	0:00:04	-1.53	3.7	1.53	0.0	0.00	0.18375371
07/15/98	14:11:04	5.80	0:00:04	-1.53	4.1	1.53	0.0	0.00	0.18477658
07/15/98	14:11:04	5.81	0:00:05	-1.52	4.6	1.52	0.0	0.00	0.18067055
07/15/98	14:11:05	5.81	0:00:05	-1.52	5.0	1.52	0.0	0.00	0.18067055
07/15/98	14:11:05	5.82	0:00:05	-1.51	5.5	1.51	0.0	0.00	0.17860289
07/15/98	14:11:06	5.83	0:00:06	-1.50	6.0	1.50	0.0	0.00	0.17545383
07/15/98	14:11:06	5.83	0:00:06	-1.50	6.4	1.50	0.0	0.00	0.17652534
07/15/98	14:11:07	5.84	0:00:07	-1.49	6.9	1.49	0.0	0.00	0.17440873
07/15/98	14:11:07	5.83	0:00:07	-1.50	7.3	1.50	0.0	0.00	0.17545383
07/15/98	14:11:08	5.84	0:00:08	-1.49	7.8	1.49	0.0	0.00	0.17440873
07/15/98	14:11:08	5.85	0:00:08	-1.48	8.3	1.48	0.0	0.00	0.17125827
07/15/98	14:11:09	5.85	0:00:09	-1.48	8.7	1.48	0.0	0.00	0.17125827
07/15/98	14:11:09	5.85	0:00:09	-1.48	9.2	1.48	0.0	0.00	0.1691452
07/15/98	14:11:09	5.85	0:00:10	-1.48	9.6	1.48	0.0	0.00	0.1691452
07/15/98	14:11:10	5.86	0:00:10	-1.47	10.1	1.47	0.0	0.00	0.1680848
07/15/98	14:11:10	5.85	0:00:11	-1.48	10.6	1.48	0.0	0.00	0.1691452
07/15/98	14:11:11	5.86	0:00:11	-1.47	11.0	1.47	0.0	0.00	0.1670218
07/15/98	14:11:11	5.87	0:00:11	-1.47	11.5	1.47	0.0	0.00	0.16595619
07/15/98	14:11:12	5.87	0:00:12	-1.46	11.9	1.46	0.0	0.00	0.16488796
07/15/98	14:11:12	5.87	0:00:12	-1.46	12.4	1.46	0.0	0.00	0.16488796
07/15/98	14:11:13	5.88	0:00:13	-1.45	12.9	1.45	0.0	0.00	0.16271373
07/15/98	14:11:13	5.87	0:00:13	-1.46	13.3	1.46	0.0	0.00	0.16488796
07/15/98	14:11:14	5.88	0:00:14	-1.45	13.8	1.45	0.0	0.00	0.16163748
07/15/98	14:11:14	5.87	0:00:14	-1.46	14.2	1.46	0.0	0.00	0.16488796
07/15/98	14:11:15	5.88	0:00:15	-1.45	14.7	1.45	0.0	0.00	0.16055856
07/15/98	14:11:15	5.90	0:00:15	-1.43	15.2	1.43	0.0	0.00	0.15621588
07/15/98	14:11:16	5.89	0:00:16	-1.44	15.6	1.44	0.0	0.00	0.15730563
07/15/98	14:11:16	5.90	0:00:16	-1.43	16.1	1.43	0.0	0.00	0.15621588
07/15/98	14:11:16	5.89	0:00:17	-1.44	16.6	1.44	0.0	0.00	0.15730563
07/15/98	14:11:17	5.90	0:00:17	-1.43	17.0	1.43	0.0	0.00	0.15621588
07/15/98	14:11:17	5.90	0:00:17	-1.43	17.5	1.43	0.0	0.00	0.15402815
07/15/98	14:11:18	5.91	0:00:18	-1.42	17.9	1.42	0.0	0.00	0.15293014
07/15/98	14:11:18	5.90	0:00:18	-1.43	18.4	1.43	0.0	0.00	0.15402815
07/15/98	14:11:19	5.92	0:00:19	-1.41	19.3	1.41	0.0	0.00	0.14958857
07/15/98	14:11:20	5.92	0:00:20	-1.41	19.8	1.41	0.0	0.00	0.14847926
07/15/98	14:11:20	5.92	0:00:20	-1.41	20.2	1.41	0.0	0.00	0.14847926
07/15/98	14:11:21	5.92	0:00:21	-1.41	20.7	1.41	0.0	0.00	0.15069505
07/15/98	14:11:21	5.93	0:00:21	-1.40	21.2	1.40	0.0	0.00	0.1462521
07/15/98	14:11:21	5.93	0:00:22	-1.40	21.6	1.40	0.0	0.00	0.14513423
07/15/98	14:11:22	5.94	0:00:22	-1.39	22.1	1.39	0.0	0.00	0.14401347
07/15/98	14:11:23	5.94	0:00:23	-1.39	22.6	1.39	0.0	0.00	0.14288981

 Terra8 Data File --> C:\TMP\946W11B

MW11 Slug Out

Date	Time	Analog#01 mw-11..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	14:11:23	5.94	0:00:23	-1.39	23.4	1.39	0.0	0.00	0.14176323
07/15/98	14:11:24	5.94	0:00:24	-1.39	24.4	1.39	0.0	0.00	0.14288981
07/15/98	14:11:25	5.96	0:00:25	-1.37	25.4	1.37	0.0	0.00	0.13719581
07/15/98	14:11:26	5.97	0:00:26	-1.36	26.4	1.36	0.0	0.00	0.13490988
07/15/98	14:11:27	5.97	0:00:27	-1.36	27.4	1.36	0.0	0.00	0.13376238
07/15/98	14:11:28	5.98	0:00:28	-1.35	28.4	1.35	0.0	0.00	0.13145826
07/15/98	14:11:29	5.99	0:00:29	-1.34	29.4	1.34	0.0	0.00	0.12794664
07/15/98	14:11:31	5.98	0:00:31	-1.35	30.7	1.35	0.0	0.00	0.12914185
07/15/98	14:11:31	5.99	0:00:31	-1.34	31.4	1.34	0.0	0.00	0.12794664
07/15/98	14:11:32	6.00	0:00:32	-1.34	32.4	1.34	0.0	0.00	0.12561137
07/15/98	14:11:33	6.00	0:00:33	-1.33	33.4	1.33	0.0	0.00	0.12326348
07/15/98	14:11:34	6.01	0:00:34	-1.32	34.4	1.32	0.0	0.00	0.11971766
07/15/98	14:11:35	6.02	0:00:35	-1.31	35.4	1.31	0.0	0.00	0.11852926
07/15/98	14:11:36	6.03	0:00:36	-1.30	36.4	1.30	0.0	0.00	0.11491108
07/15/98	14:11:37	6.02	0:00:37	-1.31	37.4	1.31	0.0	0.00	0.11614265
07/15/98	14:11:38	6.03	0:00:38	-1.30	38.4	1.30	0.0	0.00	0.11250446
07/15/98	14:11:39	6.04	0:00:39	-1.29	39.4	1.29	0.0	0.00	0.11008442
07/15/98	14:11:40	6.04	0:00:40	-1.29	40.4	1.29	0.0	0.00	0.11008442
07/15/98	14:11:41	6.05	0:00:41	-1.28	41.4	1.28	0.0	0.00	0.10642889
07/15/98	14:11:42	6.05	0:00:42	-1.28	42.4	1.28	0.0	0.00	0.10765083
07/15/98	14:11:43	6.06	0:00:43	-1.27	43.4	1.27	0.0	0.00	0.10520352
07/15/98	14:11:44	6.07	0:00:44	-1.26	44.4	1.26	0.0	0.00	0.10147212
07/15/98	14:11:45	6.07	0:00:45	-1.26	45.4	1.26	0.0	0.00	0.10147212
07/15/98	14:11:46	6.08	0:00:46	-1.25	46.4	1.25	0.0	0.00	0.09774306
07/15/98	14:11:47	6.08	0:00:47	-1.25	47.4	1.25	0.0	0.00	0.09649289
07/15/98	14:11:48	6.09	0:00:48	-1.24	48.4	1.24	0.0	0.00	0.0939817
07/15/98	14:11:49	6.09	0:00:49	-1.24	49.4	1.24	0.0	0.00	0.09272064
07/15/98	14:11:50	6.10	0:00:50	-1.23	50.4	1.23	0.0	0.00	0.09145591
07/15/98	14:11:51	6.10	0:00:51	-1.23	51.4	1.23	0.0	0.00	0.08887996
07/15/98	14:11:52	6.10	0:00:52	-1.23	52.4	1.23	0.0	0.00	0.08887996
07/15/98	14:11:53	6.11	0:00:53	-1.22	53.4	1.22	0.0	0.00	0.08632423
07/15/98	14:11:54	6.11	0:00:54	-1.22	54.4	1.22	0.0	0.00	0.08632423
07/15/98	14:11:55	6.13	0:00:55	-1.21	55.4	1.21	0.0	0.00	0.08116721
07/15/98	14:11:56	6.13	0:00:56	-1.21	56.4	1.21	0.0	0.00	0.08116721
07/15/98	14:11:57	6.13	0:00:57	-1.20	57.4	1.20	0.0	0.00	0.07856556
07/15/98	14:11:58	6.14	0:00:58	-1.19	58.4	1.19	0.0	0.00	0.07594822
07/15/98	14:11:59	6.14	0:00:59	-1.19	59.4	1.19	0.0	0.00	0.07594822
07/15/98	14:12:00	6.15	0:01:00	-1.18	60.4	1.18	0.0	0.00	0.07195561
07/15/98	14:12:01	6.16	0:01:01	-1.17	61.4	1.17	0.0	0.00	0.06929801
07/15/98	14:12:02	6.15	0:01:02	-1.18	62.4	1.18	0.0	0.00	0.07062884
07/15/98	14:12:03	6.16	0:01:03	-1.17	63.4	1.17	0.0	0.00	0.06796309
07/15/98	14:12:04	6.17	0:01:04	-1.16	64.4	1.16	0.0	0.00	0.06528087
07/15/98	14:12:05	6.17	0:01:05	-1.16	65.4	1.16	0.0	0.00	0.06528087
07/15/98	14:12:06	6.18	0:01:06	-1.15	66.4	1.15	0.0	0.00	0.0611885
07/15/98	14:12:07	6.18	0:01:07	-1.15	67.4	1.15	0.0	0.00	0.0611885
07/15/98	14:12:09	6.19	0:01:09	-1.14	69.4	1.14	0.0	0.00	0.05846399
07/15/98	14:12:10	6.19	0:01:10	-1.14	70.4	1.14	0.0	0.00	0.05572227
07/15/98	14:12:11	6.20	0:01:11	-1.13	71.4	1.13	0.0	0.00	0.05296313
07/15/98	14:12:12	6.21	0:01:12	-1.12	72.4	1.12	0.0	0.00	0.05018635

 Terra8 Data File --> C:\TMP\946W11B

MW11 Slug Out

Date	Time	Analog#01 mw-11..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	14:12:13	6.21	0:01:13	-1.12	73.4	1.12	0.0	0.00	0.05018635
07/15/98	14:12:15	6.22	0:01:15	-1.11	74.7	1.11	0.0	0.00	0.04594854
07/15/98	14:12:15	6.23	0:01:15	-1.10	75.4	1.10	0.0	0.00	0.0431264
07/15/98	14:12:16	6.23	0:01:16	-1.10	76.4	1.10	0.0	0.00	0.04170842
07/15/98	14:12:17	6.23	0:01:17	-1.10	77.4	1.10	0.0	0.00	0.0402858
07/15/98	14:12:18	6.23	0:01:18	-1.10	78.4	1.10	0.0	0.00	0.0402858
07/15/98	14:12:19	6.24	0:01:19	-1.09	79.4	1.09	0.0	0.00	0.0374265
07/15/98	14:12:20	6.25	0:01:20	-1.08	80.4	1.08	0.0	0.00	0.03454825
07/15/98	14:12:21	6.25	0:01:21	-1.08	81.4	1.08	0.0	0.00	0.03454825
07/15/98	14:12:22	6.26	0:01:22	-1.07	82.5	1.07	0.0	0.00	0.03015427
07/15/98	14:12:27	6.27	0:01:27	-1.06	87.4	1.06	0.0	0.00	0.02428038
07/15/98	14:12:32	6.29	0:01:32	-1.04	92.4	1.04	0.0	0.00	0.01682449
07/15/98	14:12:37	6.32	0:01:37	-1.01	97.4	1.01	0.0	0.00	0.00612361
07/15/98	14:12:42	6.33	0:01:42	-1.00	102.4	1.00	0.0	0.00	-8.687E-05
07/15/98	14:12:47	6.36	0:01:47	-0.97	107.4	0.97	0.0	0.00	-0.0112182
07/15/98	14:12:52	6.37	0:01:52	-0.96	112.4	0.96	0.0	0.00	-0.0176835
07/15/98	14:12:57	6.39	0:01:57	-0.94	117.4	0.94	0.0	0.00	-0.027612
07/15/98	14:13:02	6.41	0:02:02	-0.92	122.4	0.92	0.0	0.00	-0.0360706
07/15/98	14:13:07	6.43	0:02:07	-0.90	127.4	0.90	0.0	0.00	-0.0463853
07/15/98	14:13:12	6.44	0:02:12	-0.89	132.4	0.89	0.0	0.00	-0.0516359
07/15/98	14:13:17	6.46	0:02:17	-0.87	137.4	0.87	0.0	0.00	-0.0623818
07/15/98	14:13:22	6.48	0:02:22	-0.85	142.4	0.85	0.0	0.00	-0.0696624
07/15/98	14:13:27	6.50	0:02:27	-0.83	147.4	0.83	0.0	0.00	-0.0789902
07/15/98	14:13:32	6.51	0:02:32	-0.82	152.4	0.82	0.0	0.00	-0.0884695
07/15/98	14:13:37	6.53	0:02:37	-0.80	157.4	0.80	0.0	0.00	-0.0962591
07/15/98	14:13:42	6.55	0:02:42	-0.78	162.4	0.78	0.0	0.00	-0.1061273
07/15/98	14:13:47	6.56	0:02:47	-0.77	167.4	0.77	0.0	0.00	-0.1121577
07/15/98	14:13:52	6.58	0:02:52	-0.75	172.4	0.75	0.0	0.00	-0.1224559
07/15/98	14:13:57	6.59	0:02:57	-0.74	177.4	0.74	0.0	0.00	-0.130827
07/15/98	14:14:02	6.61	0:03:02	-0.73	182.4	0.73	0.0	0.00	-0.1394224
07/15/98	14:14:07	6.62	0:03:07	-0.71	187.4	0.71	0.0	0.00	-0.145937
07/15/98	14:14:12	6.63	0:03:12	-0.70	192.4	0.70	0.0	0.00	-0.1547779
07/15/98	14:14:17	6.65	0:03:17	-0.68	197.4	0.68	0.0	0.00	-0.166152
07/15/98	14:14:22	6.66	0:03:22	-0.67	202.4	0.67	0.0	0.00	-0.1730834
07/15/98	14:14:27	6.67	0:03:27	-0.66	207.4	0.66	0.0	0.00	-0.1801272
07/15/98	14:14:32	6.68	0:03:32	-0.65	212.4	0.65	0.0	0.00	-0.1897675
07/15/98	14:14:37	6.70	0:03:37	-0.64	217.4	0.64	0.0	0.00	-0.1970895
07/15/98	14:14:42	6.71	0:03:42	-0.62	222.4	0.62	0.0	0.00	-0.2070483
07/15/98	14:14:47	6.72	0:03:47	-0.61	227.4	0.61	0.0	0.00	-0.2147414
07/15/98	14:14:52	6.73	0:03:52	-0.60	232.4	0.60	0.0	0.00	-0.2198988
07/15/98	14:14:57	6.74	0:03:57	-0.59	237.4	0.59	0.0	0.00	-0.2304012
07/15/98	14:15:02	6.75	0:04:02	-0.58	242.4	0.58	0.0	0.00	-0.2357491
07/15/98	14:15:07	6.76	0:04:07	-0.57	247.4	0.57	0.0	0.00	-0.2439728
07/15/98	14:15:12	6.77	0:04:12	-0.56	252.4	0.56	0.0	0.00	-0.2550815
07/15/98	14:15:17	6.78	0:04:17	-0.55	257.4	0.55	0.0	0.00	-0.2607442
07/15/98	14:15:22	6.80	0:04:22	-0.53	262.4	0.53	0.0	0.00	-0.2723774
07/15/98	14:15:27	6.81	0:04:27	-0.52	267.4	0.52	0.0	0.00	-0.2812493
07/15/98	14:15:32	6.81	0:04:32	-0.52	272.4	0.52	0.0	0.00	-0.2872661
07/15/98	14:15:37	6.83	0:04:37	-0.51	277.4	0.51	0.0	0.00	-0.2964507

 Terra8 Data File --> C:\TMP\946W11B

MW11 Slug Out

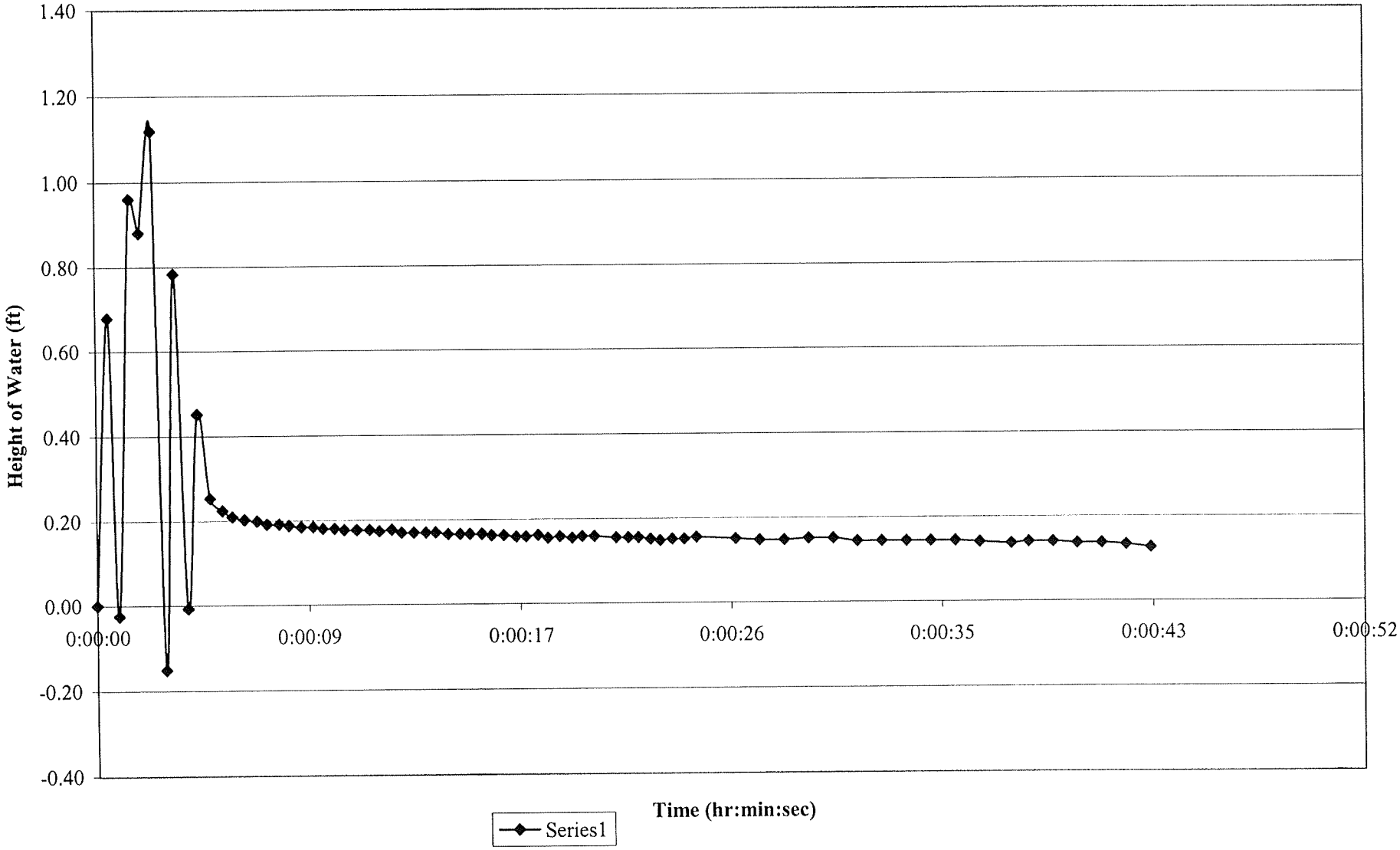
Date	Time	Analog#01 mw-11..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	14:15:47	6.84	0:04:47	-0.49	287.4	0.49	0.0	0.00	-0.3090954
07/15/98	14:15:52	6.85	0:04:52	-0.48	292.4	0.48	0.0	0.00	-0.3187588
07/15/98	14:15:57	6.86	0:04:57	-0.47	297.4	0.47	0.0	0.00	-0.3253225
07/15/98	14:16:02	6.87	0:05:02	-0.46	302.4	0.46	0.0	0.00	-0.335358
07/15/98	14:16:07	6.88	0:05:07	-0.45	307.4	0.45	0.0	0.00	-0.342275
07/15/98	14:16:12	6.88	0:05:12	-0.45	312.4	0.45	0.0	0.00	-0.349207
07/15/98	14:16:17	6.89	0:05:17	-0.44	317.4	0.44	0.0	0.00	-0.3562513
07/15/98	14:16:22	6.90	0:05:22	-0.43	322.4	0.43	0.0	0.00	-0.3670368
07/15/98	14:16:27	6.91	0:05:27	-0.42	327.4	0.42	0.0	0.00	-0.3743789
07/15/98	14:16:32	6.91	0:05:32	-0.42	332.4	0.42	0.0	0.00	-0.3782008
07/15/98	14:16:37	6.92	0:05:37	-0.41	337.4	0.41	0.0	0.00	-0.3895528
07/15/98	14:16:42	6.93	0:05:42	-0.40	342.4	0.40	0.0	0.00	-0.3972891
07/15/98	14:16:47	6.94	0:05:47	-0.39	347.4	0.39	0.0	0.00	-0.4051656
07/15/98	14:16:52	6.94	0:05:52	-0.39	352.4	0.39	0.0	0.00	-0.4091582
07/15/98	14:16:57	6.95	0:05:57	-0.38	357.4	0.38	0.0	0.00	-0.4214754
07/15/98	14:17:02	6.96	0:06:02	-0.38	362.4	0.38	0.0	0.00	-0.4256214
07/15/98	14:17:07	6.96	0:06:07	-0.37	367.4	0.37	0.0	0.00	-0.4298074
07/15/98	14:17:12	6.97	0:06:12	-0.36	372.4	0.36	0.0	0.00	-0.4383025
07/15/98	14:17:17	6.97	0:06:17	-0.36	377.4	0.36	0.0	0.00	-0.446967
07/15/98	14:17:22	6.98	0:06:22	-0.35	382.5	0.35	0.0	0.00	-0.4513649
07/15/98	14:17:52	7.01	0:06:52	-0.32	412.4	0.32	0.0	0.00	-0.4932245
07/15/98	14:18:22	7.04	0:07:22	-0.29	442.4	0.29	0.0	0.00	-0.5395532
07/15/98	14:18:52	7.06	0:07:52	-0.27	472.4	0.27	0.0	0.00	-0.5733261
07/15/98	14:19:22	7.09	0:08:22	-0.24	502.4	0.24	0.0	0.00	-0.6165437
07/15/98	14:19:52	7.11	0:08:52	-0.22	532.4	0.22	0.0	0.00	-0.650334
07/15/98	14:20:22	7.13	0:09:22	-0.20	562.4	0.20	0.0	0.00	-0.6944337
07/15/98	14:20:52	7.14	0:09:52	-0.19	592.4	0.19	0.0	0.00	-0.7267672
07/15/98	14:21:22	7.15	0:10:22	-0.18	622.4	0.18	0.0	0.00	-0.7525177
07/15/98	14:21:52	7.16	0:10:52	-0.17	652.4	0.17	0.0	0.00	-0.7614521
07/15/98	14:22:22	7.17	0:11:22	-0.16	682.4	0.16	0.0	0.00	-0.789414
07/15/98	14:22:52	7.18	0:11:52	-0.15	712.4	0.15	0.0	0.00	-0.8300318
07/15/98	14:23:22	7.19	0:12:22	-0.14	742.4	0.14	0.0	0.00	-0.8407337
07/15/98	14:23:52	7.20	0:12:52	-0.13	772.4	0.13	0.0	0.00	-0.8745187
07/15/98	14:24:22	7.20	0:13:22	-0.13	802.4	0.13	0.0	0.00	-0.8863908
07/15/98	14:24:52	7.20	0:13:52	-0.13	832.4	0.13	0.0	0.00	-0.8745187
07/15/98	14:25:22	7.21	0:14:22	-0.12	862.4	0.12	0.0	0.00	-0.9111554
07/15/98	14:25:52	7.22	0:14:52	-0.11	892.4	0.11	0.0	0.00	-0.9515582
07/15/98	14:26:22	7.22	0:15:22	-0.11	922.4	0.11	0.0	0.00	-0.9515582
07/15/98	14:26:52	7.22	0:15:52	-0.11	952.4	0.11	0.0	0.00	-0.9657727
07/15/98	14:27:22	7.23	0:16:22	-0.10	982.4	0.10	0.0	0.00	-0.9804683
07/15/98	14:27:52	7.23	0:16:52	-0.10	1012.4	0.10	0.0	0.00	-0.9804683
07/15/98	14:28:22	7.23	0:17:22	-0.10	1042.4	0.10	0.0	0.00	-1.011441
07/15/98	14:28:52	7.23	0:17:52	-0.10	1072.4	0.10	0.0	0.00	-1.011441
07/15/98	14:29:22	7.23	0:18:22	-0.10	1102.4	0.10	0.0	0.00	-1.011441
07/15/98	14:29:52	7.24	0:18:52	-0.09	1132.4	0.09	0.0	0.00	-1.0277972
07/15/98	14:30:22	7.23	0:19:22	-0.10	1162.4	0.10	0.0	0.00	-1.011441
07/15/98	14:30:52	7.24	0:19:52	-0.09	1192.4	0.09	0.0	0.00	-1.0277972
07/15/98	14:31:22	7.24	0:20:22	-0.09	1222.4	0.09	0.0	0.00	-1.0277972
07/15/98	14:31:52	7.24	0:20:52	-0.09	1252.4	0.09	0.0	0.00	-1.0277972

 Terra8 Data File --> C:\TMP\946W11B

MW11 Slug Out

Date	Time	Analog#01 mw-11..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	14:32:22	7.24	0:21:22	-0.09	1282.4	0.09	0.0	0.00	-1.0447935
07/15/98	14:32:52	7.24	0:21:52	-0.09	1312.4	0.09	0.0	0.00	-1.0447935
07/15/98	14:33:22	7.24	0:22:22	-0.09	1342.4	0.09	0.0	0.00	-1.0277972
07/15/98	14:33:52	7.24	0:22:52	-0.09	1372.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:34:52	7.24	0:23:52	-0.09	1432.4	0.09	0.0	0.00	-1.0277972
07/15/98	14:35:22	7.24	0:24:22	-0.09	1462.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:35:52	7.24	0:24:52	-0.09	1492.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:36:22	7.24	0:25:22	-0.09	1522.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:36:52	7.24	0:25:52	-0.09	1552.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:37:22	7.24	0:26:22	-0.09	1582.4	0.09	0.0	0.00	-1.0447935
07/15/98	14:37:52	7.24	0:26:52	-0.09	1612.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:38:22	7.24	0:27:22	-0.09	1642.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:38:52	7.24	0:27:52	-0.09	1672.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:39:22	7.24	0:28:22	-0.09	1702.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:39:52	7.24	0:28:52	-0.09	1732.4	0.09	0.0	0.00	-1.0447935
07/15/98	14:40:22	7.24	0:29:22	-0.09	1762.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:40:52	7.25	0:29:52	-0.08	1792.4	0.08	0.0	0.00	-1.0809219
07/15/98	14:41:22	7.25	0:30:22	-0.08	1822.4	0.08	0.0	0.00	-1.0809219
07/15/98	14:41:52	7.24	0:30:52	-0.09	1852.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:42:22	7.24	0:31:22	-0.09	1882.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:42:52	7.25	0:31:52	-0.08	1912.4	0.08	0.0	0.00	-1.0809219
07/15/98	14:43:22	7.24	0:32:22	-0.09	1942.4	0.09	0.0	0.00	-1.0447935
07/15/98	14:43:52	7.24	0:32:52	-0.09	1972.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:44:22	7.24	0:33:22	-0.09	2002.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:44:52	7.24	0:33:52	-0.09	2032.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:45:22	7.24	0:34:22	-0.09	2062.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:45:52	7.24	0:34:52	-0.09	2092.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:46:22	7.24	0:35:22	-0.09	2122.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:46:52	7.24	0:35:52	-0.09	2152.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:47:22	7.25	0:36:22	-0.08	2182.5	0.08	0.0	0.00	-1.0809219
07/15/98	14:48:22	7.25	0:37:22	-0.08	2242.4	0.08	0.0	0.00	-1.0809219
07/15/98	14:49:22	7.24	0:38:22	-0.09	2302.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:50:22	7.25	0:39:22	-0.08	2362.4	0.08	0.0	0.00	-1.0809219
07/15/98	14:51:22	7.25	0:40:22	-0.08	2422.4	0.08	0.0	0.00	-1.0809219
07/15/98	14:52:22	7.25	0:41:22	-0.08	2482.4	0.08	0.0	0.00	-1.0809219
07/15/98	14:53:22	7.25	0:42:22	-0.08	2542.4	0.08	0.0	0.00	-1.0809219
07/15/98	14:54:22	7.24	0:43:22	-0.09	2602.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:55:22	7.25	0:44:22	-0.08	2662.4	0.08	0.0	0.00	-1.0809219
07/15/98	14:56:22	7.24	0:45:22	-0.09	2722.4	0.09	0.0	0.00	-1.0447935
07/15/98	14:57:22	7.24	0:46:22	-0.09	2782.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:58:22	7.24	0:47:22	-0.09	2842.4	0.09	0.0	0.00	-1.0624821
07/15/98	14:59:22	7.24	0:48:22	-0.09	2902.4	0.09	0.0	0.00	-1.0624821
07/15/98	15:00:22	7.24	0:49:22	-0.09	2962.4	0.09	0.0	0.00	-1.0624821

Vernon Co. MW-12 Slug In



08/26/2003

946W12a.xls MW12a graph

 Terra8 Data File --> C:\TMP\946W12X

MW12 Slug In

Date	Time	Analog#01 mw-12..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	15:13:22	7.10	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
07/15/98	15:13:23	7.78	0:00:00	0.68	0.5	0.68	0.0	0.00	-0.1683861
07/15/98	15:13:23	7.07	0:00:01	-0.03	0.9	0.03	0.0	0.00	-1.5985995
07/15/98	15:13:24	8.06	0:00:01	0.96	1.4	0.96	0.0	0.00	-0.0176835
07/15/98	15:13:24	7.98	0:00:02	0.88	1.8	0.88	0.0	0.00	-0.055172
07/15/98	15:13:25	8.22	0:00:02	1.12	2.3	1.12	0.0	0.00	0.04879127
07/15/98	15:13:25	6.95	0:00:03	-0.15	2.8	0.15	0.0	0.00	-0.8193008
07/15/98	15:13:25	7.88	0:00:03	0.78	3.2	0.78	0.0	0.00	-0.1060719
07/15/98	15:13:26	7.09	0:00:04	-0.01	3.7	0.01	0.0	0.00	-2.1426675
07/15/98	15:13:26	7.55	0:00:04	0.45	4.1	0.45	0.0	0.00	-0.3456309
07/15/98	15:13:27	7.35	0:00:05	0.25	4.6	0.25	0.0	0.00	-0.5973948
07/15/98	15:13:27	7.32	0:00:05	0.22	5.1	0.22	0.0	0.00	-0.6501399
07/15/98	15:13:28	7.31	0:00:06	0.21	5.5	0.21	0.0	0.00	-0.6790233
07/15/98	15:13:28	7.30	0:00:06	0.20	6.0	0.20	0.0	0.00	-0.6942188
07/15/98	15:13:29	7.30	0:00:06	0.20	6.5	0.20	0.0	0.00	-0.7020208
07/15/98	15:13:29	7.29	0:00:07	0.19	6.9	0.19	0.0	0.00	-0.718285
07/15/98	15:13:30	7.29	0:00:07	0.19	7.4	0.19	0.0	0.00	-0.718285
07/15/98	15:13:30	7.29	0:00:08	0.19	7.8	0.19	0.0	0.00	-0.7265357
07/15/98	15:13:30	7.28	0:00:08	0.18	8.3	0.18	0.0	0.00	-0.7349462
07/15/98	15:13:31	7.28	0:00:09	0.18	8.8	0.18	0.0	0.00	-0.7349462
07/15/98	15:13:31	7.28	0:00:09	0.18	9.2	0.18	0.0	0.00	-0.7435228
07/15/98	15:13:32	7.28	0:00:10	0.18	9.7	0.18	0.0	0.00	-0.7435228
07/15/98	15:13:32	7.28	0:00:10	0.18	10.1	0.18	0.0	0.00	-0.7522722
07/15/98	15:13:33	7.28	0:00:11	0.18	10.6	0.18	0.0	0.00	-0.7522722
07/15/98	15:13:33	7.28	0:00:11	0.18	11.1	0.18	0.0	0.00	-0.7522722
07/15/98	15:13:34	7.27	0:00:12	0.17	11.5	0.17	0.0	0.00	-0.7612014
07/15/98	15:13:34	7.28	0:00:12	0.18	12.0	0.18	0.0	0.00	-0.7522722
07/15/98	15:13:35	7.27	0:00:12	0.17	12.4	0.17	0.0	0.00	-0.7703182
07/15/98	15:13:35	7.27	0:00:13	0.17	12.9	0.17	0.0	0.00	-0.7703182
07/15/98	15:13:36	7.27	0:00:13	0.17	13.4	0.17	0.0	0.00	-0.7703182
07/15/98	15:13:36	7.27	0:00:14	0.17	13.8	0.17	0.0	0.00	-0.7703182
07/15/98	15:13:37	7.27	0:00:14	0.17	14.3	0.17	0.0	0.00	-0.7796304
07/15/98	15:13:37	7.27	0:00:15	0.17	14.8	0.17	0.0	0.00	-0.7796304
07/15/98	15:13:37	7.27	0:00:15	0.17	15.2	0.17	0.0	0.00	-0.7796304
07/15/98	15:13:38	7.27	0:00:16	0.17	15.7	0.17	0.0	0.00	-0.7796304
07/15/98	15:13:38	7.26	0:00:16	0.16	16.1	0.16	0.0	0.00	-0.7891466
07/15/98	15:13:39	7.26	0:00:17	0.16	16.6	0.16	0.0	0.00	-0.7891466
07/15/98	15:13:39	7.26	0:00:17	0.16	17.1	0.16	0.0	0.00	-0.7988761
07/15/98	15:13:40	7.26	0:00:18	0.16	17.5	0.16	0.0	0.00	-0.7988761
07/15/98	15:13:40	7.26	0:00:18	0.16	18.0	0.16	0.0	0.00	-0.7891466
07/15/98	15:13:41	7.25	0:00:18	0.16	18.4	0.16	0.0	0.00	-0.8091083
07/15/98	15:13:41	7.26	0:00:19	0.16	18.9	0.16	0.0	0.00	-0.7988761
07/15/98	15:13:42	7.25	0:00:19	0.16	19.4	0.16	0.0	0.00	-0.8091083
07/15/98	15:13:42	7.26	0:00:20	0.16	19.8	0.16	0.0	0.00	-0.7988761
07/15/98	15:13:42	7.26	0:00:20	0.16	20.3	0.16	0.0	0.00	-0.7988761
07/15/98	15:13:43	7.25	0:00:21	0.16	21.2	0.16	0.0	0.00	-0.8091083
07/15/98	15:13:44	7.25	0:00:22	0.16	21.7	0.16	0.0	0.00	-0.8091083
07/15/98	15:13:44	7.25	0:00:22	0.16	22.1	0.16	0.0	0.00	-0.8091083
07/15/98	15:13:45	7.25	0:00:23	0.15	22.6	0.15	0.0	0.00	-0.8193008

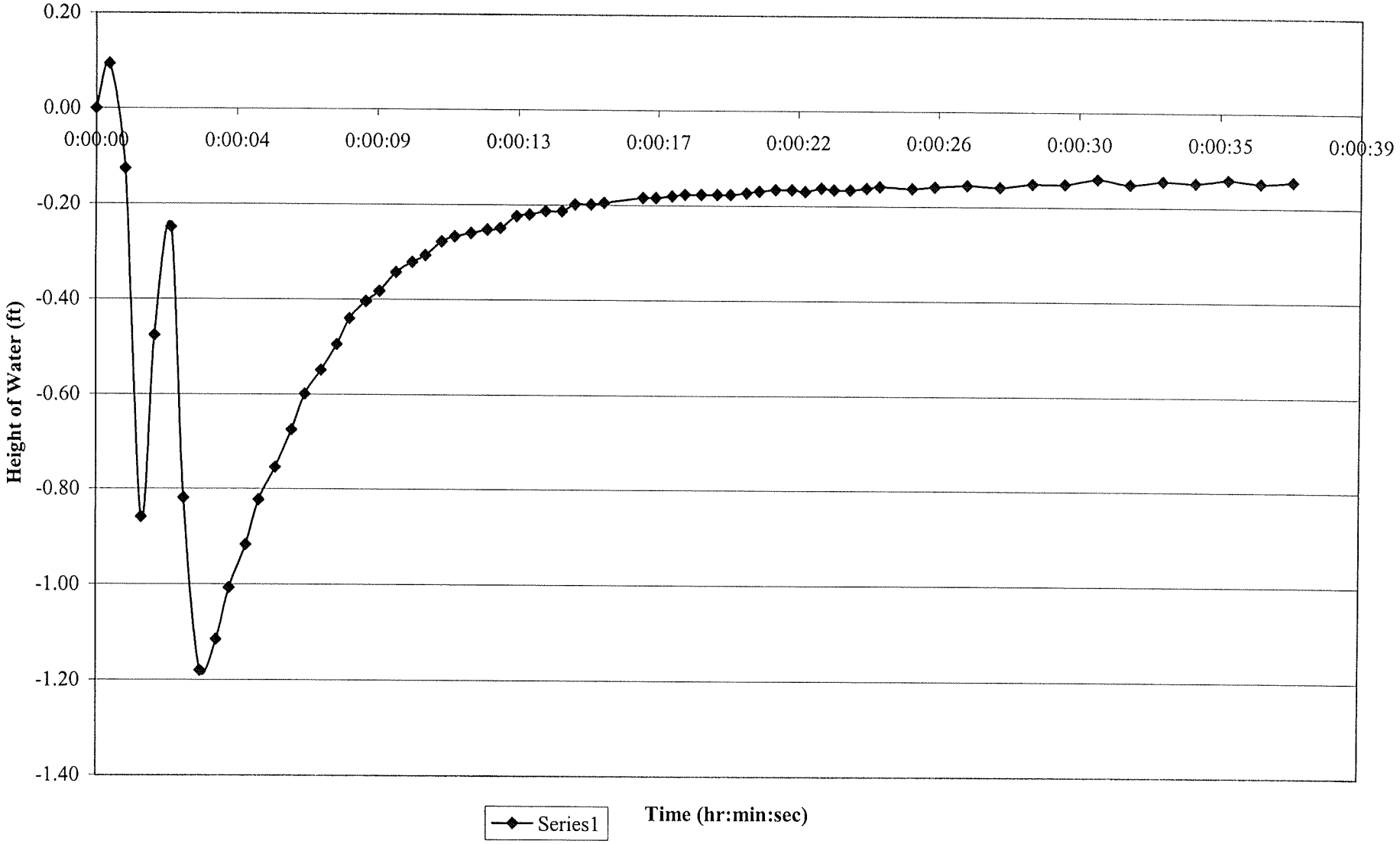
 Terra8 Data File --> C:\TMP\946W12X

Date	Time	MW12 Slug In Analog#01 mw-12..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	15:13:45	7.25	0:00:23	0.15	23.0	0.15	0.0	0.00	-0.8297383
07/15/98	15:13:46	7.25	0:00:23	0.15	23.5	0.15	0.0	0.00	-0.8193008
07/15/98	15:13:46	7.25	0:00:24	0.15	24.0	0.15	0.0	0.00	-0.8193008
07/15/98	15:13:47	7.25	0:00:25	0.16	24.5	0.16	0.0	0.00	-0.8091083
07/15/98	15:13:48	7.25	0:00:26	0.15	26.1	0.15	0.0	0.00	-0.8193008
07/15/98	15:13:49	7.25	0:00:27	0.15	27.1	0.15	0.0	0.00	-0.8297383
07/15/98	15:13:50	7.25	0:00:28	0.15	28.1	0.15	0.0	0.00	-0.8297383
07/15/98	15:13:51	7.25	0:00:29	0.15	29.1	0.15	0.0	0.00	-0.8193008
07/15/98	15:13:52	7.25	0:00:30	0.15	30.1	0.15	0.0	0.00	-0.8193008
07/15/98	15:13:53	7.24	0:00:31	0.14	31.1	0.14	0.0	0.00	-0.8404328
07/15/98	15:13:54	7.24	0:00:32	0.14	32.1	0.14	0.0	0.00	-0.8404328
07/15/98	15:13:55	7.24	0:00:33	0.14	33.1	0.14	0.0	0.00	-0.8404328
07/15/98	15:13:56	7.24	0:00:34	0.14	34.1	0.14	0.0	0.00	-0.8404328
07/15/98	15:13:57	7.24	0:00:35	0.14	35.1	0.14	0.0	0.00	-0.8404328
07/15/98	15:13:58	7.24	0:00:36	0.14	36.1	0.14	0.0	0.00	-0.8513973
07/15/98	15:14:00	7.24	0:00:37	0.14	37.4	0.14	0.0	0.00	-0.8626459
07/15/98	15:14:00	7.24	0:00:38	0.14	38.1	0.14	0.0	0.00	-0.8513973
07/15/98	15:14:01	7.24	0:00:39	0.14	39.1	0.14	0.0	0.00	-0.8513973
07/15/98	15:14:02	7.24	0:00:40	0.14	40.1	0.14	0.0	0.00	-0.8626459
07/15/98	15:14:03	7.24	0:00:41	0.14	41.1	0.14	0.0	0.00	-0.8626459
07/15/98	15:14:04	7.23	0:00:42	0.13	42.1	0.13	0.0	0.00	-0.8741935
07/15/98	15:14:05	7.23	0:00:43	0.13	43.1	0.13	0.0	0.00	-0.8982529
07/15/98	15:14:06	7.24	0:00:44	0.14	44.1	0.14	0.0	0.00	-0.8513973
07/15/98	15:14:07	7.23	0:00:45	0.13	45.1	0.13	0.0	0.00	-0.8860566
07/15/98	15:14:08	7.23	0:00:46	0.13	46.1	0.13	0.0	0.00	-0.8741935
07/15/98	15:14:09	7.24	0:00:47	0.14	47.1	0.14	0.0	0.00	-0.8626459
07/15/98	15:14:10	7.24	0:00:48	0.14	48.1	0.14	0.0	0.00	-0.8626459
07/15/98	15:14:11	7.23	0:00:49	0.13	49.1	0.13	0.0	0.00	-0.8741935
07/15/98	15:14:12	7.23	0:00:50	0.13	50.1	0.13	0.0	0.00	-0.8741935
07/15/98	15:14:13	7.23	0:00:51	0.13	51.1	0.13	0.0	0.00	-0.8860566
07/15/98	15:14:14	7.23	0:00:52	0.13	52.1	0.13	0.0	0.00	-0.8860566
07/15/98	15:14:15	7.23	0:00:53	0.13	53.1	0.13	0.0	0.00	-0.8860566
07/15/98	15:14:16	7.23	0:00:54	0.13	54.1	0.13	0.0	0.00	-0.8860566
07/15/98	15:14:17	7.23	0:00:55	0.13	55.1	0.13	0.0	0.00	-0.8860566
07/15/98	15:14:18	7.23	0:00:56	0.13	56.1	0.13	0.0	0.00	-0.8982529
07/15/98	15:14:19	7.23	0:00:57	0.13	57.1	0.13	0.0	0.00	-0.8860566
07/15/98	15:14:20	7.23	0:00:58	0.13	58.1	0.13	0.0	0.00	-0.8860566
07/15/98	15:14:21	7.23	0:00:59	0.13	59.1	0.13	0.0	0.00	-0.8860566
07/15/98	15:14:22	7.22	0:01:00	0.12	60.1	0.12	0.0	0.00	-0.9108016
07/15/98	15:14:23	7.23	0:01:01	0.13	61.1	0.13	0.0	0.00	-0.8982529
07/15/98	15:14:24	7.23	0:01:02	0.13	62.1	0.13	0.0	0.00	-0.8982529
07/15/98	15:14:25	7.22	0:01:03	0.12	63.1	0.12	0.0	0.00	-0.9108016
07/15/98	15:14:26	7.22	0:01:04	0.12	64.1	0.12	0.0	0.00	-0.9108016
07/15/98	15:14:27	7.22	0:01:05	0.12	65.1	0.12	0.0	0.00	-0.9108016
07/15/98	15:14:28	7.22	0:01:06	0.12	66.1	0.12	0.0	0.00	-0.9108016
07/15/98	15:14:29	7.23	0:01:07	0.13	67.1	0.13	0.0	0.00	-0.8982529
07/15/98	15:14:30	7.22	0:01:08	0.12	68.1	0.12	0.0	0.00	-0.9108016
07/15/98	15:14:31	7.22	0:01:09	0.12	69.1	0.12	0.0	0.00	-0.9108016
07/15/98	15:14:32	7.23	0:01:10	0.13	70.1	0.13	0.0	0.00	-0.8982529

 Terra8 Data File --> C:\TMP\946W12X

Date	Time	MW12 Slug In Analog#01 mw-12..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	15:14:34	7.23	0:01:12	0.13	72.1	0.13	0.0	0.00	-0.8982529
07/15/98	15:14:35	7.22	0:01:13	0.12	73.1	0.12	0.0	0.00	-0.937418
07/15/98	15:14:36	7.22	0:01:14	0.12	74.1	0.12	0.0	0.00	-0.9108016
07/15/98	15:14:37	7.22	0:01:15	0.12	75.1	0.12	0.0	0.00	-0.9108016
07/15/98	15:14:38	7.23	0:01:16	0.13	76.1	0.13	0.0	0.00	-0.8982529
07/15/98	15:14:39	7.22	0:01:17	0.12	77.1	0.12	0.0	0.00	-0.937418
07/15/98	15:14:40	7.23	0:01:18	0.13	78.1	0.13	0.0	0.00	-0.8982529
07/15/98	15:14:41	7.22	0:01:19	0.12	79.1	0.12	0.0	0.00	-0.937418
07/15/98	15:14:42	7.22	0:01:20	0.12	80.1	0.12	0.0	0.00	-0.937418
07/15/98	15:14:43	7.22	0:01:21	0.12	81.1	0.12	0.0	0.00	-0.937418
07/15/98	15:14:45	7.22	0:01:22	0.12	82.4	0.12	0.0	0.00	-0.9237237
07/15/98	15:14:45	7.22	0:01:23	0.12	83.1	0.12	0.0	0.00	-0.937418
07/15/98	15:14:46	7.22	0:01:24	0.12	84.1	0.12	0.0	0.00	-0.937418
07/15/98	15:14:47	7.21	0:01:25	0.11	85.2	0.11	0.0	0.00	-0.9511699
07/15/98	15:14:52	7.22	0:01:30	0.12	90.1	0.12	0.0	0.00	-0.9237237
07/15/98	15:14:57	7.21	0:01:35	0.11	95.1	0.11	0.0	0.00	-0.9511699
07/15/98	15:15:02	7.22	0:01:40	0.12	100.1	0.12	0.0	0.00	-0.937418
07/15/98	15:15:07	7.21	0:01:45	0.11	105.1	0.11	0.0	0.00	-0.9653715
07/15/98	15:15:12	7.21	0:01:50	0.11	110.1	0.11	0.0	0.00	-0.9511699
07/15/98	15:15:17	7.21	0:01:55	0.11	115.1	0.11	0.0	0.00	-0.9653715
07/15/98	15:15:22	7.20	0:02:00	0.10	120.1	0.10	0.0	0.00	-0.9800533
07/15/98	15:15:27	7.20	0:02:05	0.10	125.1	0.10	0.0	0.00	-0.9800533
07/15/98	15:15:32	7.20	0:02:10	0.10	130.1	0.10	0.0	0.00	-0.9800533
07/15/98	15:15:37	7.20	0:02:15	0.10	135.1	0.10	0.0	0.00	-0.9800533
07/15/98	15:15:42	7.20	0:02:20	0.10	140.1	0.10	0.0	0.00	-0.9952488
07/15/98	15:15:47	7.20	0:02:25	0.10	145.1	0.10	0.0	0.00	-1.0109954
07/15/98	15:15:52	7.20	0:02:30	0.10	150.1	0.10	0.0	0.00	-1.0109954
07/15/98	15:15:57	7.20	0:02:35	0.10	155.1	0.10	0.0	0.00	-1.0109954
07/15/98	15:16:02	7.19	0:02:40	0.09	160.1	0.09	0.0	0.00	-1.0443122
07/15/98	15:16:07	7.20	0:02:45	0.10	165.1	0.10	0.0	0.00	-1.0109954
07/15/98	15:16:12	7.19	0:02:50	0.09	170.1	0.09	0.0	0.00	-1.0273344
07/15/98	15:16:17	7.19	0:02:55	0.09	175.1	0.09	0.0	0.00	-1.0273344
07/15/98	15:16:22	7.19	0:03:00	0.09	180.1	0.09	0.0	0.00	-1.0273344
07/15/98	15:16:27	7.19	0:03:05	0.09	185.1	0.09	0.0	0.00	-1.0273344
07/15/98	15:16:32	7.19	0:03:10	0.09	190.1	0.09	0.0	0.00	-1.0443122
07/15/98	15:16:37	7.19	0:03:15	0.09	195.1	0.09	0.0	0.00	-1.0443122
07/15/98	15:16:42	7.19	0:03:20	0.09	200.1	0.09	0.0	0.00	-1.0443122
07/15/98	15:16:47	7.19	0:03:25	0.09	205.1	0.09	0.0	0.00	-1.0443122
07/15/98	15:16:52	7.19	0:03:30	0.09	210.1	0.09	0.0	0.00	-1.0273344
07/15/98	15:16:57	7.18	0:03:35	0.08	215.1	0.08	0.0	0.00	-1.080399
07/15/98	15:17:02	7.19	0:03:40	0.09	220.1	0.09	0.0	0.00	-1.0619809
07/15/98	15:17:07	7.18	0:03:45	0.08	225.1	0.08	0.0	0.00	-1.080399
07/15/98	15:17:12	7.18	0:03:50	0.08	230.1	0.08	0.0	0.00	-1.080399
07/15/98	15:17:17	7.18	0:03:55	0.08	235.1	0.08	0.0	0.00	-1.1001795
07/15/98	15:17:22	7.18	0:04:00	0.08	240.1	0.08	0.0	0.00	-1.080399
07/15/98	15:17:27	7.19	0:04:05	0.09	245.1	0.09	0.0	0.00	-1.0619809
07/15/98	15:17:32	7.18	0:04:10	0.08	250.1	0.08	0.0	0.00	-1.1001795
07/15/98	15:17:37	7.18	0:04:15	0.08	255.1	0.08	0.0	0.00	-1.080399

Vernon Co. MW-12 Slug Out



 Terra8 Data File --> C:\TMP\946W12X

MW12 Slug Out

Date	Time	Analog#01 mw-12..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	15:19:17	7.17	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
07/15/98	15:19:18	7.27	0:00:00	0.09	0.4	0.09	0.0	0.00	-1.0273344
07/15/98	15:19:18	7.05	0:00:01	-0.13	0.9	0.13	0.0	0.00	-0.8985966
07/15/98	15:19:19	6.31	0:00:01	-0.86	1.4	0.86	0.0	0.00	-0.0660068
07/15/98	15:19:19	6.70	0:00:02	-0.48	1.8	0.48	0.0	0.00	-0.3220282
07/15/98	15:19:20	6.92	0:00:02	-0.25	2.3	0.25	0.0	0.00	-0.6038007
07/15/98	15:19:20	6.35	0:00:03	-0.82	2.7	0.82	0.0	0.00	-0.086557
07/15/98	15:19:21	5.99	0:00:03	-1.18	3.2	1.18	0.0	0.00	0.07195561
07/15/98	15:19:21	6.06	0:00:04	-1.12	3.7	1.12	0.0	0.00	0.0473917
07/15/98	15:19:22	6.16	0:00:04	-1.01	4.1	1.01	0.0	0.00	0.00302947
07/15/98	15:19:22	6.26	0:00:05	-0.92	4.6	0.92	0.0	0.00	-0.0377254
07/15/98	15:19:22	6.35	0:00:05	-0.82	5.0	0.82	0.0	0.00	-0.0846529
07/15/98	15:19:23	6.42	0:00:06	-0.75	5.5	0.75	0.0	0.00	-0.1224559
07/15/98	15:19:24	6.50	0:00:06	-0.67	6.0	0.67	0.0	0.00	-0.1707606
07/15/98	15:19:24	6.57	0:00:06	-0.60	6.4	0.60	0.0	0.00	-0.2225007
07/15/98	15:19:24	6.62	0:00:07	-0.55	6.9	0.55	0.0	0.00	-0.2607442
07/15/98	15:19:25	6.68	0:00:07	-0.49	7.4	0.49	0.0	0.00	-0.3058337
07/15/98	15:19:25	6.73	0:00:08	-0.44	7.8	0.44	0.0	0.00	-0.3562513
07/15/98	15:19:26	6.77	0:00:08	-0.40	8.3	0.40	0.0	0.00	-0.3934037
07/15/98	15:19:26	6.79	0:00:09	-0.38	8.7	0.38	0.0	0.00	-0.417255
07/15/98	15:19:27	6.83	0:00:09	-0.34	9.2	0.34	0.0	0.00	-0.4648325
07/15/98	15:19:27	6.85	0:00:10	-0.32	9.7	0.32	0.0	0.00	-0.4932245
07/15/98	15:19:28	6.87	0:00:10	-0.31	10.1	0.31	0.0	0.00	-0.5131446
07/15/98	15:19:28	6.89	0:00:11	-0.28	10.6	0.28	0.0	0.00	-0.5561115
07/15/98	15:19:28	6.90	0:00:11	-0.27	11.0	0.27	0.0	0.00	-0.5733261
07/15/98	15:19:29	6.91	0:00:12	-0.26	11.5	0.26	0.0	0.00	-0.5853609
07/15/98	15:19:29	6.92	0:00:12	-0.25	12.0	0.25	0.0	0.00	-0.5975667
07/15/98	15:19:30	6.92	0:00:12	-0.25	12.4	0.25	0.0	0.00	-0.6038007
07/15/98	15:19:30	6.95	0:00:13	-0.22	12.9	0.22	0.0	0.00	-0.6501399
07/15/98	15:19:31	6.95	0:00:13	-0.22	13.3	0.22	0.0	0.00	-0.65738
07/15/98	15:19:31	6.96	0:00:14	-0.21	13.8	0.21	0.0	0.00	-0.6718243
07/15/98	15:19:32	6.96	0:00:14	-0.21	14.3	0.21	0.0	0.00	-0.6718243
07/15/98	15:19:32	6.97	0:00:15	-0.20	14.7	0.20	0.0	0.00	-0.7022395
07/15/98	15:19:33	6.97	0:00:15	-0.20	15.2	0.20	0.0	0.00	-0.7022395
07/15/98	15:19:33	6.98	0:00:16	-0.19	15.6	0.19	0.0	0.00	-0.7101882
07/15/98	15:19:34	6.99	0:00:17	-0.18	16.8	0.18	0.0	0.00	-0.7351822
07/15/98	15:19:35	6.99	0:00:17	-0.18	17.2	0.18	0.0	0.00	-0.7351822
07/15/98	15:19:35	6.99	0:00:18	-0.18	17.7	0.18	0.0	0.00	-0.7437635
07/15/98	15:19:36	7.00	0:00:18	-0.18	18.1	0.18	0.0	0.00	-0.7525177
07/15/98	15:19:36	7.00	0:00:19	-0.18	18.6	0.18	0.0	0.00	-0.7525177
07/15/98	15:19:37	7.00	0:00:19	-0.18	19.1	0.18	0.0	0.00	-0.7525177
07/15/98	15:19:37	7.00	0:00:19	-0.18	19.5	0.18	0.0	0.00	-0.7525177
07/15/98	15:19:37	7.00	0:00:20	-0.17	20.0	0.17	0.0	0.00	-0.7614521
07/15/98	15:19:38	7.00	0:00:20	-0.17	20.4	0.17	0.0	0.00	-0.7705742
07/15/98	15:19:38	7.01	0:00:21	-0.17	20.9	0.17	0.0	0.00	-0.7798919
07/15/98	15:19:39	7.01	0:00:21	-0.17	21.4	0.17	0.0	0.00	-0.7798919
07/15/98	15:19:39	7.00	0:00:22	-0.17	21.8	0.17	0.0	0.00	-0.7705742
07/15/98	15:19:40	7.01	0:00:22	-0.16	22.3	0.16	0.0	0.00	-0.789414
07/15/98	15:19:40	7.01	0:00:23	-0.17	22.7	0.17	0.0	0.00	-0.7798919

 Terra8 Data File --> C:\TMP\946W12X

MW12 Slug Out

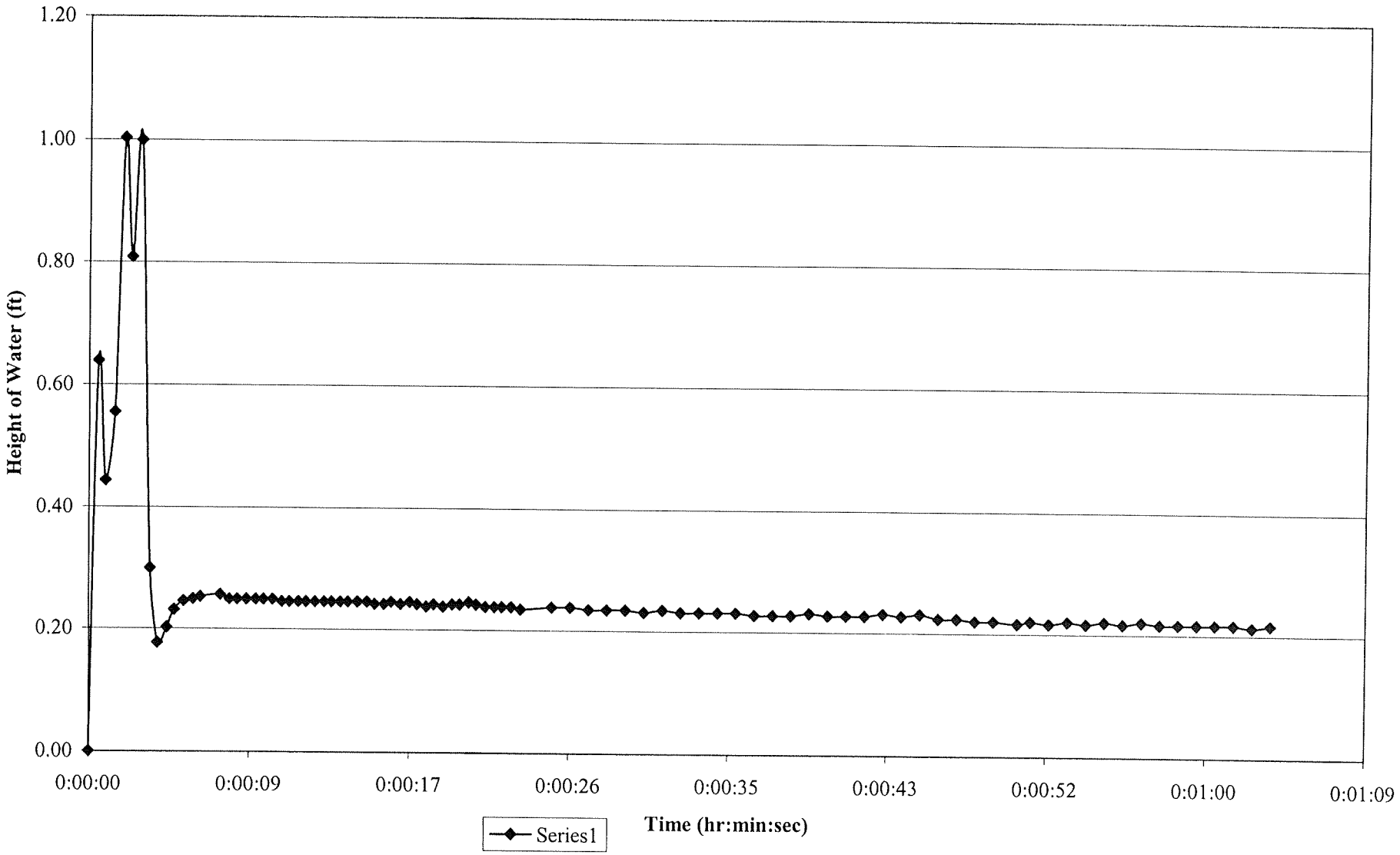
Date	Time	Analog#01 mw-12..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	15:19:41	7.01	0:00:23	-0.17	23.2	0.17	0.0	0.00	-0.7798919
07/15/98	15:19:41	7.01	0:00:24	-0.16	23.7	0.16	0.0	0.00	-0.789414
07/15/98	15:19:42	7.01	0:00:24	-0.16	24.1	0.16	0.0	0.00	-0.7991495
07/15/98	15:19:43	7.01	0:00:25	-0.16	25.1	0.16	0.0	0.00	-0.789414
07/15/98	15:19:43	7.01	0:00:26	-0.16	25.8	0.16	0.0	0.00	-0.7991495
07/15/98	15:19:44	7.02	0:00:27	-0.16	26.8	0.16	0.0	0.00	-0.8091083
07/15/98	15:19:45	7.01	0:00:28	-0.16	27.8	0.16	0.0	0.00	-0.7991495
07/15/98	15:19:46	7.02	0:00:29	-0.15	28.8	0.15	0.0	0.00	-0.8193008
07/15/98	15:19:47	7.02	0:00:30	-0.15	29.8	0.15	0.0	0.00	-0.8193008
07/15/98	15:19:48	7.03	0:00:31	-0.14	30.8	0.14	0.0	0.00	-0.8517059
07/15/98	15:19:49	7.02	0:00:32	-0.15	31.8	0.15	0.0	0.00	-0.8193008
07/15/98	15:19:50	7.03	0:00:33	-0.14	32.8	0.14	0.0	0.00	-0.8407337
07/15/98	15:19:51	7.02	0:00:34	-0.15	33.8	0.15	0.0	0.00	-0.8297383
07/15/98	15:19:52	7.03	0:00:35	-0.14	34.8	0.14	0.0	0.00	-0.8517059
07/15/98	15:19:53	7.02	0:00:36	-0.15	35.8	0.15	0.0	0.00	-0.8297383
07/15/98	15:19:54	7.03	0:00:37	-0.14	36.8	0.14	0.0	0.00	-0.8407337
07/15/98	15:19:55	7.03	0:00:38	-0.14	37.8	0.14	0.0	0.00	-0.8407337
07/15/98	15:19:56	7.03	0:00:39	-0.14	38.8	0.14	0.0	0.00	-0.8407337
07/15/98	15:19:57	7.03	0:00:40	-0.14	39.8	0.14	0.0	0.00	-0.8407337
07/15/98	15:19:58	7.03	0:00:41	-0.14	40.8	0.14	0.0	0.00	-0.8407337
07/15/98	15:19:59	7.03	0:00:42	-0.14	41.8	0.14	0.0	0.00	-0.8517059
07/15/98	15:20:00	7.03	0:00:43	-0.14	42.8	0.14	0.0	0.00	-0.8407337
07/15/98	15:20:01	7.03	0:00:44	-0.14	43.8	0.14	0.0	0.00	-0.8629625
07/15/98	15:20:02	7.03	0:00:45	-0.14	44.8	0.14	0.0	0.00	-0.8629625
07/15/98	15:20:03	7.03	0:00:46	-0.14	45.8	0.14	0.0	0.00	-0.8629625
07/15/98	15:20:04	7.03	0:00:47	-0.14	46.8	0.14	0.0	0.00	-0.8629625
07/15/98	15:20:05	7.03	0:00:48	-0.14	47.8	0.14	0.0	0.00	-0.8629625
07/15/98	15:20:06	7.02	0:00:49	-0.15	48.8	0.15	0.0	0.00	-0.8297383
07/15/98	15:20:07	7.03	0:00:50	-0.14	49.8	0.14	0.0	0.00	-0.8407337
07/15/98	15:20:08	7.04	0:00:51	-0.13	50.8	0.13	0.0	0.00	-0.8745187
07/15/98	15:20:09	7.04	0:00:52	-0.13	51.8	0.13	0.0	0.00	-0.8745187
07/15/98	15:20:10	7.05	0:00:53	-0.13	52.8	0.13	0.0	0.00	-0.8985966
07/15/98	15:20:11	7.05	0:00:54	-0.13	53.8	0.13	0.0	0.00	-0.8985966
07/15/98	15:20:12	7.04	0:00:55	-0.13	54.8	0.13	0.0	0.00	-0.8863908
07/15/98	15:20:13	7.05	0:00:56	-0.13	55.8	0.13	0.0	0.00	-0.8985966
07/15/98	15:20:14	7.05	0:00:57	-0.12	56.8	0.12	0.0	0.00	-0.9111554
07/15/98	15:20:15	7.05	0:00:58	-0.13	57.8	0.13	0.0	0.00	-0.8985966
07/15/98	15:20:16	7.05	0:00:59	-0.12	58.8	0.12	0.0	0.00	-0.9111554
07/15/98	15:20:17	7.05	0:01:00	-0.12	59.8	0.12	0.0	0.00	-0.9111554
07/15/98	15:20:19	7.05	0:01:01	-0.12	61.1	0.12	0.0	0.00	-0.9111554
07/15/98	15:20:19	7.05	0:01:02	-0.12	61.8	0.12	0.0	0.00	-0.9111554
07/15/98	15:20:20	7.04	0:01:03	-0.13	62.8	0.13	0.0	0.00	-0.8863908
07/15/98	15:20:21	7.05	0:01:04	-0.12	63.8	0.12	0.0	0.00	-0.9240882
07/15/98	15:20:22	7.05	0:01:05	-0.12	64.8	0.12	0.0	0.00	-0.9240882
07/15/98	15:20:23	7.05	0:01:06	-0.12	65.8	0.12	0.0	0.00	-0.9240882
07/15/98	15:20:24	7.05	0:01:07	-0.12	66.8	0.12	0.0	0.00	-0.9240882
07/15/98	15:20:25	7.05	0:01:08	-0.13	67.8	0.13	0.0	0.00	-0.8985966
07/15/98	15:20:26	7.05	0:01:09	-0.12	68.8	0.12	0.0	0.00	-0.9111554
07/15/98	15:20:27	7.05	0:01:10	-0.12	69.8	0.12	0.0	0.00	-0.9111554

 Terra8 Data File --> C:\TMP\946W12X

MW12 Slug Out

Date	Time	Analog#01 mw-12..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	15:20:28	7.08	0:01:11	-0.09	70.8	0.09	0.0	0.00	-1.0277972
07/15/98	15:20:29	7.05	0:01:12	-0.12	71.8	0.12	0.0	0.00	-0.9111554
07/15/98	15:20:30	7.05	0:01:13	-0.12	72.8	0.12	0.0	0.00	-0.9240882
07/15/98	15:20:31	7.05	0:01:14	-0.12	73.8	0.12	0.0	0.00	-0.9240882
07/15/98	15:20:32	7.05	0:01:15	-0.12	74.8	0.12	0.0	0.00	-0.9240882
07/15/98	15:20:33	7.05	0:01:16	-0.12	75.8	0.12	0.0	0.00	-0.9240882
07/15/98	15:20:34	7.05	0:01:17	-0.12	76.8	0.12	0.0	0.00	-0.9240882
07/15/98	15:20:36	7.06	0:01:19	-0.12	78.8	0.12	0.0	0.00	-0.937418
07/15/98	15:20:37	7.06	0:01:20	-0.11	79.8	0.11	0.0	0.00	-0.9511699
07/15/98	15:20:38	7.06	0:01:21	-0.12	80.8	0.12	0.0	0.00	-0.937418
07/15/98	15:20:39	7.06	0:01:22	-0.12	81.8	0.12	0.0	0.00	-0.937418
07/15/98	15:20:40	7.06	0:01:23	-0.12	82.8	0.12	0.0	0.00	-0.937418
07/15/98	15:20:41	7.06	0:01:24	-0.12	83.8	0.12	0.0	0.00	-0.937418
07/15/98	15:20:42	7.06	0:01:25	-0.11	84.9	0.11	0.0	0.00	-0.9511699
07/15/98	15:20:47	7.06	0:01:30	-0.11	89.8	0.11	0.0	0.00	-0.9511699
07/15/98	15:20:52	7.06	0:01:35	-0.11	94.8	0.11	0.0	0.00	-0.9511699
07/15/98	15:20:57	7.06	0:01:40	-0.11	99.8	0.11	0.0	0.00	-0.9653715
07/15/98	15:21:02	7.07	0:01:45	-0.10	104.8	0.10	0.0	0.00	-0.9804683
07/15/98	15:21:07	7.07	0:01:50	-0.10	109.8	0.10	0.0	0.00	-0.9956786
07/15/98	15:21:12	7.07	0:01:55	-0.10	114.8	0.10	0.0	0.00	-0.9804683
07/15/98	15:21:17	7.07	0:02:00	-0.10	119.8	0.10	0.0	0.00	-0.9956786
07/15/98	15:21:22	7.06	0:02:05	-0.11	124.8	0.11	0.0	0.00	-0.9653715
07/15/98	15:21:27	7.07	0:02:10	-0.10	129.8	0.10	0.0	0.00	-0.9804683
07/15/98	15:21:32	7.07	0:02:15	-0.10	134.8	0.10	0.0	0.00	-1.011441
07/15/98	15:21:37	7.07	0:02:20	-0.10	139.8	0.10	0.0	0.00	-0.9956786
07/15/98	15:21:42	7.07	0:02:25	-0.10	144.8	0.10	0.0	0.00	-0.9804683
07/15/98	15:21:47	7.07	0:02:30	-0.10	149.8	0.10	0.0	0.00	-0.9956786
07/15/98	15:21:52	7.07	0:02:35	-0.10	154.8	0.10	0.0	0.00	-0.9956786
07/15/98	15:21:57	7.07	0:02:40	-0.10	159.8	0.10	0.0	0.00	-0.9956786
07/15/98	15:22:02	7.07	0:02:45	-0.10	164.8	0.10	0.0	0.00	-1.011441
07/15/98	15:22:07	7.07	0:02:50	-0.10	169.8	0.10	0.0	0.00	-1.011441
07/15/98	15:22:12	7.07	0:02:55	-0.10	174.8	0.10	0.0	0.00	-0.9956786
07/15/98	15:22:17	7.07	0:03:00	-0.10	179.8	0.10	0.0	0.00	-1.011441
07/15/98	15:22:22	7.07	0:03:05	-0.10	184.8	0.10	0.0	0.00	-1.011441
07/15/98	15:22:27	7.07	0:03:10	-0.10	189.8	0.10	0.0	0.00	-1.011441
07/15/98	15:22:32	7.07	0:03:15	-0.10	194.8	0.10	0.0	0.00	-1.011441
07/15/98	15:22:37	7.07	0:03:20	-0.10	199.8	0.10	0.0	0.00	-1.011441
07/15/98	15:22:42	7.07	0:03:25	-0.10	204.8	0.10	0.0	0.00	-1.011441

Vernon Co. MW-13P Slug In



08/25/2003

946W13PA.xls MW13Pa graph

Date	Time	MW13P Slug In Analog#01 mw13p ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	12:42:26	6.72E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
07/15/98	12:42:27	7.36E+00	0:00:01	0.64	0.5	0.64	0.0	0.00	-0.194635093
07/15/98	12:42:27	7.16E+00	0:00:01	0.44	0.9	0.44	0.0	0.00	-0.352714855
07/15/98	12:42:28	7.28E+00	0:00:01	0.56	1.4	0.56	0.0	0.00	-0.255081458
07/15/98	12:42:28	7.72E+00	0:00:02	1.00	1.9	1.00	0.0	0.00	0.001474097
07/15/98	12:42:29	7.53E+00	0:00:02	0.81	2.3	0.81	0.0	0.00	-0.092319976
07/15/98	12:42:29	7.72E+00	0:00:03	1.00	2.8	1.00	0.0	0.00	-8.68676E-05
07/15/98	12:42:30	7.02E+00	0:00:03	0.30	3.3	0.30	0.0	0.00	-0.523603173
07/15/98	12:42:30	6.90E+00	0:00:04	0.18	3.7	0.18	0.0	0.00	-0.752517739
07/15/98	12:42:30	6.92E+00	0:00:04	0.20	4.2	0.20	0.0	0.00	-0.694433686
07/15/98	12:42:31	6.95E+00	0:00:05	0.23	4.6	0.23	0.0	0.00	-0.63638802
07/15/98	12:42:31	6.97E+00	0:00:05	0.25	5.1	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:32	6.97E+00	0:00:06	0.25	5.6	0.25	0.0	0.00	-0.603800653
07/15/98	12:42:32	6.97E+00	0:00:06	0.25	6.0	0.25	0.0	0.00	-0.597566654
07/15/98	12:42:33	6.98E+00	0:00:07	0.26	7.1	0.26	0.0	0.00	-0.591420875
07/15/98	12:42:34	6.97E+00	0:00:08	0.25	7.6	0.25	0.0	0.00	-0.603800653
07/15/98	12:42:34	6.97E+00	0:00:08	0.25	8.0	0.25	0.0	0.00	-0.603800653
07/15/98	12:42:35	6.97E+00	0:00:09	0.25	8.5	0.25	0.0	0.00	-0.603800653
07/15/98	12:42:35	6.97E+00	0:00:09	0.25	9.0	0.25	0.0	0.00	-0.603800653
07/15/98	12:42:36	6.97E+00	0:00:09	0.25	9.4	0.25	0.0	0.00	-0.603800653
07/15/98	12:42:36	6.97E+00	0:00:10	0.25	9.9	0.25	0.0	0.00	-0.603800653
07/15/98	12:42:37	6.97E+00	0:00:10	0.25	10.4	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:37	6.97E+00	0:00:11	0.25	10.8	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:38	6.97E+00	0:00:11	0.25	11.3	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:38	6.97E+00	0:00:12	0.25	11.7	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:39	6.97E+00	0:00:12	0.25	12.2	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:39	6.97E+00	0:00:13	0.25	12.7	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:39	6.97E+00	0:00:13	0.25	13.1	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:40	6.97E+00	0:00:14	0.25	13.6	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:40	6.97E+00	0:00:14	0.25	14.0	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:41	6.97E+00	0:00:15	0.25	14.5	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:41	6.97E+00	0:00:15	0.25	15.0	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:42	6.96E+00	0:00:15	0.24	15.4	0.24	0.0	0.00	-0.616543703
07/15/98	12:42:42	6.96E+00	0:00:16	0.24	15.9	0.24	0.0	0.00	-0.616543703
07/15/98	12:42:43	6.97E+00	0:00:16	0.25	16.3	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:43	6.96E+00	0:00:17	0.24	16.8	0.24	0.0	0.00	-0.616543703
07/15/98	12:42:44	6.97E+00	0:00:17	0.25	17.3	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:44	6.96E+00	0:00:18	0.24	17.7	0.24	0.0	0.00	-0.616543703
07/15/98	12:42:44	6.96E+00	0:00:18	0.24	18.2	0.24	0.0	0.00	-0.623058243
07/15/98	12:42:45	6.96E+00	0:00:19	0.24	18.6	0.24	0.0	0.00	-0.616543703
07/15/98	12:42:45	6.96E+00	0:00:19	0.24	19.1	0.24	0.0	0.00	-0.623058243
07/15/98	12:42:46	6.96E+00	0:00:20	0.24	19.6	0.24	0.0	0.00	-0.616543703
07/15/98	12:42:46	6.96E+00	0:00:20	0.24	20.0	0.24	0.0	0.00	-0.616543703
07/15/98	12:42:47	6.97E+00	0:00:21	0.25	20.5	0.25	0.0	0.00	-0.610125442
07/15/98	12:42:47	6.96E+00	0:00:21	0.24	20.9	0.24	0.0	0.00	-0.616543703
07/15/98	12:42:48	6.96E+00	0:00:21	0.24	21.4	0.24	0.0	0.00	-0.623058243
07/15/98	12:42:48	6.96E+00	0:00:22	0.24	21.9	0.24	0.0	0.00	-0.623058243
07/15/98	12:42:49	6.96E+00	0:00:22	0.24	22.3	0.24	0.0	0.00	-0.623058243
07/15/98	12:42:49	6.96E+00	0:00:23	0.24	22.8	0.24	0.0	0.00	-0.623058243
07/15/98	12:42:50	6.96E+00	0:00:23	0.23	23.3	0.23	0.0	0.00	-0.629671992
07/15/98	12:42:51	6.96E+00	0:00:25	0.24	25.0	0.24	0.0	0.00	-0.623058243
07/15/98	12:42:52	6.96E+00	0:00:26	0.24	26.0	0.24	0.0	0.00	-0.623058243
07/15/98	12:42:53	6.96E+00	0:00:27	0.23	27.0	0.23	0.0	0.00	-0.629671992
07/15/98	12:42:54	6.96E+00	0:00:28	0.23	28.0	0.23	0.0	0.00	-0.629671992

MW13P Slug In

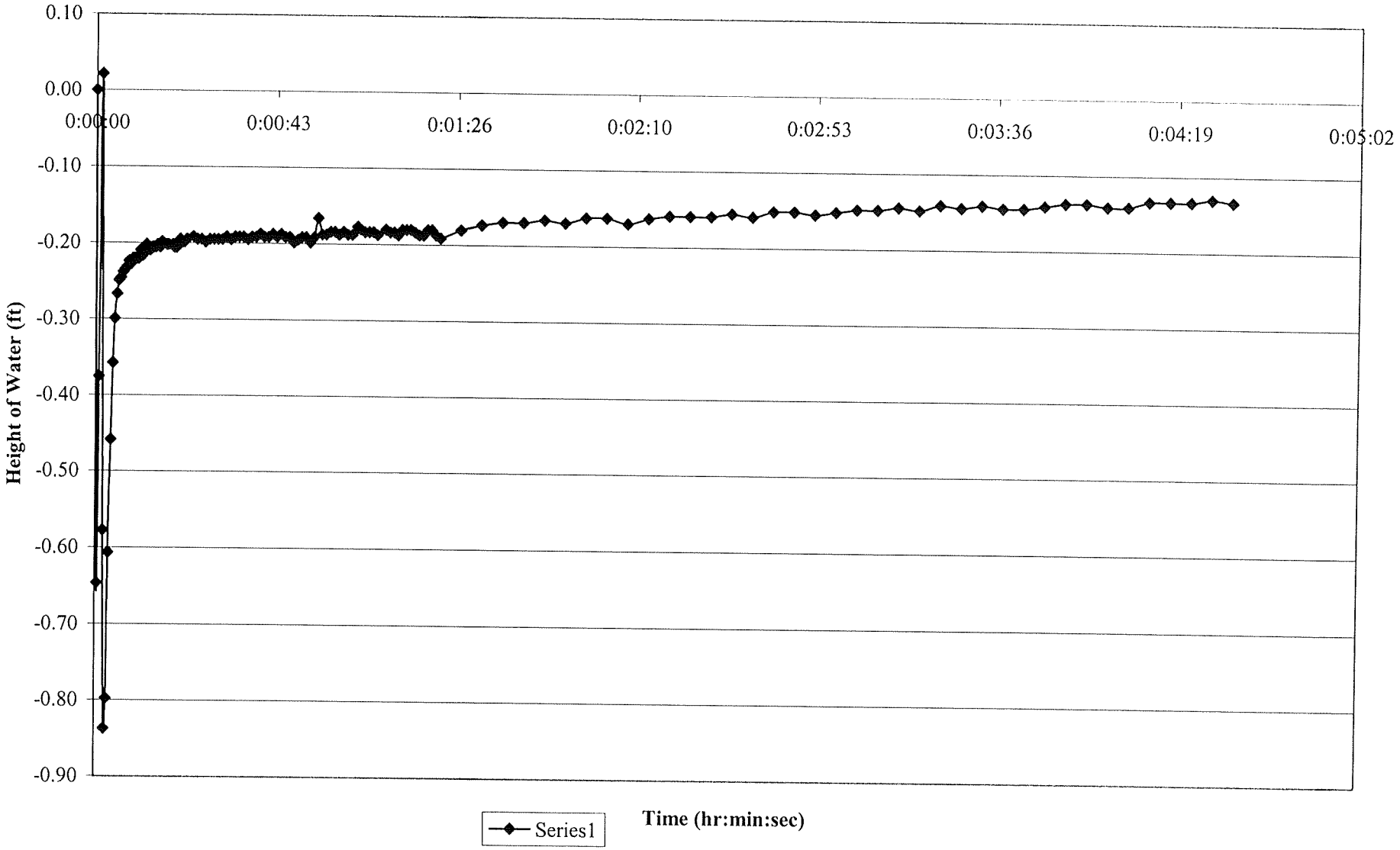
Date	Time	Analog#01 mw13p ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	12:42:55	6.96E+00	0:00:29	0.23	29.0	0.23	0.0	0.00	-0.629671992
07/15/98	12:42:56	6.95E+00	0:00:30	0.23	30.0	0.23	0.0	0.00	-0.63638802
07/15/98	12:42:57	6.96E+00	0:00:31	0.23	31.0	0.23	0.0	0.00	-0.629671992
07/15/98	12:42:58	6.95E+00	0:00:32	0.23	32.0	0.23	0.0	0.00	-0.63638802
07/15/98	12:42:59	6.95E+00	0:00:33	0.23	33.0	0.23	0.0	0.00	-0.63638802
07/15/98	12:43:00	6.95E+00	0:00:34	0.23	34.0	0.23	0.0	0.00	-0.63638802
07/15/98	12:43:01	6.95E+00	0:00:35	0.23	35.0	0.23	0.0	0.00	-0.63638802
07/15/98	12:43:02	6.95E+00	0:00:36	0.23	36.0	0.23	0.0	0.00	-0.643400564
07/15/98	12:43:03	6.95E+00	0:00:37	0.23	37.0	0.23	0.0	0.00	-0.643400564
07/15/98	12:43:04	6.95E+00	0:00:38	0.23	38.0	0.23	0.0	0.00	-0.643400564
07/15/98	12:43:05	6.95E+00	0:00:39	0.23	39.0	0.23	0.0	0.00	-0.63638802
07/15/98	12:43:06	6.95E+00	0:00:40	0.23	40.0	0.23	0.0	0.00	-0.643400564
07/15/98	12:43:07	6.95E+00	0:00:41	0.23	41.0	0.23	0.0	0.00	-0.643400564
07/15/98	12:43:08	6.95E+00	0:00:42	0.23	42.0	0.23	0.0	0.00	-0.643400564
07/15/98	12:43:09	6.95E+00	0:00:43	0.23	43.0	0.23	0.0	0.00	-0.63638802
07/15/98	12:43:10	6.95E+00	0:00:44	0.23	44.0	0.23	0.0	0.00	-0.643400564
07/15/98	12:43:11	6.95E+00	0:00:45	0.23	45.0	0.23	0.0	0.00	-0.63638802
07/15/98	12:43:12	6.94E+00	0:00:46	0.22	46.0	0.22	0.0	0.00	-0.650334016
07/15/98	12:43:13	6.94E+00	0:00:47	0.22	47.0	0.22	0.0	0.00	-0.650334016
07/15/98	12:43:14	6.94E+00	0:00:48	0.22	48.0	0.22	0.0	0.00	-0.657379957
07/15/98	12:43:15	6.94E+00	0:00:49	0.22	49.0	0.22	0.0	0.00	-0.657379957
07/15/98	12:43:17	6.94E+00	0:00:50	0.22	50.3	0.22	0.0	0.00	-0.664542099
07/15/98	12:43:17	6.94E+00	0:00:51	0.22	51.0	0.22	0.0	0.00	-0.657379957
07/15/98	12:43:18	6.94E+00	0:00:52	0.22	52.0	0.22	0.0	0.00	-0.664542099
07/15/98	12:43:19	6.94E+00	0:00:53	0.22	53.0	0.22	0.0	0.00	-0.657379957
07/15/98	12:43:20	6.94E+00	0:00:54	0.22	54.0	0.22	0.0	0.00	-0.664542099
07/15/98	12:43:21	6.94E+00	0:00:55	0.22	55.0	0.22	0.0	0.00	-0.657379957
07/15/98	12:43:22	6.94E+00	0:00:56	0.22	56.0	0.22	0.0	0.00	-0.664542099
07/15/98	12:43:23	6.94E+00	0:00:57	0.22	57.0	0.22	0.0	0.00	-0.657379957
07/15/98	12:43:24	6.94E+00	0:00:58	0.22	58.0	0.22	0.0	0.00	-0.664542099
07/15/98	12:43:25	6.94E+00	0:00:59	0.22	59.0	0.22	0.0	0.00	-0.664542099
07/15/98	12:43:26	6.94E+00	0:01:00	0.22	60.0	0.22	0.0	0.00	-0.664542099
07/15/98	12:43:27	6.94E+00	0:01:01	0.22	61.0	0.22	0.0	0.00	-0.664542099
07/15/98	12:43:28	6.94E+00	0:01:02	0.22	62.0	0.22	0.0	0.00	-0.664542099
07/15/98	12:43:29	6.93E+00	0:01:03	0.21	63.0	0.21	0.0	0.00	-0.671824339
07/15/98	12:43:30	6.94E+00	0:01:04	0.22	64.0	0.22	0.0	0.00	-0.664542099
07/15/98	12:43:31	6.93E+00	0:01:05	0.21	65.0	0.21	0.0	0.00	-0.671824339
07/15/98	12:43:32	6.93E+00	0:01:06	0.21	66.0	0.21	0.0	0.00	-0.671824339
07/15/98	12:43:33	6.93E+00	0:01:07	0.21	67.0	0.21	0.0	0.00	-0.671824339
07/15/98	12:43:34	6.93E+00	0:01:08	0.21	68.0	0.21	0.0	0.00	-0.679230772
07/15/98	12:43:35	6.93E+00	0:01:09	0.21	69.0	0.21	0.0	0.00	-0.671824339
07/15/98	12:43:36	6.93E+00	0:01:10	0.21	70.0	0.21	0.0	0.00	-0.679230772
07/15/98	12:43:37	6.93E+00	0:01:11	0.21	71.0	0.21	0.0	0.00	-0.679230772
07/15/98	12:43:38	6.93E+00	0:01:12	0.21	72.0	0.21	0.0	0.00	-0.679230772
07/15/98	12:43:39	6.93E+00	0:01:13	0.21	73.0	0.21	0.0	0.00	-0.679230772
07/15/98	12:43:40	6.93E+00	0:01:14	0.21	74.0	0.21	0.0	0.00	-0.686765708
07/15/98	12:43:41	6.93E+00	0:01:15	0.21	75.0	0.21	0.0	0.00	-0.686765708
07/15/98	12:43:42	6.93E+00	0:01:16	0.21	76.0	0.21	0.0	0.00	-0.686765708
07/15/98	12:43:43	6.93E+00	0:01:17	0.21	77.0	0.21	0.0	0.00	-0.686765708
07/15/98	12:43:45	6.93E+00	0:01:19	0.21	79.0	0.21	0.0	0.00	-0.686765708
07/15/98	12:43:46	6.93E+00	0:01:20	0.21	80.0	0.21	0.0	0.00	-0.686765708
07/15/98	12:43:47	6.93E+00	0:01:21	0.21	81.0	0.21	0.0	0.00	-0.686765708
07/15/98	12:43:48	6.93E+00	0:01:22	0.21	82.0	0.21	0.0	0.00	-0.686765708
07/15/98	12:43:49	6.92E+00	0:01:23	0.20	83.1	0.20	0.0	0.00	-0.694433686

 Terra8 Data File --> C:\TMP\946W13PA

MW13P Slug In

Date	Time	Analog#01 mw13p ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	12:43:54	6.93E+00	0:01:28	0.21	88.0	0.21	0.0	0.00	-0.686765708
07/15/98	12:43:59	6.92E+00	0:01:33	0.20	93.0	0.20	0.0	0.00	-0.694433686
07/15/98	12:44:04	6.92E+00	0:01:38	0.20	98.0	0.20	0.0	0.00	-0.702239489
07/15/98	12:44:09	6.92E+00	0:01:43	0.19	103.0	0.19	0.0	0.00	-0.710188161
07/15/98	12:44:14	6.92E+00	0:01:48	0.19	108.0	0.19	0.0	0.00	-0.710188161
07/15/98	12:44:19	6.91E+00	0:01:53	0.19	113.0	0.19	0.0	0.00	-0.726767166
07/15/98	12:44:24	6.91E+00	0:01:58	0.19	118.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:44:29	6.91E+00	0:02:03	0.19	123.0	0.19	0.0	0.00	-0.726767166
07/15/98	12:44:34	6.91E+00	0:02:08	0.19	128.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:44:39	6.91E+00	0:02:13	0.19	133.0	0.19	0.0	0.00	-0.726767166
07/15/98	12:44:44	6.91E+00	0:02:18	0.19	138.0	0.19	0.0	0.00	-0.726767166
07/15/98	12:44:49	6.91E+00	0:02:23	0.19	143.0	0.19	0.0	0.00	-0.726767166
07/15/98	12:44:54	6.90E+00	0:02:28	0.18	148.0	0.18	0.0	0.00	-0.735182177
07/15/98	12:44:59	6.90E+00	0:02:33	0.18	153.0	0.18	0.0	0.00	-0.735182177
07/15/98	12:45:04	6.90E+00	0:02:38	0.18	158.0	0.18	0.0	0.00	-0.743763467
07/15/98	12:45:09	6.90E+00	0:02:43	0.18	163.0	0.18	0.0	0.00	-0.752517739
07/15/98	12:45:14	6.90E+00	0:02:48	0.18	168.0	0.18	0.0	0.00	-0.752517739
07/15/98	12:45:19	6.90E+00	0:02:53	0.18	173.0	0.18	0.0	0.00	-0.752517739
07/15/98	12:45:24	6.90E+00	0:02:58	0.18	178.0	0.18	0.0	0.00	-0.752517739
07/15/98	12:45:29	6.89E+00	0:03:03	0.17	183.0	0.17	0.0	0.00	-0.761452112
07/15/98	12:45:34	6.89E+00	0:03:08	0.17	188.0	0.17	0.0	0.00	-0.761452112
07/15/98	12:45:39	6.89E+00	0:03:13	0.17	193.0	0.17	0.0	0.00	-0.770574152
07/15/98	12:45:44	6.89E+00	0:03:18	0.17	198.0	0.17	0.0	0.00	-0.770574152
07/15/98	12:45:49	6.89E+00	0:03:23	0.17	203.0	0.17	0.0	0.00	-0.770574152
07/15/98	12:45:54	6.88E+00	0:03:28	0.16	208.0	0.16	0.0	0.00	-0.789413975
07/15/98	12:45:59	6.88E+00	0:03:33	0.16	213.0	0.16	0.0	0.00	-0.789413975
07/15/98	12:46:04	6.88E+00	0:03:38	0.16	218.0	0.16	0.0	0.00	-0.789413975
07/15/98	12:46:09	6.88E+00	0:03:43	0.16	223.0	0.16	0.0	0.00	-0.789413975
07/15/98	12:46:14	6.88E+00	0:03:48	0.16	228.0	0.16	0.0	0.00	-0.789413975
07/15/98	12:46:19	6.88E+00	0:03:53	0.16	233.0	0.16	0.0	0.00	-0.789413975
07/15/98	12:46:24	6.88E+00	0:03:58	0.16	238.0	0.16	0.0	0.00	-0.799149502
07/15/98	12:46:29	6.88E+00	0:04:03	0.16	243.0	0.16	0.0	0.00	-0.809108283
07/15/98	12:46:34	6.88E+00	0:04:08	0.16	248.0	0.16	0.0	0.00	-0.809108283
07/15/98	12:46:39	6.88E+00	0:04:13	0.16	253.0	0.16	0.0	0.00	-0.809108283
07/15/98	12:46:44	6.87E+00	0:04:18	0.15	258.0	0.15	0.0	0.00	-0.819300799
07/15/98	12:46:49	6.88E+00	0:04:23	0.16	263.0	0.16	0.0	0.00	-0.809108283
07/15/98	12:46:54	6.87E+00	0:04:28	0.15	268.0	0.15	0.0	0.00	-0.819300799
07/15/98	12:46:59	6.87E+00	0:04:33	0.15	273.0	0.15	0.0	0.00	-0.819300799
07/15/98	12:47:04	6.87E+00	0:04:38	0.15	278.0	0.15	0.0	0.00	-0.819300799
07/15/98	12:47:09	6.87E+00	0:04:43	0.15	283.0	0.15	0.0	0.00	-0.830031826
07/15/98	12:47:14	6.87E+00	0:04:48	0.14	288.0	0.14	0.0	0.00	-0.840733669
07/15/98	12:47:19	6.87E+00	0:04:53	0.14	293.0	0.14	0.0	0.00	-0.840733669
07/15/98	12:47:24	6.87E+00	0:04:58	0.15	298.0	0.15	0.0	0.00	-0.830031826
07/15/98	12:47:29	6.86E+00	0:05:03	0.14	303.0	0.14	0.0	0.00	-0.851705903
07/15/98	12:47:34	6.87E+00	0:05:08	0.14	308.0	0.14	0.0	0.00	-0.840733669
07/15/98	12:47:39	6.87E+00	0:05:13	0.15	313.0	0.15	0.0	0.00	-0.830031826
07/15/98	12:47:44	6.86E+00	0:05:18	0.14	318.0	0.14	0.0	0.00	-0.851705903
07/15/98	12:47:49	6.86E+00	0:05:23	0.14	323.0	0.14	0.0	0.00	-0.851705903

Vernon Co. MW-13P Slug Out



08/25/2003

946W13PB.xls MW13Pb graph

MW13P Slug Out

Date	Time	Analog#01 mw13p..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	12:55:10	6.81E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
07/15/98	12:55:11	6.16E+00	0:00:00	-0.65	0.5	0.65	0.0	0.00	-0.189700259
07/15/98	12:55:11	6.44E+00	0:00:01	-0.38	0.9	0.38	0.0	0.00	-0.425505732
07/15/98	12:55:12	6.83E+00	0:00:01	0.02	1.4	0.02	0.0	0.00	-1.665546249
07/15/98	12:55:12	6.23E+00	0:00:02	-0.58	1.9	0.58	0.0	0.00	-0.238448011
07/15/98	12:55:13	5.97E+00	0:00:02	-0.84	2.3	0.84	0.0	0.00	-0.077067043
07/15/98	12:55:13	6.01E+00	0:00:03	-0.80	2.8	0.80	0.0	0.00	-0.098160408
07/15/98	12:55:13	6.20E+00	0:00:03	-0.61	3.2	0.61	0.0	0.00	-0.217240807
07/15/98	12:55:14	6.35E+00	0:00:04	-0.46	3.7	0.46	0.0	0.00	-0.338755391
07/15/98	12:55:15	6.45E+00	0:00:04	-0.36	4.2	0.36	0.0	0.00	-0.446966984
07/15/98	12:55:15	6.51E+00	0:00:05	-0.30	4.6	0.30	0.0	0.00	-0.523458191
07/15/98	12:55:15	6.54E+00	0:00:05	-0.27	5.1	0.27	0.0	0.00	-0.573326112
07/15/98	12:55:16	6.56E+00	0:00:06	-0.25	5.5	0.25	0.0	0.00	-0.603626272
07/15/98	12:55:16	6.57E+00	0:00:06	-0.25	6.0	0.25	0.0	0.00	-0.610125442
07/15/98	12:55:17	6.57E+00	0:00:06	-0.24	6.5	0.24	0.0	0.00	-0.623058243
07/15/98	12:55:17	6.58E+00	0:00:07	-0.23	6.9	0.23	0.0	0.00	-0.629671992
07/15/98	12:55:18	6.58E+00	0:00:07	-0.23	7.4	0.23	0.0	0.00	-0.63638802
07/15/98	12:55:18	6.59E+00	0:00:08	-0.22	7.8	0.22	0.0	0.00	-0.650139918
07/15/98	12:55:19	6.58E+00	0:00:08	-0.23	8.3	0.23	0.0	0.00	-0.64320954
07/15/98	12:55:19	6.59E+00	0:00:09	-0.22	8.8	0.22	0.0	0.00	-0.657182685
07/15/98	12:55:19	6.59E+00	0:00:09	-0.22	9.2	0.22	0.0	0.00	-0.657182685
07/15/98	12:55:20	6.59E+00	0:00:10	-0.22	9.7	0.22	0.0	0.00	-0.657182685
07/15/98	12:55:20	6.59E+00	0:00:10	-0.22	10.1	0.22	0.0	0.00	-0.657182685
07/15/98	12:55:21	6.60E+00	0:00:11	-0.21	10.6	0.21	0.0	0.00	-0.679023323
07/15/98	12:55:21	6.59E+00	0:00:11	-0.22	11.1	0.22	0.0	0.00	-0.664341548
07/15/98	12:55:22	6.60E+00	0:00:12	-0.21	11.5	0.21	0.0	0.00	-0.679023323
07/15/98	12:55:22	6.61E+00	0:00:12	-0.20	12.0	0.20	0.0	0.00	-0.694433686
07/15/98	12:55:23	6.61E+00	0:00:12	-0.21	12.4	0.21	0.0	0.00	-0.686765708
07/15/98	12:55:23	6.60E+00	0:00:13	-0.21	12.9	0.21	0.0	0.00	-0.679023323
07/15/98	12:55:24	6.61E+00	0:00:13	-0.21	13.4	0.21	0.0	0.00	-0.686765708
07/15/98	12:55:24	6.61E+00	0:00:14	-0.21	13.8	0.21	0.0	0.00	-0.686765708
07/15/98	12:55:25	6.61E+00	0:00:14	-0.21	14.3	0.21	0.0	0.00	-0.686765708
07/15/98	12:55:25	6.61E+00	0:00:15	-0.20	14.7	0.20	0.0	0.00	-0.694433686
07/15/98	12:55:25	6.61E+00	0:00:15	-0.21	15.2	0.21	0.0	0.00	-0.686765708
07/15/98	12:55:26	6.61E+00	0:00:16	-0.20	15.7	0.20	0.0	0.00	-0.702239489
07/15/98	12:55:27	6.61E+00	0:00:17	-0.20	16.8	0.20	0.0	0.00	-0.694433686
07/15/98	12:55:27	6.61E+00	0:00:17	-0.20	17.2	0.20	0.0	0.00	-0.694433686
07/15/98	12:55:28	6.61E+00	0:00:18	-0.20	18.2	0.20	0.0	0.00	-0.694433686
07/15/98	12:55:29	6.61E+00	0:00:19	-0.21	18.6	0.21	0.0	0.00	-0.686765708
07/15/98	12:55:29	6.61E+00	0:00:19	-0.21	19.1	0.21	0.0	0.00	-0.686765708
07/15/98	12:55:30	6.61E+00	0:00:19	-0.20	19.5	0.20	0.0	0.00	-0.702239489
07/15/98	12:55:30	6.62E+00	0:00:20	-0.19	20.0	0.19	0.0	0.00	-0.710188161
07/15/98	12:55:31	6.61E+00	0:00:20	-0.20	20.5	0.20	0.0	0.00	-0.702239489
07/15/98	12:55:31	6.61E+00	0:00:21	-0.20	20.9	0.20	0.0	0.00	-0.702239489

 Terra8 Data File --> C:\TMP\946W13PB

MW13P Slug Out

Date	Time	Analog#01 mw13p..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	12:55:32	6.62E+00	0:00:21	-0.19	21.5	0.19	0.0	0.00	-0.710188161
07/15/98	12:55:33	6.62E+00	0:00:23	-0.19	23.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:55:34	6.62E+00	0:00:24	-0.19	24.0	0.19	0.0	0.00	-0.710188161
07/15/98	12:55:35	6.62E+00	0:00:25	-0.19	25.0	0.19	0.0	0.00	-0.710188161
07/15/98	12:55:36	6.61E+00	0:00:26	-0.20	26.0	0.20	0.0	0.00	-0.702239489
07/15/98	12:55:37	6.62E+00	0:00:27	-0.19	27.0	0.19	0.0	0.00	-0.710188161
07/15/98	12:55:38	6.62E+00	0:00:28	-0.19	28.0	0.19	0.0	0.00	-0.710188161
07/15/98	12:55:39	6.62E+00	0:00:29	-0.19	29.0	0.19	0.0	0.00	-0.710188161
07/15/98	12:55:40	6.62E+00	0:00:30	-0.19	30.0	0.19	0.0	0.00	-0.710188161
07/15/98	12:55:41	6.62E+00	0:00:31	-0.19	31.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:55:42	6.62E+00	0:00:32	-0.19	32.0	0.19	0.0	0.00	-0.710188161
07/15/98	12:55:43	6.62E+00	0:00:33	-0.19	33.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:55:44	6.62E+00	0:00:34	-0.19	34.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:55:45	6.62E+00	0:00:35	-0.19	35.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:55:46	6.62E+00	0:00:36	-0.19	36.0	0.19	0.0	0.00	-0.710188161
07/15/98	12:55:47	6.62E+00	0:00:37	-0.19	37.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:55:48	6.62E+00	0:00:38	-0.19	38.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:55:49	6.62E+00	0:00:39	-0.19	39.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:55:50	6.62E+00	0:00:40	-0.19	40.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:55:51	6.62E+00	0:00:41	-0.19	41.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:55:52	6.62E+00	0:00:42	-0.19	42.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:55:53	6.62E+00	0:00:43	-0.19	43.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:55:54	6.62E+00	0:00:44	-0.19	44.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:55:55	6.62E+00	0:00:45	-0.19	45.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:55:56	6.62E+00	0:00:46	-0.19	46.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:55:57	6.61E+00	0:00:47	-0.20	47.0	0.20	0.0	0.00	-0.702239489
07/15/98	12:55:58	6.62E+00	0:00:48	-0.19	48.0	0.19	0.0	0.00	-0.710188161
07/15/98	12:55:59	6.62E+00	0:00:49	-0.19	49.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:56:00	6.62E+00	0:00:50	-0.19	50.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:56:01	6.61E+00	0:00:51	-0.20	51.0	0.20	0.0	0.00	-0.702239489
07/15/98	12:56:02	6.62E+00	0:00:52	-0.19	52.0	0.19	0.0	0.00	-0.71828503
07/15/98	12:56:03	6.64E+00	0:00:53	-0.17	53.0	0.17	0.0	0.00	-0.779891912
07/15/98	12:56:04	6.62E+00	0:00:54	-0.19	54.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:56:05	6.62E+00	0:00:55	-0.19	55.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:56:06	6.63E+00	0:00:56	-0.18	56.0	0.18	0.0	0.00	-0.734946211
07/15/98	12:56:07	6.63E+00	0:00:57	-0.18	57.0	0.18	0.0	0.00	-0.734946211
07/15/98	12:56:08	6.62E+00	0:00:58	-0.19	58.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:56:09	6.63E+00	0:00:59	-0.18	59.0	0.18	0.0	0.00	-0.734946211
07/15/98	12:56:10	6.62E+00	0:01:00	-0.19	60.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:56:11	6.62E+00	0:01:01	-0.19	61.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:56:13	6.63E+00	0:01:02	-0.18	62.3	0.18	0.0	0.00	-0.752272167
07/15/98	12:56:13	6.63E+00	0:01:03	-0.18	63.0	0.18	0.0	0.00	-0.743522794
07/15/98	12:56:14	6.63E+00	0:01:04	-0.18	64.0	0.18	0.0	0.00	-0.734946211
07/15/98	12:56:15	6.63E+00	0:01:05	-0.18	65.0	0.18	0.0	0.00	-0.734946211

MW13P Slug Out

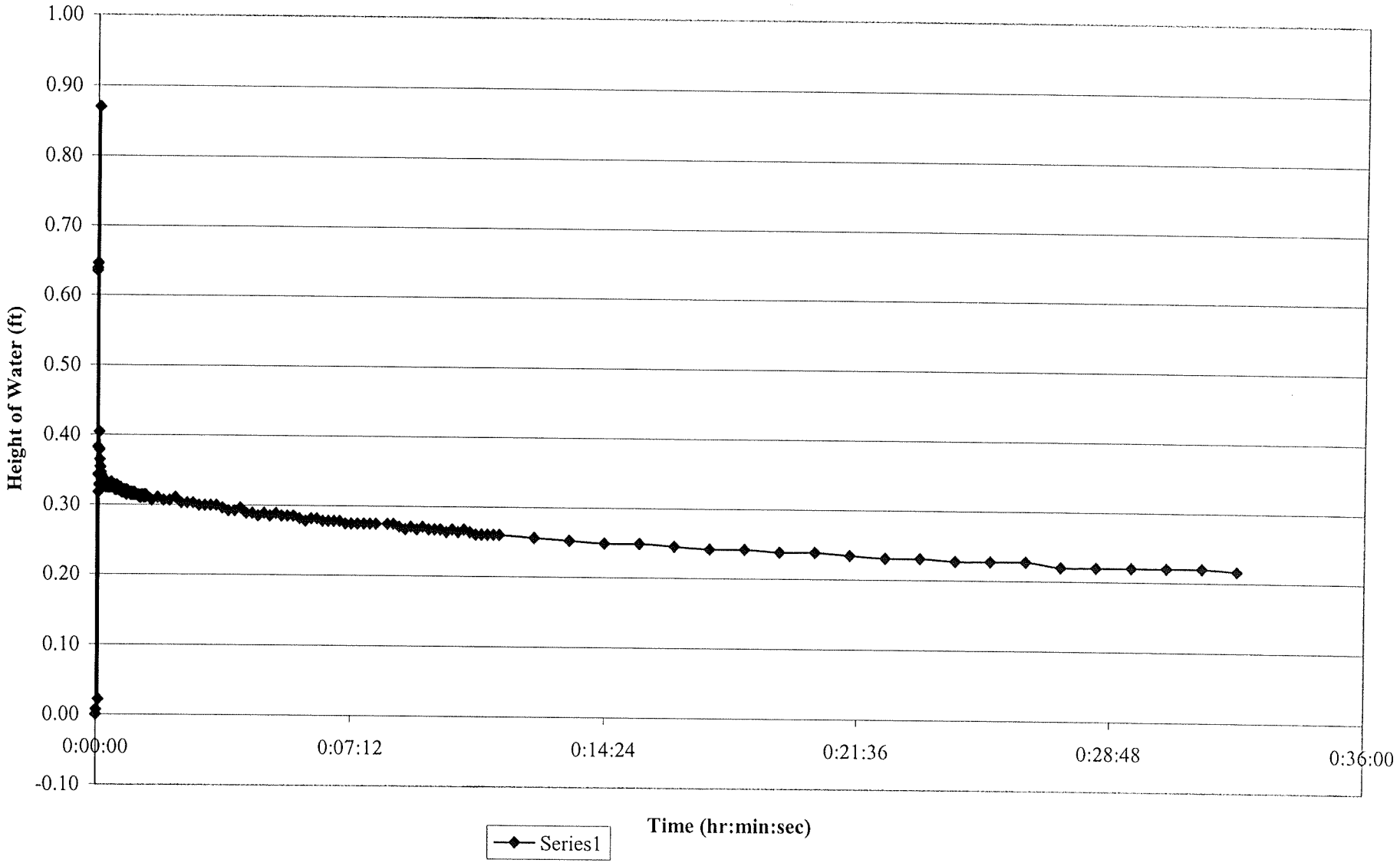
Date	Time	Analog#01 mw13p..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	12:56:16	6.63E+00	0:01:06	-0.18	66.0	0.18	0.0	0.00	-0.734946211
07/15/98	12:56:17	6.62E+00	0:01:07	-0.19	67.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:56:19	6.63E+00	0:01:09	-0.18	69.0	0.18	0.0	0.00	-0.743522794
07/15/98	12:56:20	6.63E+00	0:01:10	-0.18	70.0	0.18	0.0	0.00	-0.734946211
07/15/98	12:56:21	6.63E+00	0:01:11	-0.18	71.0	0.18	0.0	0.00	-0.734946211
07/15/98	12:56:22	6.62E+00	0:01:12	-0.19	72.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:56:23	6.63E+00	0:01:13	-0.18	73.0	0.18	0.0	0.00	-0.743522794
07/15/98	12:56:24	6.63E+00	0:01:14	-0.18	74.0	0.18	0.0	0.00	-0.743522794
07/15/98	12:56:25	6.63E+00	0:01:15	-0.18	75.0	0.18	0.0	0.00	-0.743522794
07/15/98	12:56:26	6.63E+00	0:01:16	-0.18	76.0	0.18	0.0	0.00	-0.734946211
07/15/98	12:56:27	6.62E+00	0:01:17	-0.19	77.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:56:28	6.62E+00	0:01:18	-0.19	78.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:56:29	6.63E+00	0:01:19	-0.18	79.0	0.18	0.0	0.00	-0.743522794
07/15/98	12:56:30	6.63E+00	0:01:20	-0.18	80.0	0.18	0.0	0.00	-0.743522794
07/15/98	12:56:31	6.62E+00	0:01:21	-0.19	81.0	0.19	0.0	0.00	-0.726535727
07/15/98	12:56:32	6.62E+00	0:01:22	-0.19	82.1	0.19	0.0	0.00	-0.71828503
07/15/98	12:56:37	6.63E+00	0:01:27	-0.18	87.0	0.18	0.0	0.00	-0.743522794
07/15/98	12:56:42	6.64E+00	0:01:32	-0.17	92.0	0.17	0.0	0.00	-0.761201437
07/15/98	12:56:47	6.64E+00	0:01:37	-0.17	97.0	0.17	0.0	0.00	-0.770574152
07/15/98	12:56:52	6.64E+00	0:01:42	-0.17	102.0	0.17	0.0	0.00	-0.770574152
07/15/98	12:56:57	6.64E+00	0:01:47	-0.17	107.0	0.17	0.0	0.00	-0.779891912
07/15/98	12:57:02	6.64E+00	0:01:52	-0.17	112.0	0.17	0.0	0.00	-0.770574152
07/15/98	12:57:07	6.65E+00	0:01:57	-0.16	117.0	0.16	0.0	0.00	-0.789413975
07/15/98	12:57:12	6.65E+00	0:02:02	-0.16	122.0	0.16	0.0	0.00	-0.789413975
07/15/98	12:57:17	6.64E+00	0:02:07	-0.17	127.0	0.17	0.0	0.00	-0.770574152
07/15/98	12:57:22	6.65E+00	0:02:12	-0.16	132.0	0.16	0.0	0.00	-0.789413975
07/15/98	12:57:27	6.65E+00	0:02:17	-0.16	137.0	0.16	0.0	0.00	-0.799149502
07/15/98	12:57:32	6.65E+00	0:02:22	-0.16	142.0	0.16	0.0	0.00	-0.799149502
07/15/98	12:57:37	6.65E+00	0:02:27	-0.16	147.0	0.16	0.0	0.00	-0.799149502
07/15/98	12:57:42	6.66E+00	0:02:32	-0.16	152.0	0.16	0.0	0.00	-0.809108283
07/15/98	12:57:47	6.65E+00	0:02:37	-0.16	157.0	0.16	0.0	0.00	-0.799149502
07/15/98	12:57:52	6.66E+00	0:02:42	-0.15	162.0	0.15	0.0	0.00	-0.819300799
07/15/98	12:57:57	6.66E+00	0:02:47	-0.15	167.0	0.15	0.0	0.00	-0.819300799
07/15/98	12:58:02	6.66E+00	0:02:52	-0.16	172.0	0.16	0.0	0.00	-0.809108283
07/15/98	12:58:07	6.66E+00	0:02:57	-0.15	177.0	0.15	0.0	0.00	-0.819300799
07/15/98	12:58:12	6.66E+00	0:03:02	-0.15	182.0	0.15	0.0	0.00	-0.829738285
07/15/98	12:58:17	6.66E+00	0:03:07	-0.15	187.0	0.15	0.0	0.00	-0.829738285
07/15/98	12:58:22	6.67E+00	0:03:12	-0.14	192.0	0.14	0.0	0.00	-0.840432807
07/15/98	12:58:27	6.66E+00	0:03:17	-0.15	197.0	0.15	0.0	0.00	-0.829738285
07/15/98	12:58:32	6.6701	0:03:22	-0.14	202.0	0.14	0.0	0.00	-0.851397345
07/15/98	12:58:37	6.6665	0:03:27	-0.14	207.0	0.14	0.0	0.00	-0.840432807
07/15/98	12:58:42	6.6701	0:03:32	-0.14	212.0	0.14	0.0	0.00	-0.851397345
07/15/98	12:58:47	6.6665	0:03:37	-0.14	217.0	0.14	0.0	0.00	-0.840432807
07/15/98	12:58:52	6.6665	0:03:42	-0.14	222.0	0.14	0.0	0.00	-0.840432807

Page # 1 Terra8 Data File --> C:\TMP\946W13PB

MW13P Slug Out

Date	Time	Analog#01 mw13p..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
07/15/98	12:58:57	6.6701	0:03:47	-0.14	227.0	0.14	0.0	0.00	-0.851397345
07/15/98	12:59:02	6.6737	0:03:52	-0.14	232.0	0.14	0.0	0.00	-0.862645889
07/15/98	12:59:07	6.6737	0:03:57	-0.14	237.0	0.14	0.0	0.00	-0.862645889
07/15/98	12:59:12	6.6701	0:04:02	-0.14	242.0	0.14	0.0	0.00	-0.851397345
07/15/98	12:59:17	6.6701	0:04:07	-0.14	247.0	0.14	0.0	0.00	-0.851397345
07/15/98	12:59:22	6.6773	0:04:12	-0.13	252.0	0.13	0.0	0.00	-0.874193542
07/15/98	12:59:27	6.6773	0:04:17	-0.13	257.0	0.13	0.0	0.00	-0.874193542
07/15/98	12:59:32	6.6773	0:04:22	-0.13	262.0	0.13	0.0	0.00	-0.874193542
07/15/98	12:59:37	6.681	0:04:27	-0.13	267.0	0.13	0.0	0.00	-0.886390849
07/15/98	12:59:42	6.6773	0:04:32	-0.13	272.0	0.13	0.0	0.00	-0.874193542

Vernon Co. MW-14 Slug In



06/16/2003

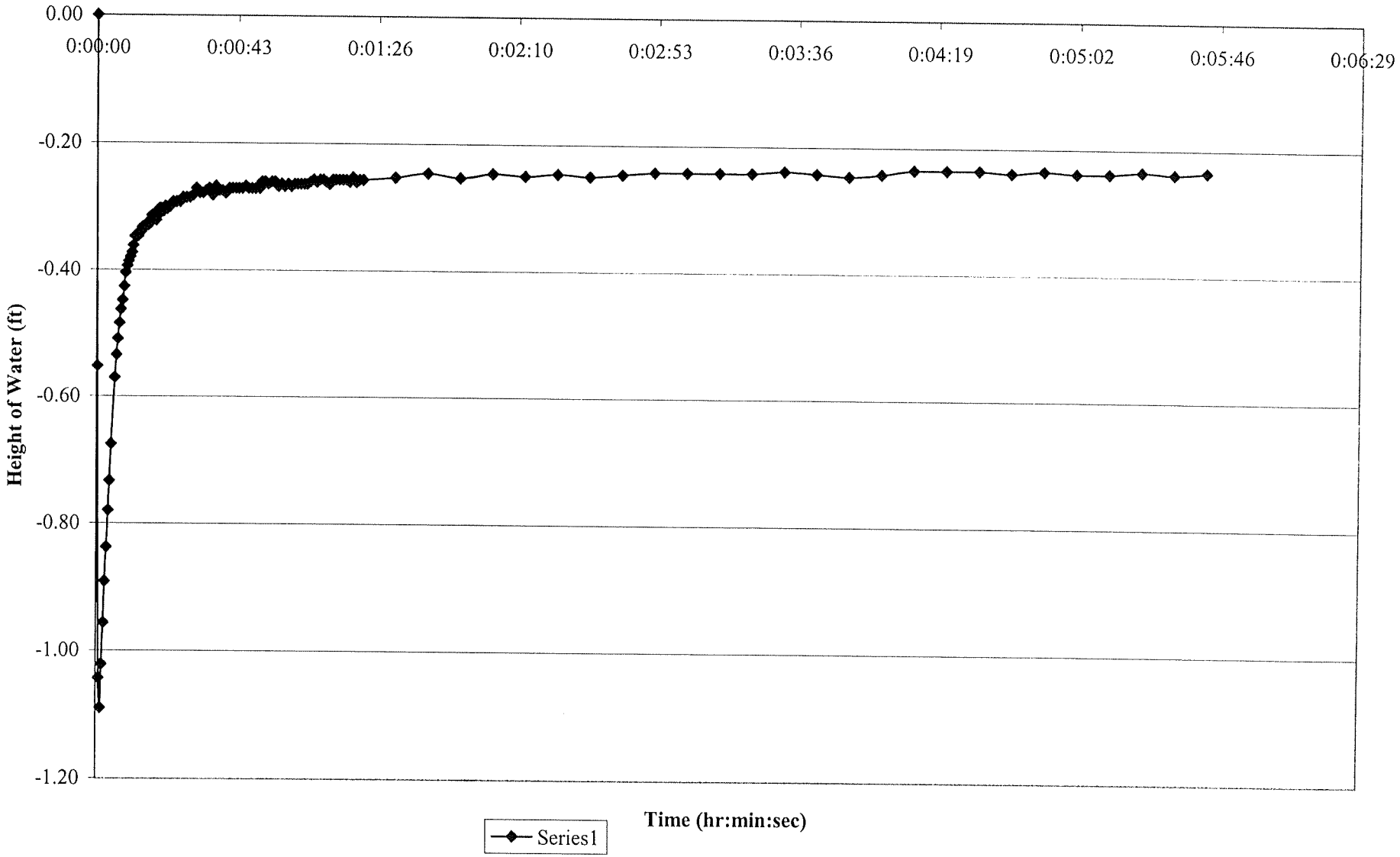
0946W14a.xls MW14a graph

Time	MW-14 Slug In Analog#01 mw14..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
10:54:31	4.14E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
10:54:32	4.15E+00	0:00:01	0.01	0.5	0.01	0.5	0.01	-2.142667504
10:54:32	4.78E+00	0:00:01	0.64	1.0	0.64	1.0	0.64	-0.197089511
10:54:33	4.78E+00	0:00:01	0.64	1.4	0.64	1.4	0.64	-0.194635093
10:54:33	4.79E+00	0:00:02	0.65	1.9	0.65	1.9	0.65	-0.189767482
10:54:34	4.52E+00	0:00:02	0.38	2.3	0.38	2.3	0.38	-0.417368561
10:54:34	4.48E+00	0:00:03	0.34	2.8	0.34	2.8	0.34	-0.464959187
10:54:35	4.46E+00	0:00:03	0.32	3.3	0.32	3.3	0.32	-0.498119506
10:54:35	5.01E+00	0:00:04	0.87	3.7	0.87	3.7	0.87	-0.060580597
10:54:36	4.16E+00	0:00:04	0.02	4.2	0.02	4.2	0.02	-1.665546249
10:54:36	4.47E+00	0:00:05	0.33	4.6	0.33	4.6	0.33	-0.483596852
10:54:37	4.54E+00	0:00:05	0.40	5.1	0.40	5.1	0.40	-0.393403691
10:54:37	4.52E+00	0:00:06	0.38	5.6	0.38	5.6	0.38	-0.421475395
10:54:37	4.50E+00	0:00:06	0.36	6.0	0.36	6.0	0.36	-0.438302467
10:54:38	4.49E+00	0:00:07	0.35	6.5	0.35	6.5	0.35	-0.45136494
10:54:38	4.49E+00	0:00:07	0.35	6.9	0.35	6.9	0.35	-0.45136494
10:54:39	4.49E+00	0:00:07	0.35	7.4	0.35	7.4	0.35	-0.460296761
10:54:39	4.48E+00	0:00:08	0.34	7.9	0.34	7.9	0.34	-0.464959187
10:54:40	4.48E+00	0:00:08	0.34	8.3	0.34	8.3	0.34	-0.464959187
10:54:40	4.48E+00	0:00:09	0.34	8.8	0.34	8.8	0.34	-0.474178048
10:54:41	4.48E+00	0:00:09	0.34	9.2	0.34	9.2	0.34	-0.474178048
10:54:41	4.48E+00	0:00:10	0.34	9.7	0.34	9.7	0.34	-0.474178048
10:54:42	4.48E+00	0:00:10	0.34	10.2	0.34	10.2	0.34	-0.469544156
10:54:42	4.47E+00	0:00:11	0.33	10.6	0.33	10.6	0.33	-0.478861916
10:54:43	4.48E+00	0:00:11	0.34	11.1	0.34	11.1	0.34	-0.474178048
10:54:43	4.47E+00	0:00:12	0.33	11.6	0.33	11.6	0.33	-0.478861916
10:54:43	4.48E+00	0:00:12	0.34	12.0	0.34	12.0	0.34	-0.474178048
10:54:44	4.48E+00	0:00:13	0.34	12.5	0.34	12.5	0.34	-0.474178048
10:54:44	4.47E+00	0:00:13	0.33	12.9	0.33	12.9	0.33	-0.483596852
10:54:45	4.47E+00	0:00:13	0.33	13.4	0.33	13.4	0.33	-0.478861916
10:54:45	4.48E+00	0:00:14	0.34	13.9	0.34	13.9	0.34	-0.474178048
10:54:46	4.47E+00	0:00:14	0.33	14.3	0.33	14.3	0.33	-0.483596852
10:54:46	4.47E+00	0:00:15	0.33	14.8	0.33	14.8	0.33	-0.483596852
10:54:47	4.47E+00	0:00:15	0.33	15.2	0.33	15.2	0.33	-0.478861916
10:54:47	4.47E+00	0:00:16	0.33	15.7	0.33	15.7	0.33	-0.478861916
10:54:48	4.46E+00	0:00:16	0.32	16.2	0.32	16.2	0.32	-0.488383979
10:54:48	4.47E+00	0:00:17	0.33	16.6	0.33	16.6	0.33	-0.483596852
10:54:48	4.47E+00	0:00:17	0.33	17.1	0.33	17.1	0.33	-0.478861916
10:54:49	4.47E+00	0:00:17	0.33	17.5	0.33	17.5	0.33	-0.483596852
10:54:49	4.47E+00	0:00:18	0.33	18.0	0.33	18.0	0.33	-0.478861916
10:54:50	4.47E+00	0:00:18	0.33	18.5	0.33	18.5	0.33	-0.483596852
10:54:50	4.46E+00	0:00:19	0.32	18.9	0.32	18.9	0.32	-0.488383979
10:54:51	4.46E+00	0:00:19	0.32	19.4	0.32	19.4	0.32	-0.488383979
10:54:51	4.47E+00	0:00:20	0.33	19.8	0.33	19.8	0.33	-0.483596852
10:54:52	4.46E+00	0:00:20	0.32	20.3	0.32	20.3	0.32	-0.488383979
10:54:52	4.46E+00	0:00:21	0.32	20.8	0.32	20.8	0.32	-0.488383979
10:54:53	4.47E+00	0:00:21	0.33	21.2	0.33	21.2	0.33	-0.483596852
10:54:53	4.46E+00	0:00:22	0.32	21.7	0.32	21.7	0.32	-0.488383979
10:54:53	4.46E+00	0:00:22	0.32	22.1	0.32	22.1	0.32	-0.488383979
10:54:54	4.47E+00	0:00:23	0.33	22.6	0.33	22.6	0.33	-0.483596852
10:54:54	4.47E+00	0:00:23	0.33	23.1	0.33	23.1	0.33	-0.483596852
10:54:55	4.47E+00	0:00:24	0.33	23.5	0.33	23.5	0.33	-0.483596852
10:54:56	4.46E+00	0:00:24	0.32	24.1	0.32	24.1	0.32	-0.488383979
10:54:56	4.46E+00	0:00:25	0.32	24.9	0.32	24.9	0.32	-0.488383979
10:54:57	4.47E+00	0:00:26	0.33	25.9	0.33	25.9	0.33	-0.478861916

Time	MW-14 Slug In Analog#01 mw14..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
10:54:58	4.47E+00	0:00:27	0.33	26.9	0.33	26.9	0.33	-0.483596852
10:55:00	4.46E+00	0:00:28	0.32	28.2	0.32	28.2	0.32	-0.488383979
10:55:00	4.47E+00	0:00:29	0.33	28.9	0.33	28.9	0.33	-0.483596852
10:55:01	4.46E+00	0:00:30	0.32	29.9	0.32	29.9	0.32	-0.488383979
10:55:02	4.47E+00	0:00:31	0.33	30.9	0.33	30.9	0.33	-0.483596852
10:55:03	4.46E+00	0:00:32	0.32	31.9	0.32	31.9	0.32	-0.493224463
10:55:04	4.46E+00	0:00:33	0.32	32.9	0.32	32.9	0.32	-0.488383979
10:55:05	4.46E+00	0:00:34	0.32	33.9	0.32	33.9	0.32	-0.493224463
10:55:06	4.47E+00	0:00:35	0.33	34.9	0.33	34.9	0.33	-0.483596852
10:55:07	4.46E+00	0:00:36	0.32	35.9	0.32	35.9	0.32	-0.488383979
10:55:08	4.46E+00	0:00:37	0.32	36.9	0.32	36.9	0.32	-0.493224463
10:55:09	4.46E+00	0:00:38	0.32	37.9	0.32	37.9	0.32	-0.493224463
10:55:10	4.46E+00	0:00:39	0.32	38.9	0.32	38.9	0.32	-0.488383979
10:55:11	4.46E+00	0:00:40	0.32	39.9	0.32	39.9	0.32	-0.488383979
10:55:12	4.4648	0:00:41	0.32	40.9	0.32	40.9	0.32	-0.488383979
10:55:13	4.4612	0:00:42	0.32	41.9	0.32	41.9	0.32	-0.493224463
10:55:14	4.4576	0:00:43	0.32	42.9	0.32	42.9	0.32	-0.498119506
10:55:15	4.4576	0:00:44	0.32	43.9	0.32	43.9	0.32	-0.498119506
10:55:16	4.4612	0:00:45	0.32	44.9	0.32	44.9	0.32	-0.493224463
10:55:17	4.4612	0:00:46	0.32	45.9	0.32	45.9	0.32	-0.493224463
10:55:18	4.4576	0:00:47	0.32	46.9	0.32	46.9	0.32	-0.498119506
10:55:19	4.4612	0:00:48	0.32	47.9	0.32	47.9	0.32	-0.493224463
10:55:20	4.4576	0:00:49	0.32	48.9	0.32	48.9	0.32	-0.498119506
10:55:21	4.46E+00	0:00:50	0.32	49.9	0.32	49.9	0.32	-0.498119506
10:55:22	4.454	0:00:51	0.31	50.9	0.31	50.9	0.31	-0.503070352
10:55:23	4.4612	0:00:52	0.32	51.9	0.32	51.9	0.32	-0.493224463
10:55:24	4.4576	0:00:53	0.32	52.9	0.32	52.9	0.32	-0.498119506
10:55:25	4.4576	0:00:54	0.32	53.9	0.32	53.9	0.32	-0.498119506
10:55:26	4.4576	0:00:55	0.32	54.9	0.32	54.9	0.32	-0.498119506
10:55:27	4.4576	0:00:56	0.32	55.9	0.32	55.9	0.32	-0.498119506
10:55:28	4.4576	0:00:57	0.32	56.9	0.32	56.9	0.32	-0.498119506
10:55:29	4.454	0:00:58	0.31	57.9	0.31	57.9	0.31	-0.503070352
10:55:30	4.4576	0:00:59	0.32	58.9	0.32	58.9	0.32	-0.498119506
10:55:31	4.454	0:01:00	0.31	59.9	0.31	59.9	0.31	-0.503070352
10:55:32	4.4576	0:01:01	0.32	60.9	0.32	60.9	0.32	-0.498119506
10:55:33	4.454	0:01:02	0.31	61.9	0.31	61.9	0.31	-0.503070352
10:55:34	4.454	0:01:03	0.31	62.9	0.31	62.9	0.31	-0.503070352
10:55:35	4.454	0:01:04	0.31	63.9	0.31	63.9	0.31	-0.503070352
10:55:36	4.4576	0:01:05	0.32	64.9	0.32	64.9	0.32	-0.498119506
10:55:37	4.454	0:01:06	0.31	65.9	0.31	65.9	0.31	-0.503070352
10:55:38	4.454	0:01:07	0.31	66.9	0.31	66.9	0.31	-0.503070352
10:55:39	4.454	0:01:08	0.31	67.9	0.31	67.9	0.31	-0.503070352
10:55:40	4.454	0:01:09	0.31	68.9	0.31	68.9	0.31	-0.503070352
10:55:41	4.45E+00	0:01:10	0.31	69.9	0.31	69.9	0.31	-0.503070352
10:55:42	4.45E+00	0:01:11	0.31	70.9	0.31	70.9	0.31	-0.503070352
10:55:43	4.45E+00	0:01:12	0.31	71.9	0.31	71.9	0.31	-0.503070352
10:55:45	4.45E+00	0:01:13	0.31	73.2	0.31	73.2	0.31	-0.508078287
10:55:45	4.45E+00	0:01:14	0.31	73.9	0.31	73.9	0.31	-0.508078287
10:55:46	4.45E+00	0:01:15	0.31	74.9	0.31	74.9	0.31	-0.508078287
10:55:47	4.45E+00	0:01:16	0.31	75.9	0.31	75.9	0.31	-0.508078287
10:55:48	4.45E+00	0:01:17	0.31	76.9	0.31	76.9	0.31	-0.503070352
10:55:49	4.45E+00	0:01:18	0.31	77.9	0.31	77.9	0.31	-0.503070352
10:55:50	4.45E+00	0:01:19	0.31	78.9	0.31	78.9	0.31	-0.503070352
10:55:51	4.45E+00	0:01:20	0.31	79.9	0.31	79.9	0.31	-0.503070352
10:55:52	4.45E+00	0:01:21	0.31	80.9	0.31	80.9	0.31	-0.508078287

Time	MW-14 Slug In Analog#01 mw14..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
10:55:53	4.45E+00	0:01:22	0.31	81.9	0.31	81.9	0.31	-0.503070352
10:55:54	4.45E+00	0:01:23	0.31	82.9	0.31	82.9	0.31	-0.508078287
10:55:55	4.45E+00	0:01:24	0.31	84.0	0.31	84.0	0.31	-0.503070352
10:56:05	4.45E+00	0:01:34	0.31	93.9	0.31	93.9	0.31	-0.513144645
10:56:15	4.45E+00	0:01:44	0.31	103.9	0.31	103.9	0.31	-0.508078287
10:56:25	4.45E+00	0:01:54	0.31	113.9	0.31	113.9	0.31	-0.513144645
10:56:35	4.45E+00	0:02:04	0.31	123.9	0.31	123.9	0.31	-0.513144645
10:56:45	4.45E+00	0:02:14	0.31	133.9	0.31	133.9	0.31	-0.508078287
10:56:55	4.44E+00	0:02:24	0.30	143.9	0.30	143.9	0.30	-0.518414064
10:57:05	4.44E+00	0:02:34	0.30	153.9	0.30	153.9	0.30	-0.518414064
10:57:15	4.44E+00	0:02:44	0.30	163.9	0.30	163.9	0.30	-0.518414064
10:57:25	4.44E+00	0:02:54	0.30	173.9	0.30	173.9	0.30	-0.523603173
10:57:35	4.44E+00	0:03:04	0.30	183.9	0.30	183.9	0.30	-0.523603173
10:57:45	4.44E+00	0:03:14	0.30	193.9	0.30	193.9	0.30	-0.523603173
10:57:55	4.44E+00	0:03:24	0.30	203.9	0.30	203.9	0.30	-0.523603173
10:58:05	4.44E+00	0:03:34	0.30	213.9	0.30	213.9	0.30	-0.528855035
10:58:15	4.43E+00	0:03:44	0.29	223.9	0.29	223.9	0.29	-0.534171185
10:58:25	4.43E+00	0:03:54	0.29	233.9	0.29	233.9	0.29	-0.534171185
10:58:35	4.44E+00	0:04:04	0.30	243.9	0.30	243.9	0.30	-0.528855035
10:58:45	4.43E+00	0:04:14	0.29	253.9	0.29	253.9	0.29	-0.539553216
10:58:55	4.43E+00	0:04:24	0.29	263.9	0.29	263.9	0.29	-0.539553216
10:59:05	4.43E+00	0:04:34	0.29	273.9	0.29	273.9	0.29	-0.545002783
10:59:15	4.43E+00	0:04:44	0.29	283.9	0.29	283.9	0.29	-0.539553216
10:59:25	4.43E+00	0:04:54	0.29	293.9	0.29	293.9	0.29	-0.545002783
10:59:35	4.43E+00	0:05:04	0.29	303.9	0.29	303.9	0.29	-0.539553216
10:59:45	4.43E+00	0:05:14	0.29	313.9	0.29	313.9	0.29	-0.545002783
10:59:55	4.43E+00	0:05:24	0.29	323.9	0.29	323.9	0.29	-0.545002783
11:00:05	4.43E+00	0:05:34	0.29	333.9	0.29	333.9	0.29	-0.545002783
11:00:15	4.42E+00	0:05:44	0.28	343.9	0.28	343.9	0.28	-0.550521601
11:00:25	4.42E+00	0:05:54	0.28	353.9	0.28	353.9	0.28	-0.556111453
11:00:35	4.42E+00	0:06:04	0.28	363.9	0.28	363.9	0.28	-0.550521601
11:00:45	4.42E+00	0:06:14	0.28	373.9	0.28	373.9	0.28	-0.550521601
11:00:55	4.42E+00	0:06:24	0.28	383.9	0.28	383.9	0.28	-0.556111453
11:01:05	4.42E+00	0:06:34	0.28	393.9	0.28	393.9	0.28	-0.556111453
11:01:15	4.42E+00	0:06:44	0.28	403.9	0.28	403.9	0.28	-0.556111453
11:01:25	4.42E+00	0:06:54	0.28	413.9	0.28	413.9	0.28	-0.556111453
11:01:35	4.41E+00	0:07:04	0.27	423.9	0.27	423.9	0.27	-0.561774192
11:01:45	4.41E+00	0:07:14	0.27	433.9	0.27	433.9	0.27	-0.561774192
11:01:55	4.41E+00	0:07:24	0.27	443.9	0.27	443.9	0.27	-0.561774192
11:02:05	4.41E+00	0:07:34	0.27	453.9	0.27	453.9	0.27	-0.561774192
11:02:15	4.41E+00	0:07:44	0.27	463.9	0.27	463.9	0.27	-0.561774192
11:02:25	4.41E+00	0:07:54	0.27	473.9	0.27	473.9	0.27	-0.561774192
11:02:45	4.41E+00	0:08:14	0.27	493.9	0.27	493.9	0.27	-0.561774192
11:02:55	4.41E+00	0:08:24	0.27	503.9	0.27	503.9	0.27	-0.561774192
11:03:05	4.41E+00	0:08:34	0.27	513.9	0.27	513.9	0.27	-0.567511744
11:03:15	4.41E+00	0:08:44	0.27	523.9	0.27	523.9	0.27	-0.573488739
11:03:25	4.41E+00	0:08:54	0.27	533.9	0.27	533.9	0.27	-0.567511744
11:03:35	4.41E+00	0:09:04	0.27	543.9	0.27	543.9	0.27	-0.573488739
11:03:45	4.41E+00	0:09:14	0.27	553.9	0.27	553.9	0.27	-0.567511744
11:03:55	4.41E+00	0:09:24	0.27	563.9	0.27	563.9	0.27	-0.573488739
11:04:05	4.41E+00	0:09:34	0.27	573.9	0.27	573.9	0.27	-0.573488739
11:04:15	4.41E+00	0:09:44	0.27	583.9	0.27	583.9	0.27	-0.573488739
11:04:25	4.40E+00	0:09:54	0.26	593.9	0.26	593.9	0.26	-0.579384229
11:04:35	4.41E+00	0:10:04	0.27	603.9	0.27	603.9	0.27	-0.573488739

Vernon Co. MW-14 Slug Out

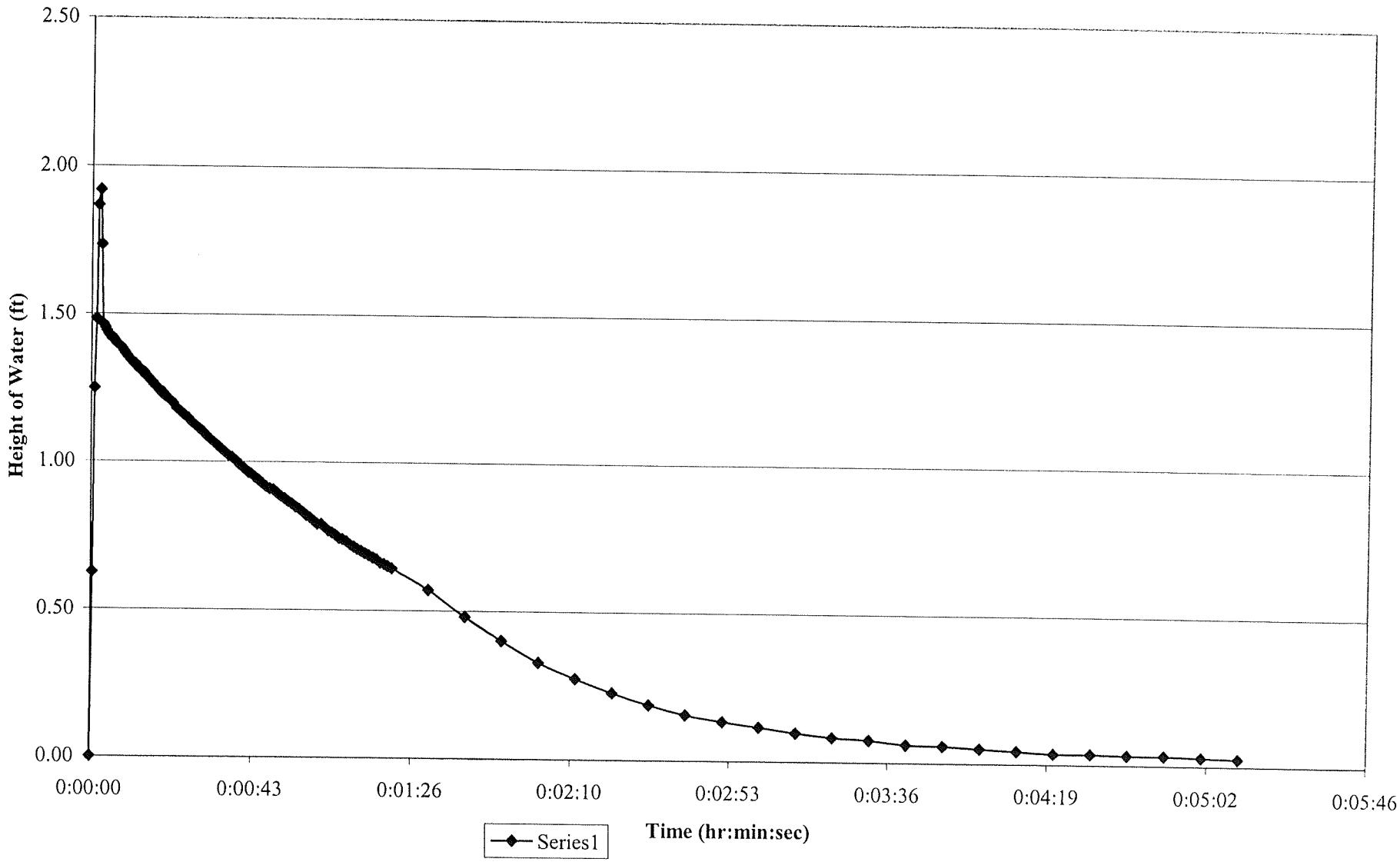


Time	MW-14 Slug Out Analog#01 mw14..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
11:31:27	4.34E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
11:31:27	3.79E+00	0:00:00	-0.55	0.4	0.55	0.0	0.00	-0.257824957
11:31:28	3.30E+00	0:00:01	-1.04	0.9	1.04	0.0	0.00	0.018325945
11:31:28	3.25E+00	0:00:01	-1.09	1.4	1.09	0.0	0.00	0.03746634
11:31:29	3.32E+00	0:00:02	-1.02	1.8	1.02	0.0	0.00	0.009238371
11:31:29	3.39E+00	0:00:02	-0.96	2.3	0.96	0.0	0.00	-0.019315026
11:31:30	3.45E+00	0:00:03	-0.89	2.7	0.89	0.0	0.00	-0.049878652
11:31:30	3.50E+00	0:00:03	-0.84	3.2	0.84	0.0	0.00	-0.077067043
11:31:31	3.56E+00	0:00:04	-0.78	3.7	0.78	0.0	0.00	-0.10812817
11:31:31	3.61E+00	0:00:04	-0.73	4.1	0.73	0.0	0.00	-0.135073808
11:31:32	3.67E+00	0:00:05	-0.68	4.6	0.68	0.0	0.00	-0.170696227
11:31:33	3.77E+00	0:00:06	-0.57	5.7	0.57	0.0	0.00	-0.243896628
11:31:33	3.81E+00	0:00:06	-0.53	6.2	0.53	0.0	0.00	-0.272296116
11:31:33	3.83E+00	0:00:07	-0.51	6.6	0.51	0.0	0.00	-0.293367549
11:31:34	3.86E+00	0:00:07	-0.48	7.1	0.48	0.0	0.00	-0.315423913
11:31:34	3.88E+00	0:00:07	-0.46	7.5	0.46	0.0	0.00	-0.335358024
11:31:35	3.89E+00	0:00:08	-0.45	8.0	0.45	0.0	0.00	-0.349109922
11:31:35	3.92E+00	0:00:09	-0.43	8.5	0.43	0.0	0.00	-0.37069236
11:31:36	3.94E+00	0:00:09	-0.40	8.9	0.40	0.0	0.00	-0.393296259
11:31:36	3.95E+00	0:00:09	-0.39	9.4	0.39	0.0	0.00	-0.405165644
11:31:37	3.96E+00	0:00:10	-0.39	9.8	0.39	0.0	0.00	-0.413187731
11:31:37	3.96E+00	0:00:10	-0.38	10.3	0.38	0.0	0.00	-0.42136079
11:31:38	3.97E+00	0:00:11	-0.37	10.8	0.37	0.0	0.00	-0.429690615
11:31:38	3.98E+00	0:00:11	-0.36	11.2	0.36	0.0	0.00	-0.442492798
11:31:39	4.00E+00	0:00:12	-0.35	11.7	0.35	0.0	0.00	-0.460296761
11:31:39	4.00E+00	0:00:12	-0.35	12.2	0.35	0.0	0.00	-0.460296761
11:31:40	4.00E+00	0:00:13	-0.35	12.6	0.35	0.0	0.00	-0.460296761
11:31:40	4.00E+00	0:00:13	-0.34	13.1	0.34	0.0	0.00	-0.46941614
11:31:40	4.00E+00	0:00:13	-0.34	13.5	0.34	0.0	0.00	-0.46941614
11:31:41	4.01E+00	0:00:14	-0.33	14.0	0.33	0.0	0.00	-0.478731124
11:31:41	4.01E+00	0:00:15	-0.33	14.5	0.33	0.0	0.00	-0.478731124
11:31:42	4.01E+00	0:00:15	-0.33	14.9	0.33	0.0	0.00	-0.483464626
11:31:42	4.01E+00	0:00:15	-0.33	15.4	0.33	0.0	0.00	-0.483464626
11:31:43	4.01E+00	0:00:16	-0.33	15.8	0.33	0.0	0.00	-0.483464626
11:31:43	4.02E+00	0:00:16	-0.32	16.3	0.32	0.0	0.00	-0.493089274
11:31:44	4.03E+00	0:00:17	-0.31	16.8	0.31	0.0	0.00	-0.503070352
11:31:44	4.02E+00	0:00:17	-0.32	17.2	0.32	0.0	0.00	-0.498119506
11:31:45	4.03E+00	0:00:18	-0.31	17.7	0.31	0.0	0.00	-0.508078287
11:31:45	4.02E+00	0:00:18	-0.32	18.1	0.32	0.0	0.00	-0.493089274
11:31:45	4.03E+00	0:00:19	-0.31	18.6	0.31	0.0	0.00	-0.503070352
11:31:46	4.04E+00	0:00:19	-0.30	19.1	0.30	0.0	0.00	-0.518270803
11:31:46	4.04E+00	0:00:19	-0.30	19.5	0.30	0.0	0.00	-0.518270803
11:31:47	4.04E+00	0:00:20	-0.30	20.0	0.30	0.0	0.00	-0.518270803
11:31:47	4.04E+00	0:00:20	-0.31	20.4	0.31	0.0	0.00	-0.513144645
11:31:48	4.04E+00	0:00:21	-0.30	20.9	0.30	0.0	0.00	-0.523458191
11:31:48	4.04E+00	0:00:22	-0.30	21.5	0.30	0.0	0.00	-0.518270803
11:31:49	4.0425	0:00:22	-0.30	22.4	0.30	0.0	0.00	-0.523458191
11:31:50	4.0497	0:00:23	-0.29	23.4	0.29	0.0	0.00	-0.534022632
11:31:51	4.0497	0:00:24	-0.29	24.4	0.29	0.0	0.00	-0.534022632
11:31:52	4.0497	0:00:25	-0.29	25.4	0.29	0.0	0.00	-0.534022632
11:31:53	4.0569	0:00:26	-0.29	26.4	0.29	0.0	0.00	-0.544850479
11:31:54	4.0569	0:00:27	-0.29	27.4	0.29	0.0	0.00	-0.544850479
11:31:55	4.0569	0:00:28	-0.29	28.4	0.29	0.0	0.00	-0.544850479
11:31:56	4.0605	0:00:29	-0.28	29.4	0.28	0.0	0.00	-0.55036735
11:31:57	4.0714	0:00:30	-0.27	30.4	0.27	0.0	0.00	-0.567511744

Time	MW-14 Slug Out Analog#01 mw14..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
11:31:58	4.06E+00	0:00:31	-0.28	31.4	0.28	0.0	0.00	-0.556111453
11:31:59	4.0642	0:00:32	-0.28	32.4	0.28	0.0	0.00	-0.556111453
11:32:00	4.0678	0:00:33	-0.27	33.4	0.27	0.0	0.00	-0.561774192
11:32:01	4.0714	0:00:34	-0.27	34.4	0.27	0.0	0.00	-0.567511744
11:32:02	4.0605	0:00:35	-0.28	35.4	0.28	0.0	0.00	-0.55036735
11:32:03	4.075	0:00:36	-0.27	36.4	0.27	0.0	0.00	-0.573326112
11:32:04	4.0678	0:00:37	-0.27	37.4	0.27	0.0	0.00	-0.561774192
11:32:05	4.0678	0:00:38	-0.27	38.4	0.27	0.0	0.00	-0.561774192
11:32:06	4.0642	0:00:39	-0.28	39.4	0.28	0.0	0.00	-0.556111453
11:32:07	4.0714	0:00:40	-0.27	40.4	0.27	0.0	0.00	-0.567511744
11:32:08	4.0714	0:00:41	-0.27	41.4	0.27	0.0	0.00	-0.567511744
11:32:09	4.0714	0:00:42	-0.27	42.4	0.27	0.0	0.00	-0.567511744
11:32:10	4.0714	0:00:43	-0.27	43.4	0.27	0.0	0.00	-0.567511744
11:32:11	4.0714	0:00:44	-0.27	44.4	0.27	0.0	0.00	-0.567511744
11:32:12	4.075	0:00:45	-0.27	45.4	0.27	0.0	0.00	-0.573326112
11:32:13	4.0714	0:00:46	-0.27	46.4	0.27	0.0	0.00	-0.567511744
11:32:14	4.0714	0:00:47	-0.27	47.4	0.27	0.0	0.00	-0.567511744
11:32:15	4.0714	0:00:48	-0.27	48.4	0.27	0.0	0.00	-0.567511744
11:32:17	4.0714	0:00:50	-0.27	49.7	0.27	0.0	0.00	-0.567511744
11:32:17	4.0822	0:00:50	-0.26	50.4	0.26	0.0	0.00	-0.58519372
11:32:18	4.08E+00	0:00:51	-0.26	51.4	0.26	0.0	0.00	-0.58519372
11:32:19	4.08E+00	0:00:52	-0.26	52.4	0.26	0.0	0.00	-0.57921938
11:32:20	4.08E+00	0:00:53	-0.26	53.4	0.26	0.0	0.00	-0.58519372
11:32:21	4.08E+00	0:00:54	-0.26	54.4	0.26	0.0	0.00	-0.58519372
11:32:22	4.08E+00	0:00:55	-0.27	55.4	0.27	0.0	0.00	-0.573326112
11:32:23	4.08E+00	0:00:56	-0.26	56.4	0.26	0.0	0.00	-0.57921938
11:32:24	4.08E+00	0:00:57	-0.27	57.4	0.27	0.0	0.00	-0.573326112
11:32:25	4.08E+00	0:00:58	-0.26	58.4	0.26	0.0	0.00	-0.57921938
11:32:26	4.08E+00	0:00:59	-0.27	59.4	0.27	0.0	0.00	-0.573326112
11:32:27	4.08E+00	0:01:00	-0.26	60.4	0.26	0.0	0.00	-0.57921938
11:32:28	4.08E+00	0:01:01	-0.26	61.4	0.26	0.0	0.00	-0.57921938
11:32:29	4.08E+00	0:01:02	-0.26	62.4	0.26	0.0	0.00	-0.57921938
11:32:30	4.08E+00	0:01:03	-0.26	63.4	0.26	0.0	0.00	-0.57921938
11:32:31	4.08E+00	0:01:04	-0.26	64.4	0.26	0.0	0.00	-0.57921938
11:32:32	4.08E+00	0:01:05	-0.26	65.4	0.26	0.0	0.00	-0.58519372
11:32:33	4.09E+00	0:01:06	-0.26	66.4	0.26	0.0	0.00	-0.591251394
11:32:34	4.08E+00	0:01:07	-0.26	67.4	0.26	0.0	0.00	-0.58519372
11:32:35	4.09E+00	0:01:08	-0.26	68.4	0.26	0.0	0.00	-0.591251394
11:32:36	4.09E+00	0:01:09	-0.26	69.4	0.26	0.0	0.00	-0.591251394
11:32:37	4.08E+00	0:01:10	-0.26	70.4	0.26	0.0	0.00	-0.58519372
11:32:38	4.08E+00	0:01:11	-0.26	71.4	0.26	0.0	0.00	-0.57921938
11:32:39	4.09E+00	0:01:12	-0.26	72.4	0.26	0.0	0.00	-0.591251394
11:32:40	4.09E+00	0:01:13	-0.26	73.4	0.26	0.0	0.00	-0.591251394
11:32:41	4.09E+00	0:01:14	-0.26	74.4	0.26	0.0	0.00	-0.591251394
11:32:42	4.09E+00	0:01:15	-0.26	75.4	0.26	0.0	0.00	-0.591251394
11:32:43	4.09E+00	0:01:16	-0.26	76.4	0.26	0.0	0.00	-0.591251394
11:32:44	4.08E+00	0:01:17	-0.26	77.4	0.26	0.0	0.00	-0.58519372
11:32:45	4.09E+00	0:01:18	-0.25	78.4	0.25	0.0	0.00	-0.597394758
11:32:46	4.08E+00	0:01:19	-0.26	79.4	0.26	0.0	0.00	-0.58519372
11:32:47	4.09E+00	0:01:20	-0.26	80.4	0.26	0.0	0.00	-0.591251394
11:32:48	4.09E+00	0:01:21	-0.26	81.5	0.26	0.0	0.00	-0.591251394
11:32:58	4.09E+00	0:01:31	-0.25	91.4	0.25	0.0	0.00	-0.597394758
11:33:08	4.10E+00	0:01:41	-0.25	101.4	0.25	0.0	0.00	-0.609948504
11:33:18	4.09E+00	0:01:51	-0.25	111.4	0.25	0.0	0.00	-0.597394758
11:33:28	4.10E+00	0:02:01	-0.25	121.4	0.25	0.0	0.00	-0.609948504

Time	MW-14 Slug Out Analog#01 mw14..... ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
11:33:38	4.09E+00	0:02:11	-0.25	131.4	0.25	0.0	0.00	-0.603626272
11:33:48	4.10E+00	0:02:21	-0.25	141.4	0.25	0.0	0.00	-0.609948504
11:33:58	4.09E+00	0:02:31	-0.25	151.4	0.25	0.0	0.00	-0.603626272
11:34:08	4.10E+00	0:02:41	-0.25	161.4	0.25	0.0	0.00	-0.609948504
11:34:18	4.10E+00	0:02:51	-0.24	171.4	0.24	0.0	0.00	-0.616543703
11:34:28	4.10E+00	0:03:01	-0.24	181.4	0.24	0.0	0.00	-0.616543703
11:34:38	4.10E+00	0:03:11	-0.24	191.4	0.24	0.0	0.00	-0.616543703
11:34:48	4.10E+00	0:03:21	-0.24	201.4	0.24	0.0	0.00	-0.616543703
11:34:58	4.10E+00	0:03:31	-0.24	211.4	0.24	0.0	0.00	-0.623058243
11:35:08	4.10E+00	0:03:41	-0.24	221.4	0.24	0.0	0.00	-0.616543703
11:35:18	4.10E+00	0:03:51	-0.25	231.4	0.25	0.0	0.00	-0.609948504
11:35:28	4.10E+00	0:04:01	-0.24	241.4	0.24	0.0	0.00	-0.616543703
11:35:38	4.11E+00	0:04:11	-0.23	251.4	0.23	0.0	0.00	-0.629671992
11:35:48	4.11E+00	0:04:21	-0.23	261.4	0.23	0.0	0.00	-0.629671992
11:35:58	4.11E+00	0:04:31	-0.23	271.4	0.23	0.0	0.00	-0.629671992
11:36:08	4.10E+00	0:04:41	-0.24	281.4	0.24	0.0	0.00	-0.623058243
11:36:18	4.11E+00	0:04:51	-0.23	291.4	0.23	0.0	0.00	-0.629671992
11:36:28	4.10E+00	0:05:01	-0.24	301.4	0.24	0.0	0.00	-0.623058243
11:36:38	4.10E+00	0:05:11	-0.24	311.4	0.24	0.0	0.00	-0.623058243
11:36:48	4.11E+00	0:05:21	-0.23	321.4	0.23	0.0	0.00	-0.629671992
11:36:58	4.10E+00	0:05:31	-0.24	331.4	0.24	0.0	0.00	-0.623058243
11:37:08	4.11E+00	0:05:41	-0.23	341.4	0.23	0.0	0.00	-0.629671992

Vernon Co. MW-14Z Slug In



06/16/2003

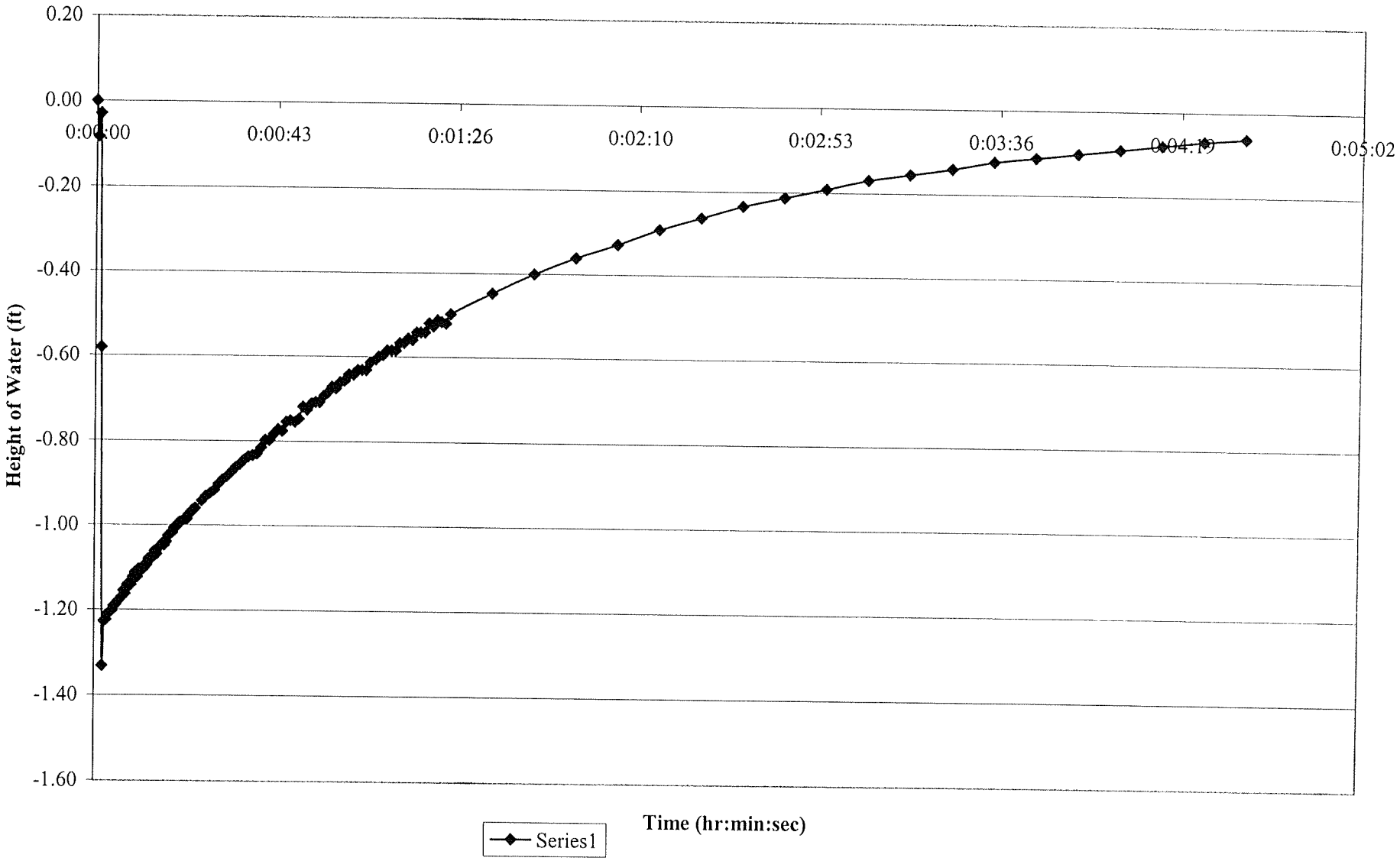
094614ZA.xls MW14Za graph

Time	MW-14Z Slug In Analog#01 mw14Z. ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
11:55:06	6.75E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
11:55:07	7.37E+00	0:00:00	0.62	0.5	0.62	0.5	0.62	-0.204537106
11:55:07	7.99E+00	0:00:01	1.25	0.9	1.25	0.9	1.25	0.096527666
11:55:08	8.23E+00	0:00:01	1.48	1.4	1.48	1.4	1.48	0.171287551
11:55:08	8.62E+00	0:00:02	1.87	1.8	1.87	1.8	1.87	0.271771928
11:55:09	8.67E+00	0:00:02	1.92	2.3	1.92	2.3	1.92	0.283346465
11:55:09	8.48E+00	0:00:03	1.74	2.7	1.74	2.7	1.74	0.239574737
11:55:09	8.21E+00	0:00:03	1.47	3.2	1.47	3.2	1.47	0.165956187
11:55:10	8.20E+00	0:00:04	1.45	3.7	1.45	3.7	1.45	0.162743583
11:55:10	8.19E+00	0:00:04	1.44	4.1	1.44	4.1	1.44	0.159507037
11:55:11	8.18E+00	0:00:05	1.43	4.6	1.43	4.6	1.43	0.156215883
11:55:11	8.17E+00	0:00:05	1.43	5.0	1.43	5.0	1.43	0.15402815
11:55:12	8.16E+00	0:00:05	1.42	5.5	1.42	5.5	1.42	0.15182934
11:55:12	8.16E+00	0:00:06	1.42	5.9	1.42	5.9	1.42	0.15182934
11:55:13	8.15E+00	0:00:06	1.41	6.4	1.41	6.4	1.41	0.148510111
11:55:13	8.15E+00	0:00:07	1.40	6.8	1.40	6.8	1.40	0.146283113
11:55:14	8.14E+00	0:00:07	1.40	7.3	1.40	7.3	1.40	0.145165317
11:55:14	8.14E+00	0:00:08	1.39	7.8	1.39	7.8	1.39	0.142889805
11:55:14	8.13E+00	0:00:08	1.39	8.2	1.39	8.2	1.39	0.14176323
11:55:15	8.12E+00	0:00:09	1.38	8.7	1.38	8.7	1.38	0.138365864
11:55:15	8.11E+00	0:00:09	1.37	9.1	1.37	9.1	1.37	0.136086097
11:55:16	8.11E+00	0:00:10	1.36	9.6	1.36	9.6	1.36	0.133794301
11:55:16	8.10E+00	0:00:10	1.35	10.0	1.35	10.0	1.35	0.13145826
11:55:17	8.09E+00	0:00:10	1.35	10.5	1.35	10.5	1.35	0.129141846
11:55:17	8.09E+00	0:00:11	1.34	11.0	1.34	11.0	1.34	0.12681301
11:55:18	8.08E+00	0:00:11	1.33	11.4	1.33	11.4	1.33	0.124471619
11:55:18	8.08E+00	0:00:12	1.33	11.9	1.33	11.9	1.33	0.124471619
11:55:19	8.07E+00	0:00:12	1.32	12.3	1.32	12.3	1.32	0.122117536
11:55:19	8.06E+00	0:00:13	1.31	12.8	1.31	12.8	1.31	0.118529258
11:55:19	8.06E+00	0:00:13	1.31	13.2	1.31	13.2	1.31	0.117337595
11:55:20	8.05E+00	0:00:14	1.30	13.7	1.30	13.7	1.30	0.114944416
11:55:20	8.05E+00	0:00:14	1.30	14.2	1.30	14.2	1.30	0.114944416
11:55:21	8.04E+00	0:00:15	1.29	14.6	1.29	14.6	1.29	0.111329737
11:55:21	8.03E+00	0:00:15	1.29	15.1	1.29	15.1	1.29	0.110118127
11:55:22	8.03E+00	0:00:16	1.28	15.5	1.28	15.5	1.28	0.10768472
11:55:22	8.02E+00	0:00:16	1.27	16.0	1.27	16.0	1.27	0.105203516
11:55:23	8.02E+00	0:00:16	1.27	16.4	1.27	16.4	1.27	0.103974669
11:55:23	8.01E+00	0:00:17	1.26	16.9	1.26	16.9	1.26	0.100267129
11:55:24	8.00E+00	0:00:17	1.26	17.3	1.26	17.3	1.26	0.099024216
11:55:24	7.99E+00	0:00:18	1.25	17.8	1.25	17.8	1.25	0.096527666
11:55:25	7.99E+00	0:00:18	1.24	18.3	1.24	18.3	1.24	0.093981704
11:55:25	7.98E+00	0:00:19	1.23	18.7	1.23	18.7	1.23	0.091455913
11:55:26	7.98E+00	0:00:19	1.23	19.2	1.23	19.2	1.23	0.091455913
11:55:26	7.97E+00	0:00:20	1.22	19.6	1.22	19.6	1.22	0.087639468
11:55:26	7.97E+00	0:00:20	1.22	20.1	1.22	20.1	1.22	0.086359831
11:55:27	7.96E+00	0:00:20	1.22	20.5	1.22	20.5	1.22	0.085076411
11:55:27	7.96E+00	0:00:21	1.21	21.1	1.21	21.1	1.21	0.082498139
11:55:28	7.94E+00	0:00:22	1.20	22.0	1.20	22.0	1.20	0.078565559
11:55:29	7.93E+00	0:00:23	1.18	23.0	1.18	23.0	1.18	0.071992407
11:55:30	7.9154	0:00:24	1.17	24.0	1.17	24.0	1.17	0.068000226
11:55:31	7.9045	0:00:25	1.16	25.0	1.16	25.0	1.16	0.063933524
11:55:32	7.8937	0:00:26	1.15	26.0	1.15	26.0	1.15	0.05986622
11:55:33	7.8793	0:00:27	1.13	27.0	1.13	27.0	1.13	0.054383208
11:55:34	7.8684	0:00:28	1.12	28.0	1.12	28.0	1.12	0.05018635
11:55:35	7.8576	0:00:29	1.11	29.0	1.11	29.0	1.11	0.045987606

Time	MW-14Z Slug In Analog#01 mw14Z. ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
11:55:36	7.8468	0:00:30	1.10	30.0	1.10	30.0	1.10	0.041747872
11:55:37	7.8323	0:00:31	1.09	31.0	1.09	31.0	1.09	0.035989757
11:55:38	7.8215	0:00:32	1.08	32.0	1.08	32.0	1.08	0.031650794
11:55:39	7.81E+00	0:00:33	1.06	33.0	1.06	33.0	1.06	0.027268042
11:55:40	7.7999	0:00:34	1.05	34.0	1.05	34.0	1.05	0.022840611
11:55:41	7.789	0:00:35	1.04	35.0	1.04	35.0	1.04	0.018325945
11:55:42	7.7782	0:00:36	1.03	36.0	1.03	36.0	1.03	0.013805927
11:55:43	7.7674	0:00:37	1.02	37.0	1.02	37.0	1.02	0.009238371
11:55:44	7.7602	0:00:38	1.01	38.0	1.01	38.0	1.01	0.006166425
11:55:45	7.7493	0:00:39	1.00	39.0	1.00	39.0	1.00	0.001474097
11:55:46	7.7349	0:00:40	0.99	40.0	0.99	40.0	0.99	-0.004803708
11:55:47	7.7241	0:00:41	0.98	41.0	0.98	41.0	0.98	-0.009572342
11:55:49	7.7096	0:00:42	0.96	42.3	0.96	42.3	0.96	-0.016058141
11:55:49	7.706	0:00:43	0.96	43.0	0.96	43.0	0.96	-0.01768353
11:55:50	7.6952	0:00:44	0.95	44.0	0.95	44.0	0.95	-0.022596519
11:55:51	7.6844	0:00:45	0.94	45.0	0.94	45.0	0.94	-0.027565723
11:55:52	7.6735	0:00:46	0.93	46.0	0.93	46.0	0.93	-0.03263926
11:55:53	7.6627	0:00:47	0.92	47.0	0.92	47.0	0.92	-0.037725395
11:55:54	7.6555	0:00:48	0.91	48.0	0.91	48.0	0.91	-0.041149548
11:55:55	7.6519	0:00:49	0.91	49.0	0.91	49.0	0.91	-0.042871802
11:55:56	7.641	0:00:50	0.90	50.0	0.90	50.0	0.90	-0.048128443
11:55:57	7.6302	0:00:51	0.88	51.0	0.88	51.0	0.88	-0.053400375
11:55:58	7.623	0:00:52	0.88	52.0	0.88	52.0	0.88	-0.056950889
11:55:59	7.61E+00	0:00:53	0.87	53.0	0.87	53.0	0.87	-0.062331686
11:56:00	7.61E+00	0:00:54	0.86	54.0	0.86	54.0	0.86	-0.065956281
11:56:01	7.59E+00	0:00:55	0.85	55.0	0.85	55.0	0.85	-0.071501732
11:56:02	7.59E+00	0:00:56	0.84	56.0	0.84	56.0	0.84	-0.075204004
11:56:03	7.58E+00	0:00:57	0.83	57.0	0.83	57.0	0.83	-0.080817271
11:56:04	7.57E+00	0:00:58	0.82	58.0	0.82	58.0	0.82	-0.08650404
11:56:05	7.56E+00	0:00:59	0.81	59.0	0.81	59.0	0.81	-0.09039049
11:56:06	7.55E+00	0:01:00	0.80	60.0	0.80	60.0	0.80	-0.096204857
11:56:07	7.54E+00	0:01:01	0.79	61.0	0.79	61.0	0.79	-0.102098126
11:56:08	7.54E+00	0:01:02	0.79	62.0	0.79	62.0	0.79	-0.102098126
11:56:09	7.53E+00	0:01:03	0.78	63.0	0.78	63.0	0.78	-0.10812817
11:56:10	7.51E+00	0:01:04	0.77	64.0	0.77	64.0	0.77	-0.114186625
11:56:11	7.51E+00	0:01:05	0.76	65.0	0.76	65.0	0.76	-0.118273065
11:56:12	7.50E+00	0:01:06	0.75	66.0	0.75	66.0	0.75	-0.12239832
11:56:13	7.49E+00	0:01:07	0.74	67.0	0.74	67.0	0.74	-0.128660619
11:56:14	7.49E+00	0:01:08	0.74	68.0	0.74	68.0	0.74	-0.130826973
11:56:15	7.48E+00	0:01:09	0.73	69.0	0.73	69.0	0.73	-0.135073808
11:56:16	7.47E+00	0:01:10	0.72	70.0	0.72	70.0	0.72	-0.141522958
11:56:17	7.46E+00	0:01:11	0.71	71.0	0.71	71.0	0.71	-0.145876218
11:56:18	7.45E+00	0:01:12	0.71	72.0	0.71	72.0	0.71	-0.150273556
11:56:19	7.45E+00	0:01:13	0.70	73.0	0.70	73.0	0.70	-0.154777894
11:56:20	7.44E+00	0:01:14	0.69	74.0	0.69	74.0	0.69	-0.159266765
11:56:21	7.43E+00	0:01:15	0.69	75.0	0.69	75.0	0.69	-0.163802519
11:56:22	7.42E+00	0:01:16	0.68	76.0	0.68	76.0	0.68	-0.168386145
11:56:23	7.42E+00	0:01:17	0.67	77.0	0.67	77.0	0.67	-0.173018663
11:56:24	7.41E+00	0:01:18	0.66	78.0	0.66	78.0	0.66	-0.180127178
11:56:25	7.40E+00	0:01:19	0.66	79.0	0.66	79.0	0.66	-0.182500738
11:56:26	7.40E+00	0:01:20	0.65	80.0	0.65	80.0	0.65	-0.187287133
11:56:27	7.39E+00	0:01:21	0.64	81.1	0.64	81.1	0.64	-0.192126868
11:56:37	7.32E+00	0:01:31	0.57	91.0	0.57	91.0	0.57	-0.243896628
11:56:47	7.23E+00	0:01:41	0.48	101.0	0.48	101.0	0.48	-0.318668294
11:56:57	7.15E+00	0:01:51	0.40	111.0	0.40	111.0	0.40	-0.397180658

Time	MW-14Z Slug In Analog#01 mw14Z. ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
11:57:07	7.07E+00	0:02:01	0.33	121.0	0.33	121.0	0.33	-0.483464626
11:57:17	7.02E+00	0:02:11	0.27	131.0	0.27	131.0	0.27	-0.561774192
11:57:27	6.97E+00	0:02:21	0.23	141.0	0.23	141.0	0.23	-0.64320954
11:57:37	6.93E+00	0:02:31	0.19	151.0	0.19	151.0	0.19	-0.726535727
11:57:47	6.90E+00	0:02:41	0.16	161.0	0.16	161.0	0.16	-0.809108283
11:57:57	6.88E+00	0:02:51	0.13	171.0	0.13	171.0	0.13	-0.874193542
11:58:07	6.86E+00	0:03:01	0.12	181.0	0.12	181.0	0.12	-0.937418016
11:58:17	6.84E+00	0:03:11	0.10	191.0	0.10	191.0	0.10	-1.010995384
11:58:27	6.83E+00	0:03:21	0.08	201.0	0.08	201.0	0.08	-1.080921908
11:58:37	6.82E+00	0:03:31	0.08	211.0	0.08	211.0	0.08	-1.120330794
11:58:47	6.81E+00	0:03:41	0.06	221.0	0.06	221.0	0.06	-1.211831629
11:58:57	6.80E+00	0:03:51	0.06	231.0	0.06	231.0	0.06	-1.238072162
11:59:07	6.80E+00	0:04:01	0.05	241.0	0.05	241.0	0.05	-1.295849483
11:59:17	6.79E+00	0:04:11	0.04	251.0	0.04	251.0	0.04	-1.363512104
11:59:27	6.78E+00	0:04:21	0.04	261.0	0.04	261.0	0.04	-1.442492798
11:59:37	6.78E+00	0:04:31	0.04	271.0	0.04	271.0	0.04	-1.442492798
11:59:47	6.78E+00	0:04:41	0.03	281.0	0.03	281.0	0.03	-1.488116639
11:59:57	6.78E+00	0:04:51	0.03	291.0	0.03	291.0	0.03	-1.488116639
12:00:07	6.77E+00	0:05:01	0.03	301.0	0.03	301.0	0.03	-1.539102157
12:00:17	6.77E+00	0:05:11	0.03	311.0	0.03	311.0	0.03	-1.596879479

Vernon Co. MW-14Z Slug Out



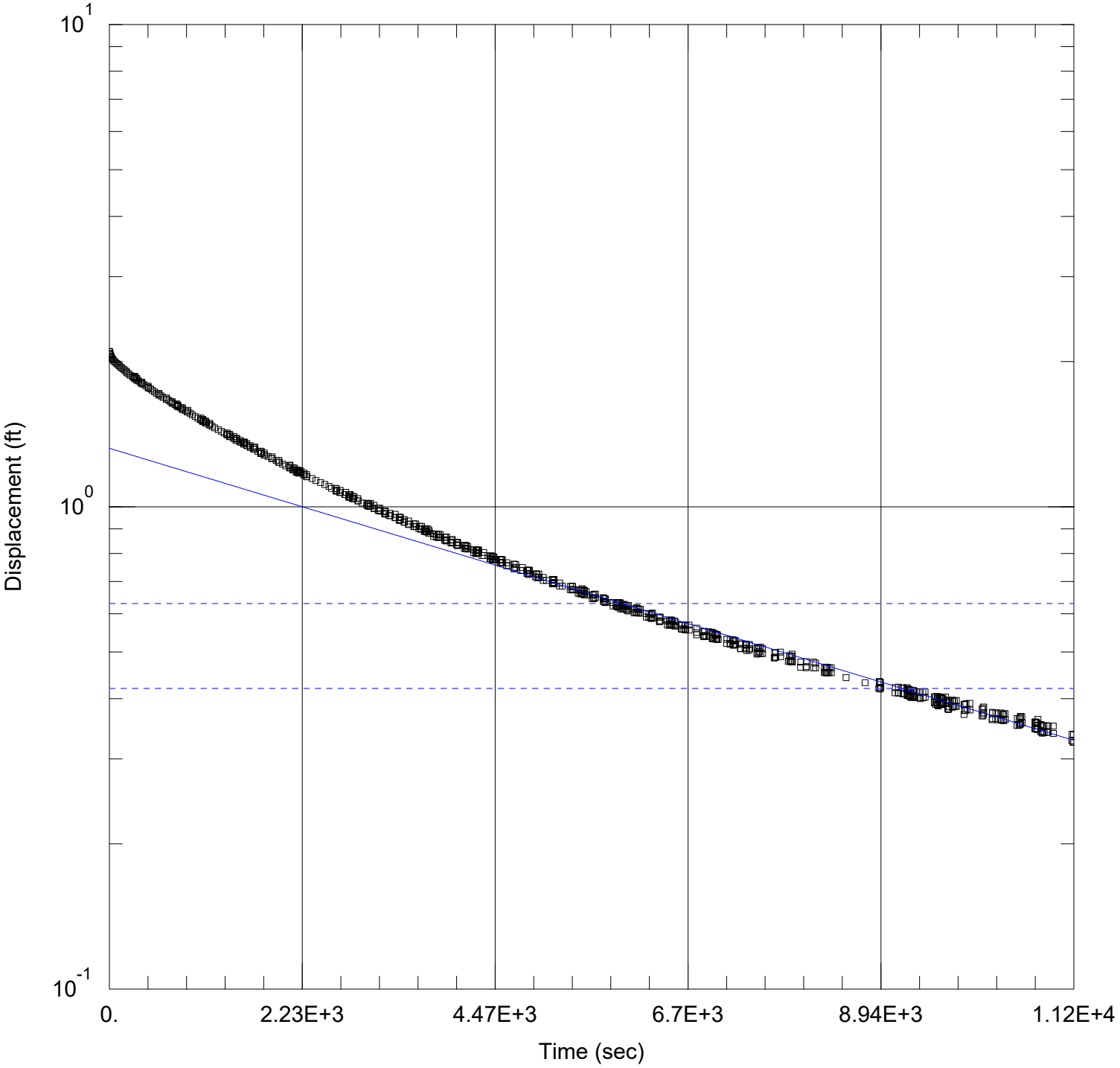
06/16/2003

094614ZB.xls MW14Zb graph

Time	MW-14Z Slug Out Analog#01 mw14Z ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
12:04:44	6.73E+00	0:00:00	0.00	0.0	0.00	0.0	0.00	#NUM!
12:04:44	6.64E+00	0:00:00	-0.08	0.5	0.08	0.0	0.00	-1.080921908
12:04:45	6.70E+00	0:00:01	-0.03	1.0	0.03	0.0	0.00	-1.539102157
12:04:45	6.15E+00	0:00:01	-0.58	1.4	0.58	0.0	0.00	-0.235749125
12:04:46	5.40E+00	0:00:02	-1.33	1.9	1.33	0.0	0.00	0.124471619
12:04:46	5.50E+00	0:00:02	-1.23	2.3	1.23	0.0	0.00	0.088915347
12:04:47	5.50E+00	0:00:03	-1.22	2.8	1.22	0.0	0.00	0.087639468
12:04:47	5.52E+00	0:00:03	-1.21	3.3	1.21	0.0	0.00	0.082498139
12:04:48	5.52E+00	0:00:04	-1.21	3.7	1.21	0.0	0.00	0.081203239
12:04:48	5.53E+00	0:00:04	-1.20	4.2	1.20	0.0	0.00	0.079868335
12:04:49	5.54E+00	0:00:05	-1.19	4.6	1.19	0.0	0.00	0.075948225
12:04:49	5.54E+00	0:00:05	-1.19	5.1	1.19	0.0	0.00	0.074633618
12:04:50	5.55E+00	0:00:06	-1.18	5.6	1.18	0.0	0.00	0.071992407
12:04:50	5.55E+00	0:00:06	-1.18	6.0	1.18	0.0	0.00	0.070665753
12:04:50	5.56E+00	0:00:06	-1.17	6.5	1.17	0.0	0.00	0.068000226
12:04:51	5.57E+00	0:00:07	-1.16	6.9	1.16	0.0	0.00	0.062581984
12:04:51	5.57E+00	0:00:07	-1.16	7.4	1.16	0.0	0.00	0.065280871
12:04:52	5.59E+00	0:00:08	-1.14	7.9	1.14	0.0	0.00	0.057133367
12:04:52	5.58E+00	0:00:08	-1.14	8.3	1.14	0.0	0.00	0.058501943
12:04:53	5.59E+00	0:00:09	-1.14	8.8	1.14	0.0	0.00	0.057133367
12:04:53	5.61E+00	0:00:09	-1.12	9.2	1.12	0.0	0.00	0.05018635
12:04:54	5.62E+00	0:00:10	-1.11	9.7	1.11	0.0	0.00	0.045987606
12:04:54	5.61E+00	0:00:10	-1.12	10.2	1.12	0.0	0.00	0.05018635
12:04:55	5.62E+00	0:00:11	-1.10	10.6	1.10	0.0	0.00	0.04316572
12:04:55	5.62E+00	0:00:11	-1.10	11.1	1.10	0.0	0.00	0.04316572
12:04:56	5.62E+00	0:00:12	-1.10	11.6	1.10	0.0	0.00	0.04316572
12:04:56	5.63E+00	0:00:12	-1.09	12.0	1.09	0.0	0.00	0.038898212
12:04:56	5.63E+00	0:00:12	-1.09	12.5	1.09	0.0	0.00	0.038898212
12:04:57	5.65E+00	0:00:13	-1.08	12.9	1.08	0.0	0.00	0.033101937
12:04:57	5.65E+00	0:00:13	-1.08	13.4	1.08	0.0	0.00	0.033101937
12:04:58	5.65E+00	0:00:14	-1.08	13.9	1.08	0.0	0.00	0.031650794
12:04:58	5.67E+00	0:00:14	-1.06	14.3	1.06	0.0	0.00	0.025797241
12:04:59	5.66E+00	0:00:15	-1.07	14.8	1.07	0.0	0.00	0.028733879
12:04:59	5.67E+00	0:00:15	-1.05	15.2	1.05	0.0	0.00	0.022840611
12:05:00	5.68E+00	0:00:16	-1.05	15.7	1.05	0.0	0.00	0.021354713
12:05:00	5.68E+00	0:00:16	-1.04	16.2	1.04	0.0	0.00	0.018325945
12:05:00	5.68E+00	0:00:17	-1.05	16.6	1.05	0.0	0.00	0.019822224
12:05:01	5.69E+00	0:00:17	-1.04	17.1	1.04	0.0	0.00	0.016824494
12:05:01	5.70E+00	0:00:17	-1.03	17.5	1.03	0.0	0.00	0.010766234
12:05:02	5.7064	0:00:18	-1.02	18.0	1.02	0.0	0.00	0.009238371
12:05:02	5.71	0:00:18	-1.02	18.5	1.02	0.0	0.00	0.007705114
12:05:03	5.7209	0:00:19	-1.01	18.9	1.01	0.0	0.00	0.003029471
12:05:03	5.72E+00	0:00:19	-1.00	19.4	1.00	0.0	0.00	0.001474097
12:05:04	5.7281	0:00:20	-1.00	19.8	1.00	0.0	0.00	-8.68676E-05
12:05:04	5.7353	0:00:20	-0.99	20.3	0.99	0.0	0.00	-0.003225729
12:05:05	5.7425	0:00:21	-0.99	21.4	0.99	0.0	0.00	-0.006387442
12:05:06	5.7425	0:00:22	-0.99	21.9	0.99	0.0	0.00	-0.006387442
12:05:06	5.7533	0:00:22	-0.97	22.3	0.97	0.0	0.00	-0.011173593
12:05:07	5.757	0:00:23	-0.97	22.8	0.97	0.0	0.00	-0.012825499
12:05:07	5.7642	0:00:23	-0.96	23.3	0.96	0.0	0.00	-0.016058141
12:05:08	5.7678	0:00:24	-0.96	23.8	0.96	0.0	0.00	-0.01768353
12:05:09	5.7858	0:00:25	-0.94	25.4	0.94	0.0	0.00	-0.025902996
12:05:10	5.7967	0:00:26	-0.93	26.4	0.93	0.0	0.00	-0.030957033
12:05:11	5.8039	0:00:27	-0.92	27.4	0.92	0.0	0.00	-0.034328029
12:05:12	5.8111	0:00:28	-0.92	28.4	0.92	0.0	0.00	-0.037725395

Time	MW-14Z Slug Out Analog#01 mw14Z ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
12:05:13	5.8255	0:00:29	-0.90	29.4	0.90	0.0	0.00	-0.044600913
12:05:14	5.8364	0:00:30	-0.89	30.4	0.89	0.0	0.00	-0.049878652
12:05:15	5.8436	0:00:31	-0.88	31.4	0.88	0.0	0.00	-0.053400375
12:05:16	5.8544	0:00:32	-0.87	32.4	0.87	0.0	0.00	-0.058737091
12:05:17	5.8652	0:00:33	-0.86	33.4	0.86	0.0	0.00	-0.064140202
12:05:18	5.8725	0:00:34	-0.86	34.4	0.86	0.0	0.00	-0.067830754
12:05:19	5.8833	0:00:35	-0.84	35.4	0.84	0.0	0.00	-0.073348923
12:05:20	5.89E+00	0:00:36	-0.84	36.4	0.84	0.0	0.00	-0.077067043
12:05:21	5.89E+00	0:00:37	-0.83	37.4	0.83	0.0	0.00	-0.078938109
12:05:22	5.90E+00	0:00:38	-0.83	38.4	0.83	0.0	0.00	-0.080817271
12:05:23	5.91E+00	0:00:39	-0.82	39.4	0.82	0.0	0.00	-0.088469538
12:05:24	5.93E+00	0:00:40	-0.80	40.4	0.80	0.0	0.00	-0.098160408
12:05:25	5.93E+00	0:00:41	-0.80	41.4	0.80	0.0	0.00	-0.098160408
12:05:26	5.94E+00	0:00:42	-0.78	42.4	0.78	0.0	0.00	-0.106071873
12:05:27	5.96E+00	0:00:43	-0.77	43.4	0.77	0.0	0.00	-0.112157735
12:05:28	5.95E+00	0:00:44	-0.78	44.4	0.78	0.0	0.00	-0.110138279
12:05:29	5.97E+00	0:00:45	-0.75	45.4	0.75	0.0	0.00	-0.12239832
12:05:30	5.98E+00	0:00:46	-0.75	46.4	0.75	0.0	0.00	-0.124475736
12:05:31	5.97E+00	0:00:47	-0.75	47.4	0.75	0.0	0.00	-0.12239832
12:05:32	5.98E+00	0:00:48	-0.75	48.4	0.75	0.0	0.00	-0.126563137
12:05:33	6.01E+00	0:00:49	-0.72	49.4	0.72	0.0	0.00	-0.143694134
12:05:34	6.00E+00	0:00:50	-0.73	50.4	0.73	0.0	0.00	-0.139362583
12:05:35	6.02E+00	0:00:51	-0.71	51.4	0.71	0.0	0.00	-0.148069321
12:05:36	6.02E+00	0:00:52	-0.71	52.4	0.71	0.0	0.00	-0.150273556
12:05:37	6.02E+00	0:00:53	-0.71	53.4	0.71	0.0	0.00	-0.150273556
12:05:38	6.03E+00	0:00:54	-0.69	54.4	0.69	0.0	0.00	-0.159266765
12:05:39	6.04E+00	0:00:55	-0.69	55.4	0.69	0.0	0.00	-0.163802519
12:05:40	6.06E+00	0:00:56	-0.67	56.4	0.67	0.0	0.00	-0.173018663
12:05:41	6.05E+00	0:00:57	-0.68	57.4	0.68	0.0	0.00	-0.170696227
12:05:42	6.07E+00	0:00:58	-0.66	58.4	0.66	0.0	0.00	-0.180127178
12:05:43	6.07E+00	0:00:59	-0.66	59.4	0.66	0.0	0.00	-0.182500738
12:05:44	6.09E+00	0:01:00	-0.64	60.4	0.64	0.0	0.00	-0.192126868
12:05:45	6.09E+00	0:01:01	-0.64	61.4	0.64	0.0	0.00	-0.192126868
12:05:46	6.10E+00	0:01:02	-0.63	62.4	0.63	0.0	0.00	-0.199489123
12:05:47	6.10E+00	0:01:03	-0.63	63.4	0.63	0.0	0.00	-0.199489123
12:05:48	6.10E+00	0:01:04	-0.63	64.4	0.63	0.0	0.00	-0.199489123
12:05:49	6.11E+00	0:01:05	-0.61	65.4	0.61	0.0	0.00	-0.212114649
12:05:51	6.12E+00	0:01:07	-0.61	66.7	0.61	0.0	0.00	-0.217240807
12:05:51	6.13E+00	0:01:07	-0.60	67.4	0.60	0.0	0.00	-0.222428195
12:05:52	6.13E+00	0:01:08	-0.60	68.4	0.60	0.0	0.00	-0.225045311
12:05:53	6.14E+00	0:01:09	-0.58	69.4	0.58	0.0	0.00	-0.233066906
12:05:54	6.14E+00	0:01:10	-0.58	70.4	0.58	0.0	0.00	-0.233066906
12:05:55	6.14E+00	0:01:11	-0.58	71.4	0.58	0.0	0.00	-0.233066906
12:05:56	6.16E+00	0:01:12	-0.57	72.4	0.57	0.0	0.00	-0.246646787
12:05:57	6.16E+00	0:01:13	-0.57	73.4	0.57	0.0	0.00	-0.246646787
12:05:58	6.17E+00	0:01:14	-0.56	74.4	0.56	0.0	0.00	-0.255003326
12:05:59	6.17E+00	0:01:15	-0.56	75.4	0.56	0.0	0.00	-0.252199909
12:06:00	6.19E+00	0:01:16	-0.54	76.4	0.54	0.0	0.00	-0.266481749
12:06:01	6.19E+00	0:01:17	-0.54	77.4	0.54	0.0	0.00	-0.266481749
12:06:02	6.19E+00	0:01:18	-0.54	78.4	0.54	0.0	0.00	-0.266481749
12:06:03	6.21E+00	0:01:19	-0.52	79.4	0.52	0.0	0.00	-0.284163725
12:06:04	6.20E+00	0:01:20	-0.53	80.4	0.53	0.0	0.00	-0.278189385
12:06:05	6.22E+00	0:01:21	-0.51	81.4	0.51	0.0	0.00	-0.290221398
12:06:06	6.21E+00	0:01:22	-0.52	82.4	0.52	0.0	0.00	-0.287182
12:06:07	6.21E+00	0:01:23	-0.52	83.4	0.52	0.0	0.00	-0.284163725

Time	MW-14Z Slug Out Analog#01 mw14Z ft.....	Change in Time (min:sec)	Change in Wat. Lvl. (ft)	Elapsed Time (sec)	Absolute Change in Wat. Lvl (ft)	Value Elapsed Time (sec)	Value Change in Wat. Lvl (ft)	Log Change in Wat. Lvl (ft)
12:06:08	6.23E+00	0:01:25	-0.50	84.5	0.50	0.0	0.00	-0.302683458
12:06:18	6.28E+00	0:01:34	-0.45	94.4	0.45	0.0	0.00	-0.349109922
12:06:28	6.33E+00	0:01:44	-0.40	104.4	0.40	0.0	0.00	-0.397180658
12:06:38	6.37E+00	0:01:54	-0.36	114.4	0.36	0.0	0.00	-0.442492798
12:06:48	6.40E+00	0:02:04	-0.33	124.4	0.33	0.0	0.00	-0.483464626
12:06:58	6.44E+00	0:02:14	-0.29	134.4	0.29	0.0	0.00	-0.534022632
12:07:08	6.46E+00	0:02:24	-0.26	144.4	0.26	0.0	0.00	-0.57921938
12:07:18	6.49E+00	0:02:34	-0.23	154.4	0.23	0.0	0.00	-0.629671992
12:07:28	6.51E+00	0:02:44	-0.21	164.4	0.21	0.0	0.00	-0.671620397
12:07:38	6.54E+00	0:02:54	-0.19	174.4	0.19	0.0	0.00	-0.71828503
12:07:48	6.56E+00	0:03:04	-0.17	184.4	0.17	0.0	0.00	-0.770318158
12:07:58	6.57E+00	0:03:14	-0.16	194.4	0.16	0.0	0.00	-0.809108283
12:08:08	6.59E+00	0:03:24	-0.14	204.4	0.14	0.0	0.00	-0.851397345
12:08:18	6.61E+00	0:03:34	-0.12	214.4	0.12	0.0	0.00	-0.911155437
12:08:28	6.62E+00	0:03:44	-0.11	224.4	0.11	0.0	0.00	-0.951169913
12:08:38	6.63E+00	0:03:54	-0.10	234.4	0.10	0.0	0.00	-0.995248844
12:08:48	6.64E+00	0:04:04	-0.09	244.4	0.09	0.0	0.00	-1.04431225
12:08:58	6.65E+00	0:04:14	-0.08	254.4	0.08	0.0	0.00	-1.100179498
12:09:08	6.66E+00	0:04:24	-0.07	264.4	0.07	0.0	0.00	-1.163675884
12:09:18	6.67E+00	0:04:34	-0.06	274.4	0.06	0.0	0.00	-1.211831629
12:09:28	6.67E+00	0:04:44	-0.05	284.4	0.05	0.0	0.00	-1.266000713
12:09:38	6.68E+00	0:04:54	-0.04	294.4	0.04	0.0	0.00	-1.363512104
12:09:48	6.68E+00	0:05:04	-0.04	304.4	0.04	0.0	0.00	-1.363512104
12:09:58	6.69E+00	0:05:14	-0.04	314.4	0.04	0.0	0.00	-1.401209493
12:10:08	6.70E+00	0:05:24	-0.03	324.4	0.03	0.0	0.00	-1.488116639
12:10:18	6.70E+00	0:05:34	-0.03	334.4	0.03	0.0	0.00	-1.488116639
12:10:28	6.70E+00	0:05:44	-0.03	344.4	0.03	0.0	0.00	-1.596879479
12:10:38	6.70E+00	0:05:54	-0.03	354.4	0.03	0.0	0.00	-1.596879479
12:10:48	6.71E+00	0:06:04	-0.02	364.4	0.02	0.0	0.00	-1.663540266
12:10:58	6.71E+00	0:06:14	-0.02	374.4	0.02	0.0	0.00	-1.742321425
12:11:08	6.71E+00	0:06:24	-0.01	384.4	0.01	0.0	0.00	-1.838631998
12:11:18	6.72E+00	0:06:34	-0.01	394.4	0.01	0.0	0.00	-1.962573502
12:11:28	6.72E+00	0:06:44	-0.01	404.4	0.01	0.0	0.00	-1.962573502
12:11:38	6.72E+00	0:06:54	-0.01	414.4	0.01	0.0	0.00	-1.962573502
12:11:48	6.72E+00	0:07:04	0.00	424.4	0.00	0.0	0.00	-2.443697499
12:11:58	6.7207	0:07:14	-0.01	434.4	0.01	0.0	0.00	-2.142667504
12:12:08	6.7243	0:07:24	0.00	444.4	0.00	0.0	0.00	-2.443697499
12:12:18	6.7243	0:07:34	0.00	454.4	0.00	0.0	0.00	-2.443697499



MW-17WT RISING HEAD TEST

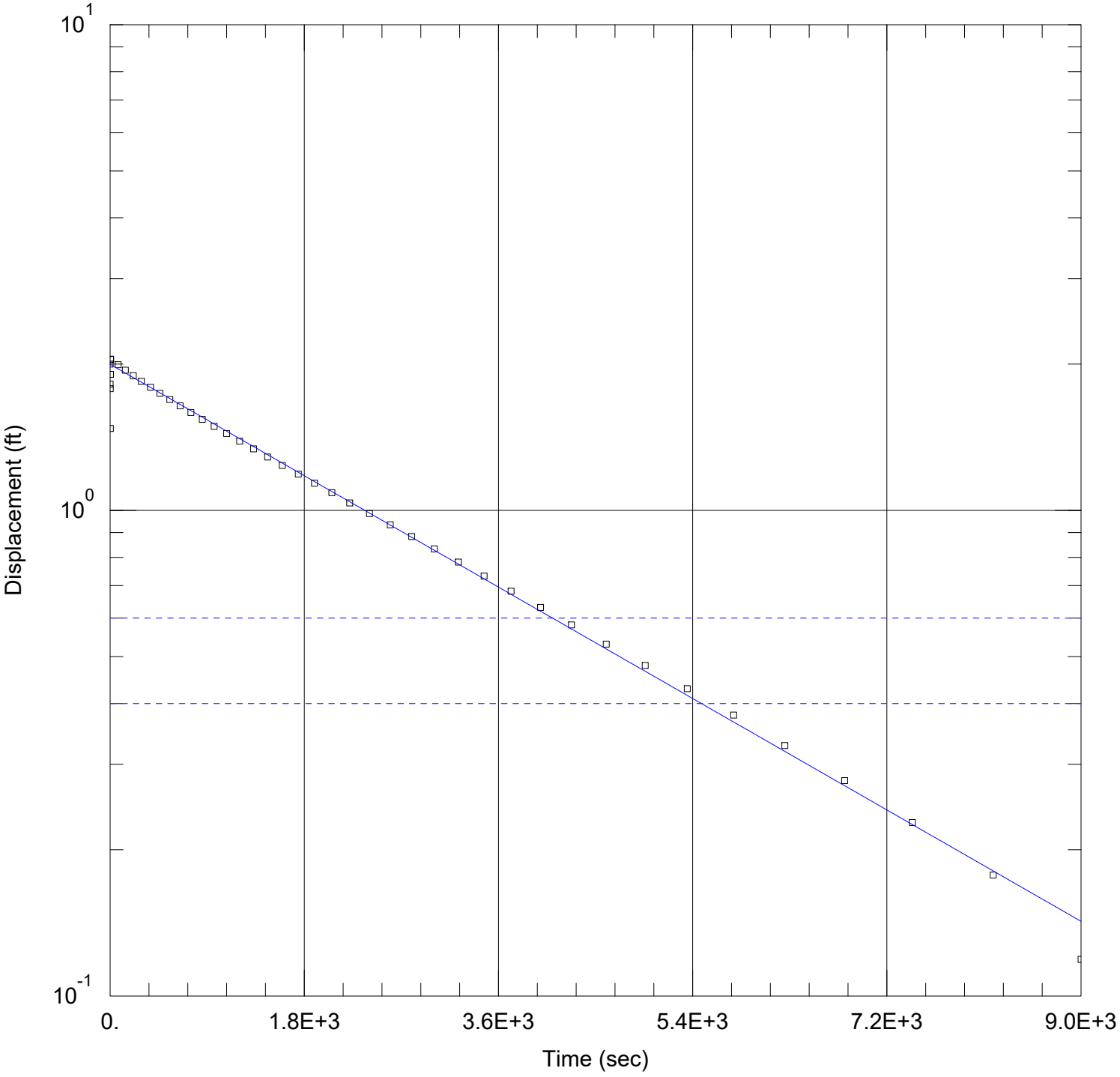
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 1.035E-5 cm/sec

y0 = 1.322 ft



MW-17WT FALLING HEAD TEST

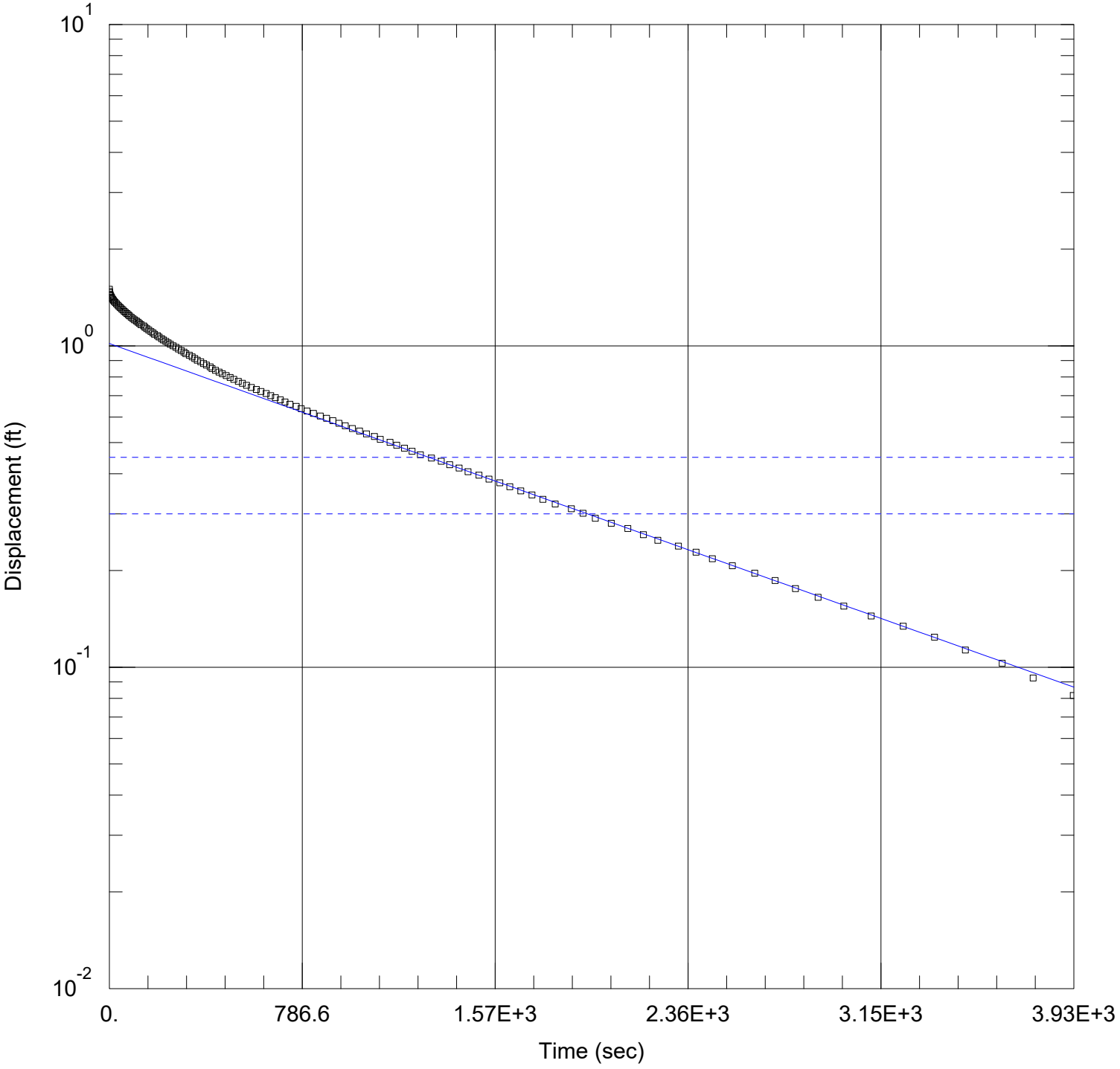
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 2.434E-5 cm/sec

y0 = 1.998 ft



MW-16 RISING HEAD TEST

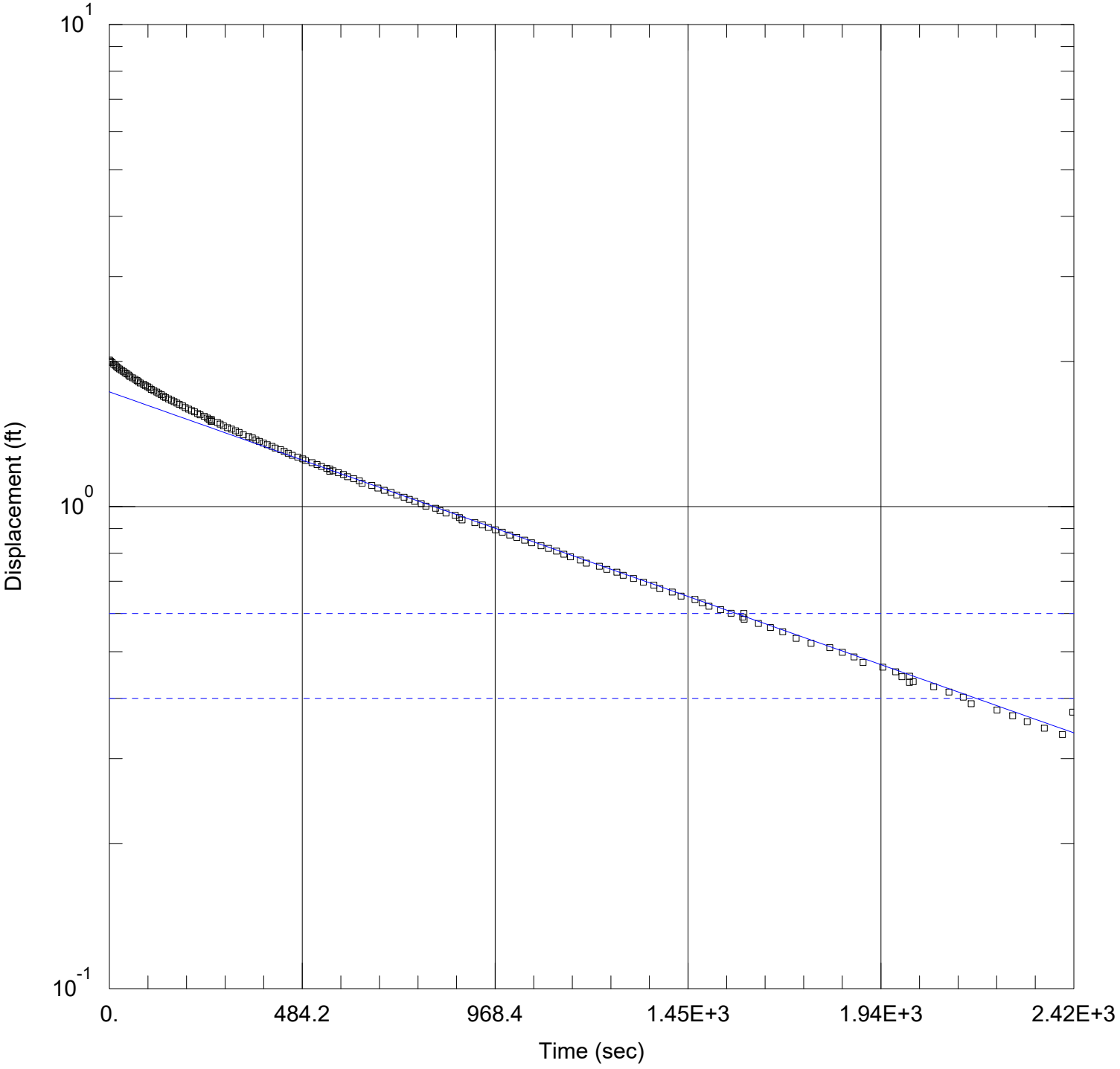
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0003707 cm/sec

y0 = 1.017 ft



MW-16 FALLING HEAD TEST

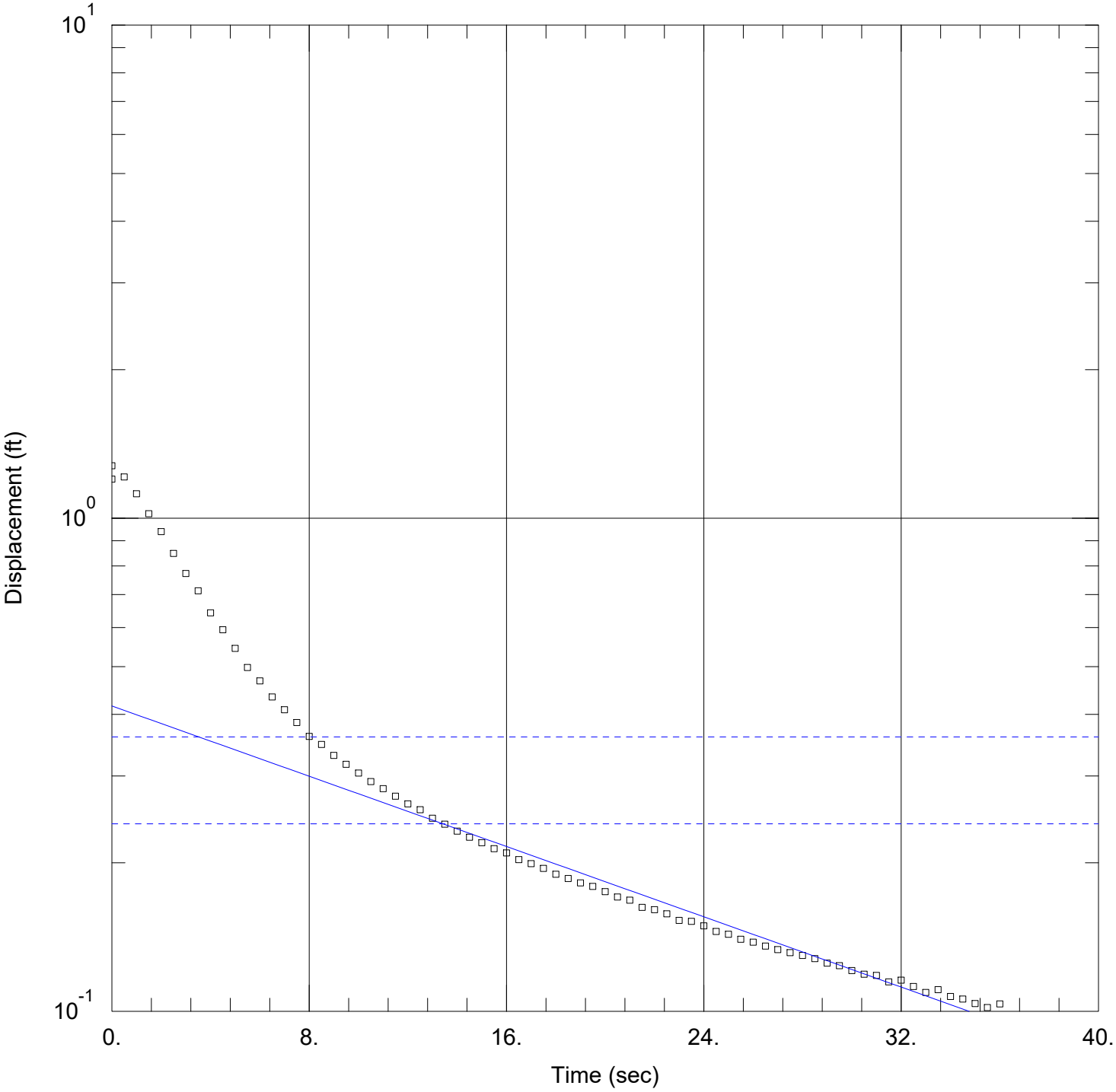
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0003986 cm/sec

y0 = 1.729 ft



MW-14WT RISING HEAD TEST

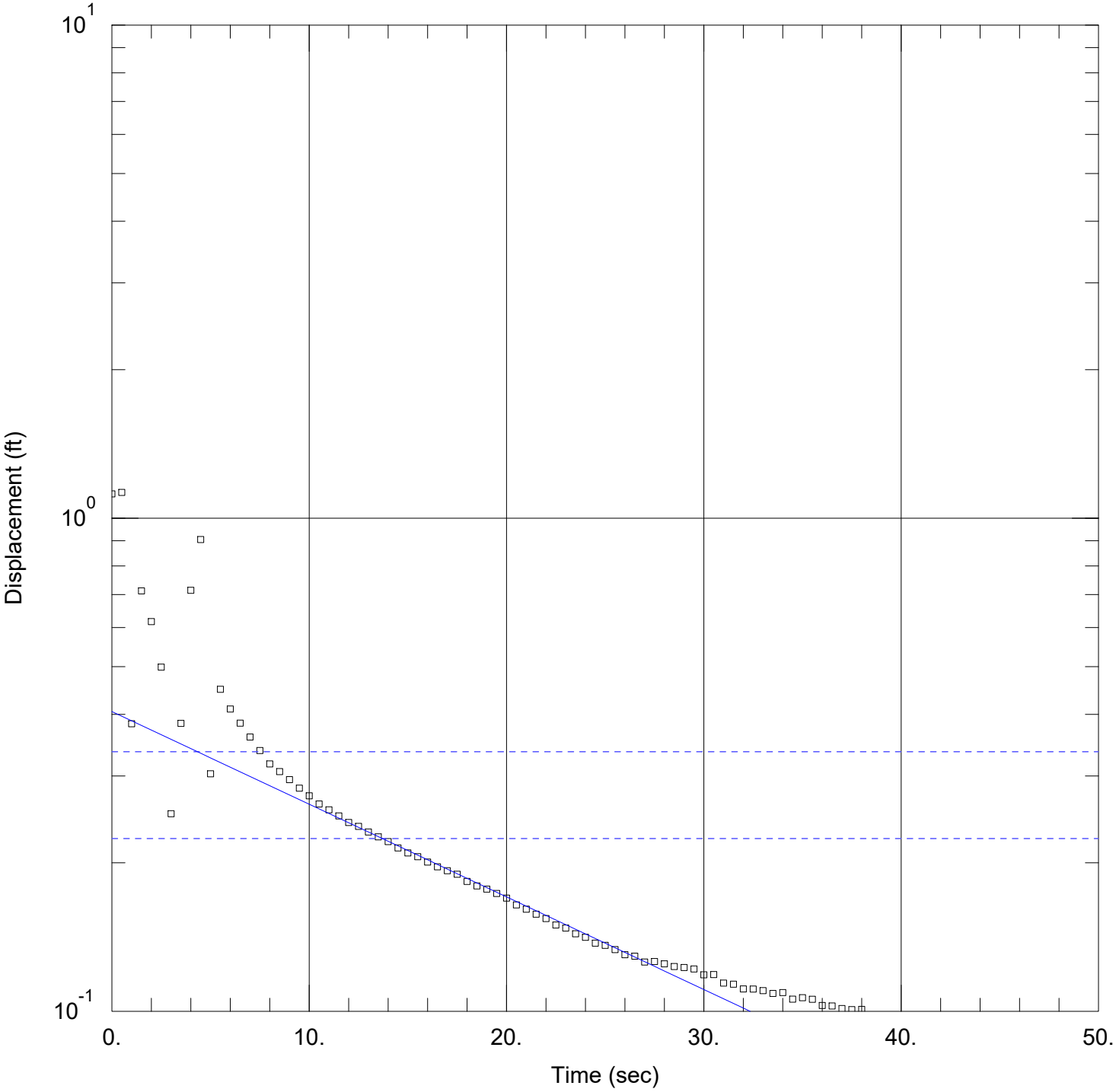
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.00994 cm/sec

y0 = 0.416 ft



MW-14WT FALLING HEAD TEST

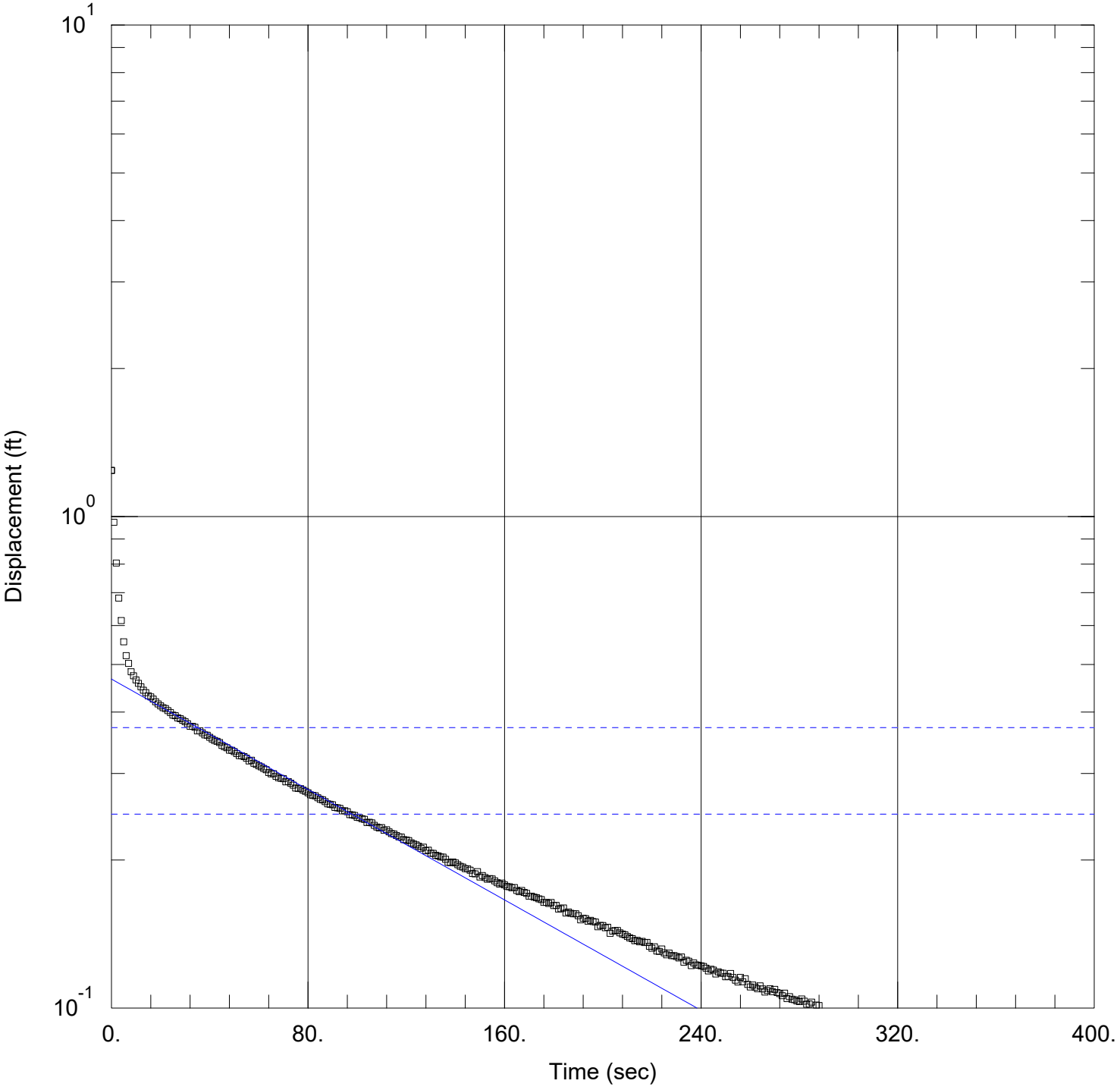
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.007884 cm/sec

y0 = 0.4053 ft



MW12 RISING HEAD TEST

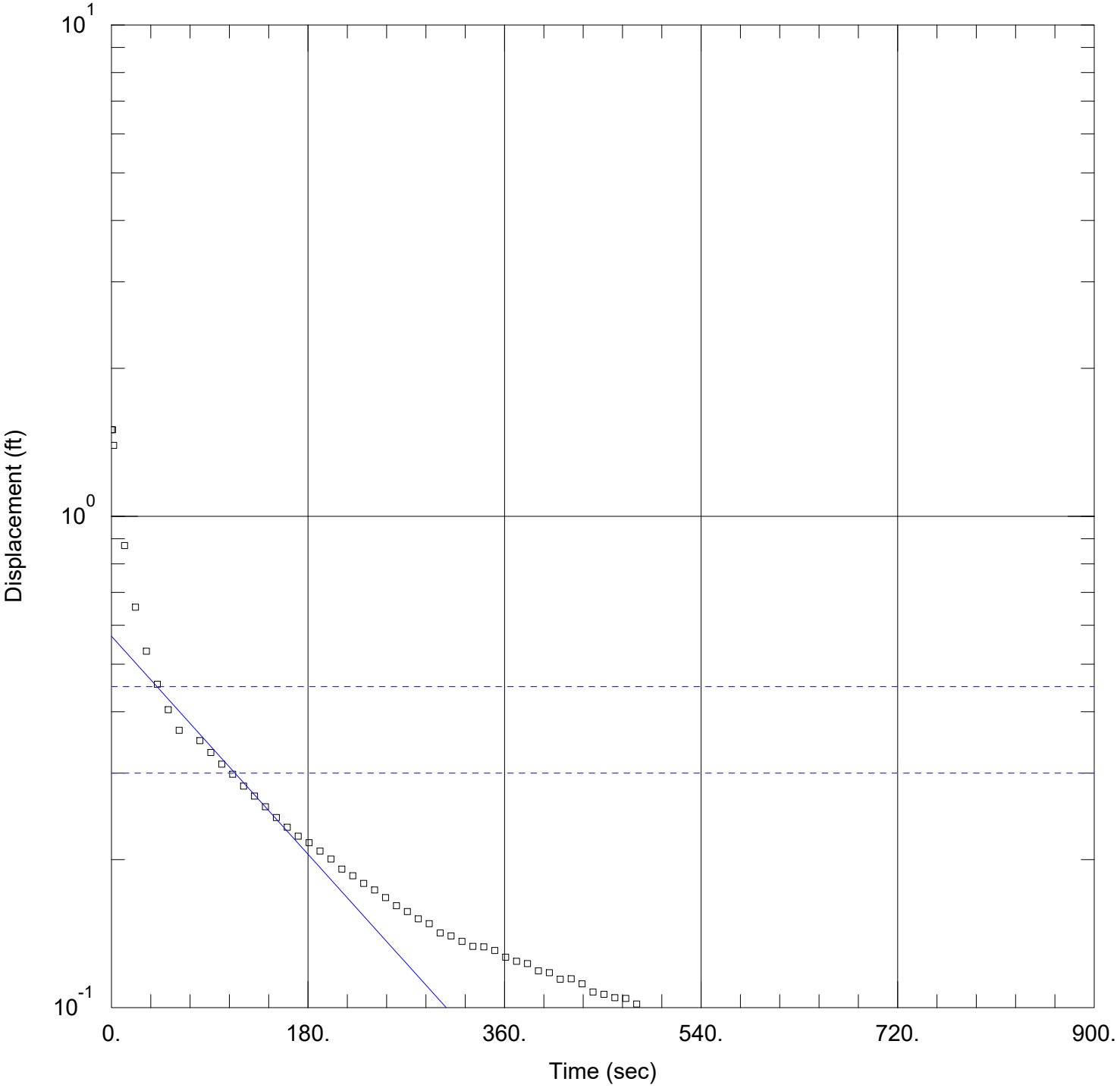
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001178 cm/sec

y0 = 0.4669 ft



MW-12 FALLING HEAD TEST

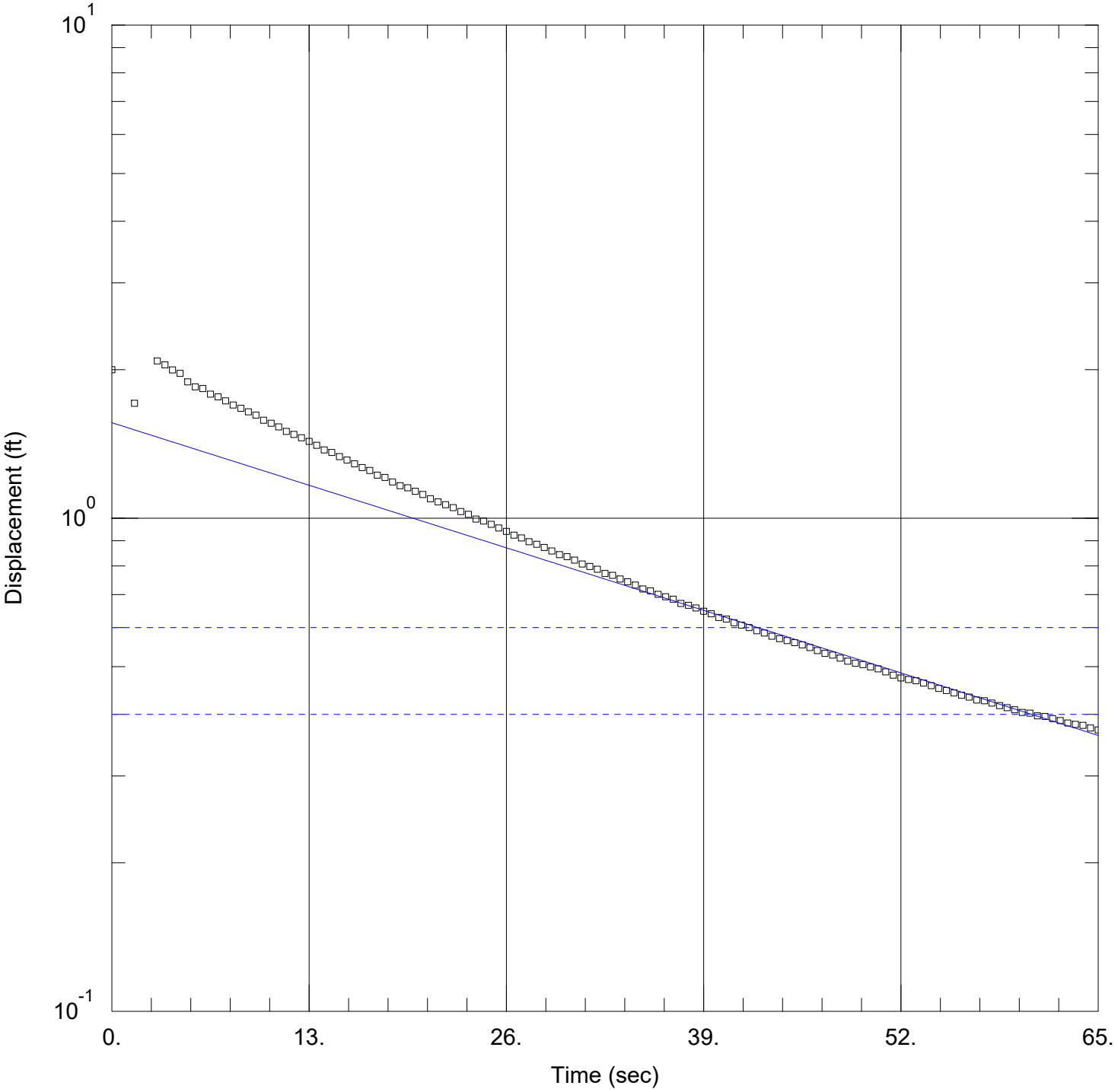
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001035 cm/sec

y0 = 0.5701 ft



MW-2P RISING HEAD TEST

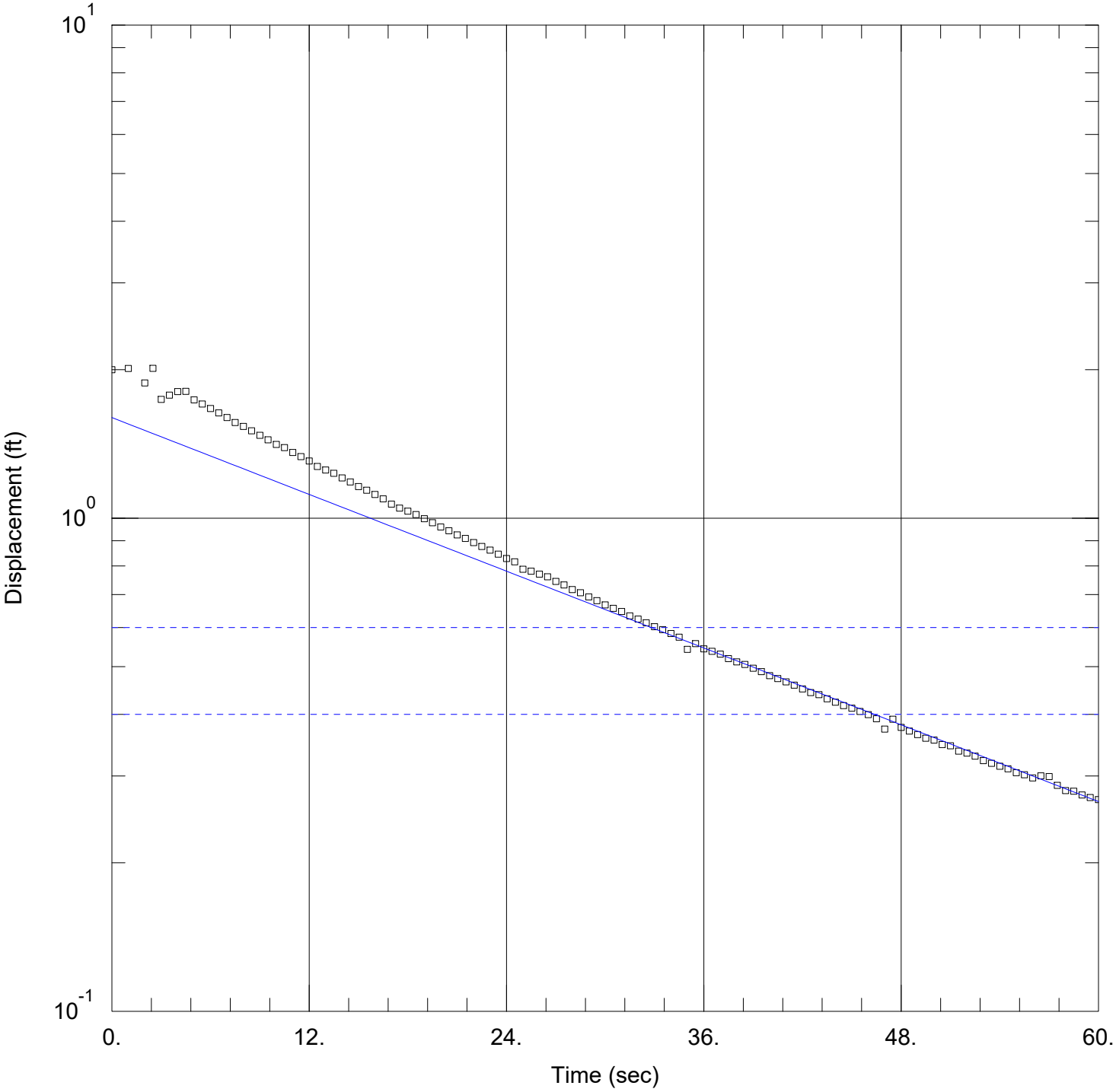
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001638 cm/sec

y0 = 1.562 ft



MW-2P FALLING HEAD TEST

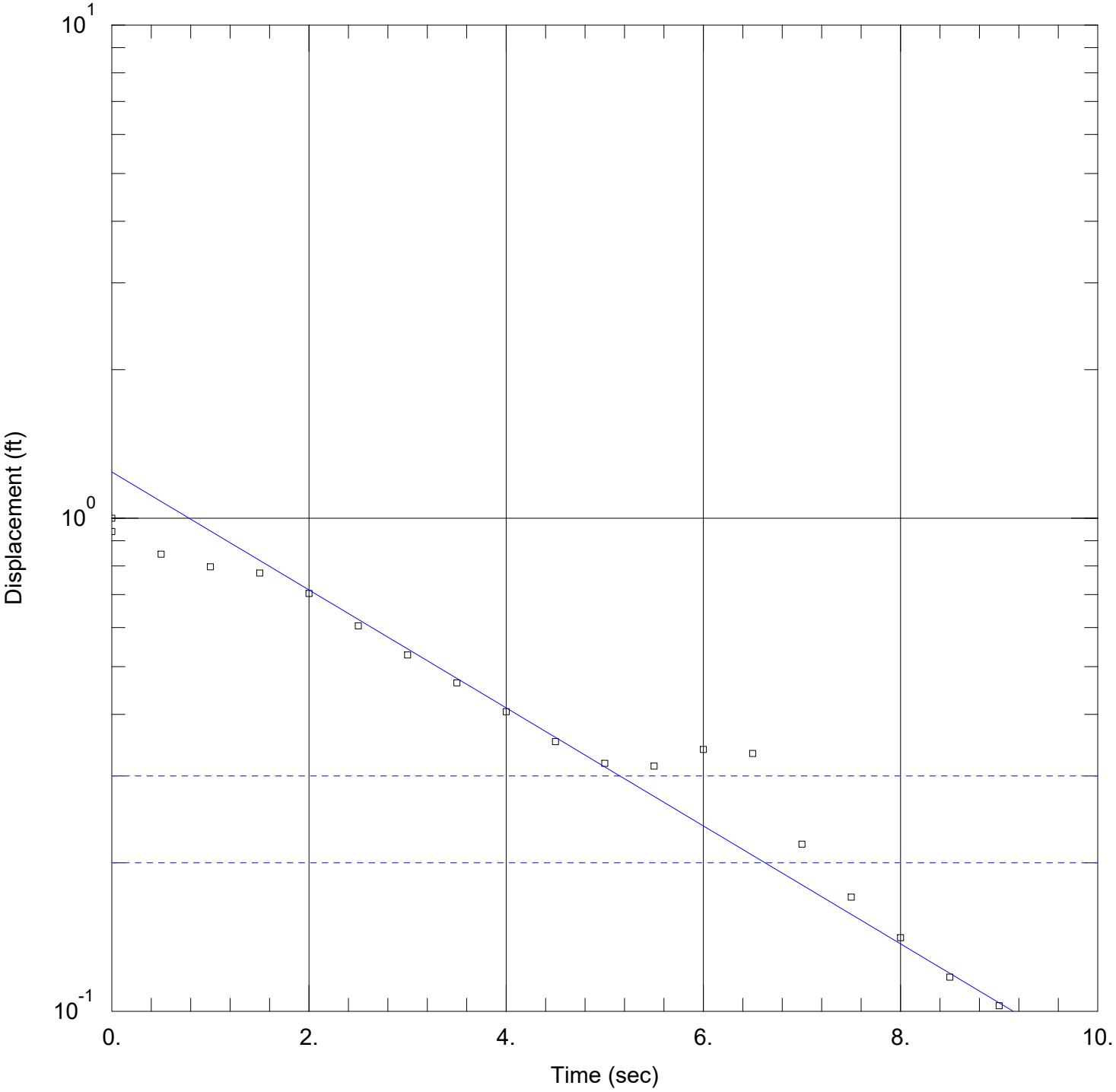
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001491 cm/sec

y0 = 1.599 ft



MW-1R RISING HEAD TEST

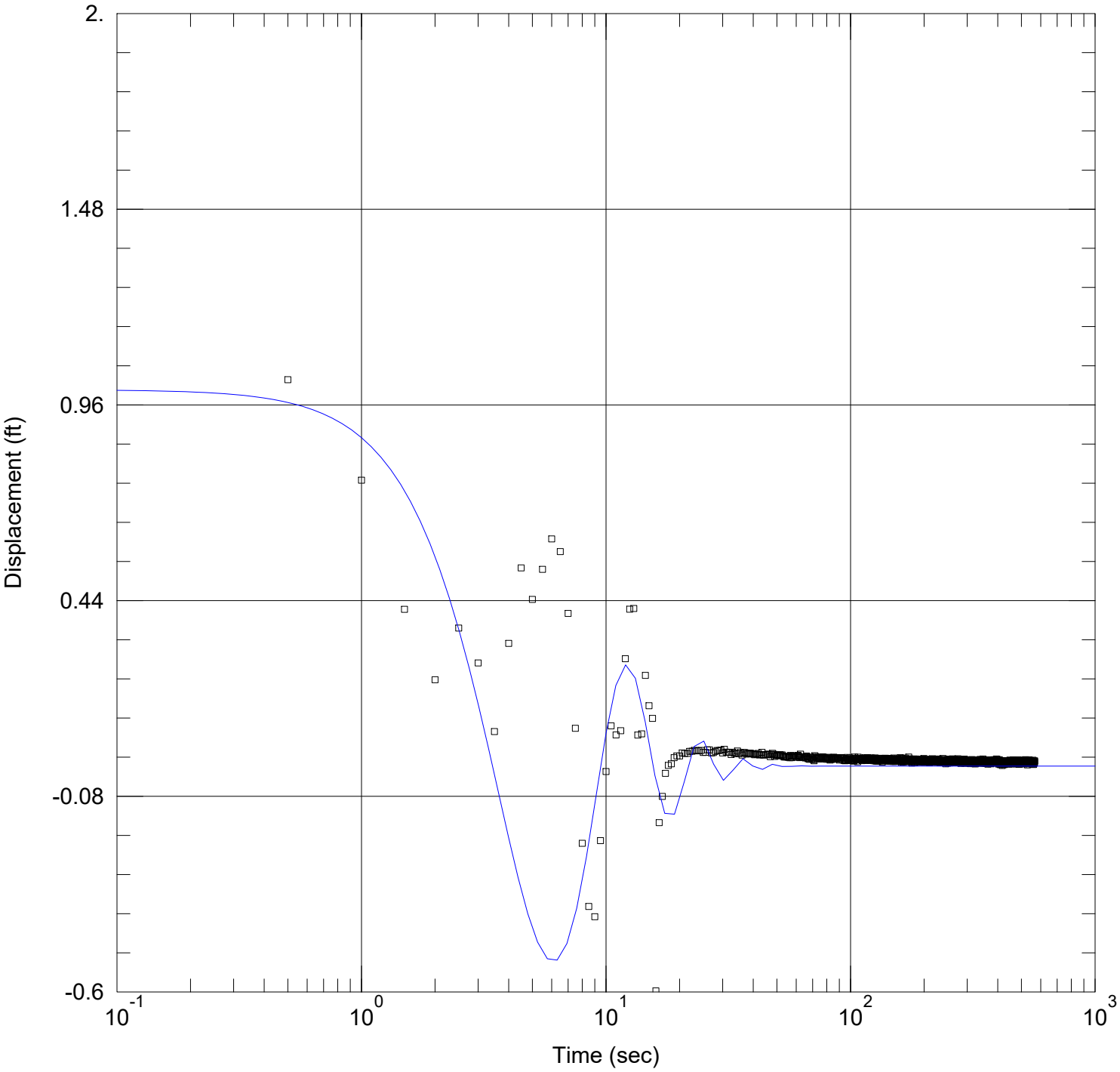
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.06674 cm/sec

y0 = 1.241 ft



MW-1R FALLING HEAD TES

SOLUTION

Aquifer Model: Unconfined

Solution Method: Springer-Gelhar

K = 0.09531 cm/sec

Le = 115.3 ft

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Appendix Q

Historical Water Quality Information

Groundwater Analytical Results
MW-3

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-3															
		PAL	ES	03/25/88	04/25/88	11/09/88	12/21/88	11/30/89	12/27/89	01/29/90	03/05/90	06/13/90	09/19/90	12/12/90	12/28/90	04/01/92	06/10/92	08/18/92	12/30/93
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	--	196	196	204	204	200	192	196	200	172	--	--	--	--	184
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	52	--	<	<	13.9	12.8	29.6	4.0	6.8	20.2	6.7	--	--	--	--	6.2
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	--	--	--	--	3.2	2.7	2.7	2.0	--	--	--	--	--	--	--	1.0
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	10	10	<	<	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	0.18	0.45	1.60	1.45	0.30	--	--	--	0.36	0.06	0.40	--
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	--	208	202	208	228	224	216	208	216	200	--	--	--	--	188
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	<	<	0.08	<	<	0.13	<	0.69	0.08	--	0.13	--	--	<
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	10	<	<	20	<	--	--	--	<	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	<	<	<	<	<	--	--	--	<	--	--	--
NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	0.4	0.8	0.6	0.8	0.8	--	--	--	0.6	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	7	10	10	<	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY	NTU	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1065.54	1065.29	1062.50	1061.61	1059.09	1058.89	1058.46	1057.95	--	--	--	--	--	--	--	1077.60
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	--	--	--	7.64	7.68	7.64	7.72	--	--	--	--	--	--	--	7.36
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	377	--	329	316	321	399	321	383	369	384	343	399	328	343	396	334
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.00

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-3															
		PAL	ES	03/30/94	06/23/94	09/20/94	12/14/94	03/28/95	06/07/95	09/18/95	12/12/95	03/18/96	06/05/96	06/21/96	09/19/96	12/03/96	03/27/97	06/19/97	09/11/97
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.3
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.3
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.3
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.4
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<	--	--	--	<0.1
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<	--	--	--	<0.1
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	<	--	--	--	<	--	--	--	--	0.1	--	--	--	<0.2
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.4
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.2
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	<	--	--	--	<	--	--	--	--	<	--	--	--	<0.1
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	208	212	196	176	196	200	192	--	--	200	200	210	280	220	200	220
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	18.0	<	4.5	14.2	5.0	5.4	7.1	--	--	11.4	11.4	11.1	79.7	11.8	13.0	92.0
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	2.0	2.0	2.0	1.0	2.0	2.0	3.0	--	--	1.0	1.0	2.0	2.9	2.8	7.5	4.0
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	0.21	--	--	0.18	0.18	--	--	--	--	--
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	216.6	220	212	187	181	196	186	--	--	190	190	200	210	200	190	190
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	<	<	0.01	<	<	0.01	0.01	--	--	8	0.008	0.081	0.0076	<0.006	0.01	0.044
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00	--	0.00
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	0.00	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY	NTU	NE	NE	0.79	0.00	--	--	--	--	--	0.00	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1074.00	1073.79	1071.31	1069.78	1235.25	1070.25	1069.50	1068.25	1067.43	1067.28		1068.06	1066.98	1066.00	1065.99	1065.39
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.62	7.24	7.69	7.39	7.28	7.39	7.30	--	--	--	--	7.81	7.28	7.35	7.81	7.01
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	362	307	401	357	376	322	375	--	--	--	--	351	373	345	317	356
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	0.00	--	--	12.00	12.00	--	--	--	--	--	4.80	12.60	12.00	12.00

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Groundwater Analytical Results
MW-3

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-3															
		PAL	ES	12/03/97	03/25/98	06/17/98	09/15/98	12/15/98	03/30/99	06/17/99	09/28/99	12/29/99	03/29/00	09/20/00	03/27/01	09/13/01	03/27/02	09/30/02	03/27/03
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	<0.1	--	--	--	<0.19	--	--	<0.092	--		--		--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	<0.2	--	--	--	<0.3	--	--	<0.13	--	<0.2	--	<0.42	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<0.2	--	--	--	<0.52	--	--	<0.52	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.1	--	--	--	<0.2	--	--	<0.2	--	<0.2	--	<0.5	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	<0.2	--	--	--	<0.15	--	--	<0.1	--	<0.38	--	<0.36	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	<0.2	--	--	--	<0.11	--	--	<0.18	--	<0.38	--	<0.39	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	<0.2	--	--	--	<0.25	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	<0.2	--	--	--	<0.052	--	--	<0.052	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	<0.2	--	--	--	<0.99	--	--	<0.094	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	<0.2	--	--	--	<0.05	--	--	<0.15	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	<0.46	--	--	<0.12	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	<0.3	--	--	--	<0.23	--	--	<0.17	--	<0.15	--	<0.61	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	<0.1	--	--	--	<0.4	--	--	<0.084	--	<0.19	--	<1.1	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.2	--	--	--	<0.35	--	--	<0.35	--	<0.28	--	<0.17	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.2	--	--	--	<0.094	--	--	<0.27	--	<0.35	--	<0.25	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<0.1	--	--	--	<0.35	--	--	<0.11	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	<0.1	--	--	--	<0.26	--	--	<0.26	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	<0.2	--	--	--	<0.78	--	--	<0.2	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.1	--	--	--	<0.19	--	--	<0.19	--	<0.16	--	<0.31	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	--	<0.34	--	--	<0.34	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	--	<0.17	--	--	<0.17	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	<0.1	--	--	--	<0.25	--	--	<0.25	--	<0.2	--	<0.83	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	<0.2	--	--	--	<0.34	--	--	<0.59	--	<0.15	--	<0.57	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	<0.2	--	--	--	<0.04	--	--	<0.18	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	--	<0.35	--	--	<0.15	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	--	<0.28	--	--	<0.13	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.2	--	--	--	<0.23	--	--	<0.23	--	<0.3	--	<0.59	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	<0.2	--	--	--	<0.096	--	--	<0.12	--	<0.17	--	<0.31	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	<0.3	--	--	--	<0.5	--	--	<0.28	--	<0.25	--	<0.44	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	<0.2	--	--	--	<0.18	--	--	<0.18	--	<0.24	--	<0.27	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	<0.2	--	--	--	<0.21	--	--	<0.13	--	<0.15	--	<0.29	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	<0.2	--	--	--	<0.19	--	--	<0.19	--	<0.25	--	<0.23	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.3	--	--	--	<0.096	--	--	<0.096	--	<0.3	--	<0.26	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	<0.1	--	--	--	<0.19	--	--	<0.088	--	<0.22	--	<0.87	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	--	<0.33	--	--	<0.32	--	<0.15	--	<3	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	<0.2	--	--	--	<0.27	--	--	<0.21	--	<0.25	--	<0.46	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.2	--	--	--	<0.25	--	--	<0.12	--	<0.3	--	<0.51	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	--	<0.4	--	--	<0.4	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	<0.1	--	--	--	<0.19	--	--	<0.13	--	<0.5	--	<0.5	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	<0.2	--	--	--	<0.49	--	--	<0.34	--	<0.15	--	<0.7	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.2	--	--	--	<0.074	--	--	<0.21	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	--	<0.23	--	--	<0.12	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	<0.1	--	--	--	<0.49	--	--	<0.11	--	<0.28	--	<0.29	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	<0.1	--	--	--	<0.73	--	--	<0.2	--	<0.3	--	<0.3	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	0.2	--	--	--	<0.082	--	--	<0.082	--	<0.8	--	<0.8	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.2	--	--	--	<0.36	--	--	<0.12	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	--	<0.25	--	--	<0.11	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	<0.1	--	--	--	<0.036	--	--	<0.036	--	<0.36	--	<0.51	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	--	<0.65	--	--	<0.092	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	<0.2	--	--	--	<0.45	--	--	<0.11	--	<0.27	--	<0.3	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	--	<0.12	--	--	<0.13	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<0.2	--	--	--	<0.084	--	--	<0.12	--	<0.18	--	<0.29	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.1	--	--	--	<0.34	--	--	<0.14	--	<0.26	--	<0.32	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	0.3	--	--	--	<0.11	--	--	<0.11	--	<0.4	--	<0.3	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	<0.1	--	--	--	<0.21	--	--	<0.17	--	<0.25	--	<0.39	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	--	<0.14	--	--	<0.14	--	<0.18	--	<0.25	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	<0.4	--	--	--	<0.45	--	--	<0.088	--	<0.17	--	<0.71	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.1	--	--	--	<0.21	--	--	<0.098	--	<0.26	--	<0.36	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<0.2	--	--	--	<0.14	--	--	<0.23	--	<0.39	--	<0.2	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	0.4	--	--	--	<0.39	--	--	<0.30	--	<0.4	--	<0.62	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	0.2	--	--	--	<0.18	--	--	<0.13	--	<0.17	--	<0.3	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	220	200	200	210	200	200	210	200	210	200	200	--	230	210	236	205
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	19.0	45.0	3.9	550.0	<2	11.0	140.0	<2	9.2	11.0	410.0	96.2	37.3	87.0	<10	<10
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	2.7	1.9	<1	<1	<1	1.5	2.5	2.0	2.5	2.0	3.0	<5.0	<1.5	<1.5	4.1	4.9
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	200	200	210	220	200	200	200	200	200	200	200	211	222	237	217	214
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	0.019	<0.006	<18	0.052	0.011	0.011	0.019	0.02	0.0091	0.0072	0.028	0.038	0.018	0.01	0.014	<0.003
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY	NTU	NE	NE	--	--	--	0.00	--	--	--	0.00	0.00	--	0.00	--	--	0.00	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1065.12	1064.97	1065.96	1075.91	1069.90	1068.47	1069.90	1070.19	1069.29	1067.30	1071.80	1069.07	1073.39	1069.92	1067.71	1065.14
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.42	7.77	7.89	7.74	7.75	7.73	7.74	7.22	7.17	6.93	7.96	8.19	6.53	7.51	7.68	7.80
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	348	345	308	369	369	348	352	427	372	335	363	350	351	350	361	377
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	8.30	9.70	14.50	14.60	5.40	12.20	9.90	10.10	8.80	8.20	10.30	7.90	10.20	9.30	12.90	8.40

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Groundwater Analytical Results
MW-3

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-3																
		PAL	ES	06/12/03	09/25/03	03/25/04	09/08/04	03/23/05	09/29/05	03/28/06	09/26/06	03/27/07	09/26/07	03/19/08	09/15/08	03/30/09	09/15/09	03/23/10	09/21/10
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.42	--	<0.42	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.5	--	<0.5
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.5	--	<0.5	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	<0.4
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.36	--	<0.5	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.4	--	<0.4
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.39	--	<0.5	--	<0.15	--	<0.15	--	<0.4	--	<0.4	--	<0.4	--	<0.4
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<0.61	--	<1.3	--	<0.3	--	<0.35	--	<1	--	<1.3	--	<1.3	--	<1.3
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<1.1	--	<1.1	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.3	--	<0.3
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.17	--	<0.4	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.3	--	<0.3
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.25	--	<0.4	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	<0.4
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	<0.62	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--	<6.5
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.31	--	<0.31	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	<0.2
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.83	--	<0.83	--	<0.1	--	<0.1	--	<0.2	--	<0.4	--	<0.4	--	<0.4
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.57	--	<0.8	--	<0.15	--	<0.15	--	<1	--	<1	--	<1	--	<1
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	<0.2	--	<0.2	--	<1	--	<1	--	<1	--	<1
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.59	--	<0.5	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.3	--	<0.3
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.31	--	<0.7	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.2	--	<0.2
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<0.44	--	<1	--	<0.6	--	<0.6	--	<0.6	--	<0.6	--	<0.7	--	<0.7
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.27	--	<0.4	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	<0.2
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.29	--	<0.29	--	0.245	--	0.2	--	0.69	--	<0.4	--	<0.4	--	<0.4
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.23	--	<0.4	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.4	--	<0.4
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.26	--	<0.5	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	<0.2
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.87	--	<0.87	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.4	--	<0.4
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<3	--	<3	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	<0.4
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.46	--	<0.7	--	<0.25	--	<0.25	--	<0.3	--	<0.3	--	<0.3	--	<0.3
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.51	--	<0.5	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.5	--	0.784	--	<0.1	--	0.23	--	<0.1	--	<0.2	--	<0.2	--	<0.2
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	<0.7	--	<1	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.3
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.29	--	<0.5	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	<0.2
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	<2	--	<2	--	<2	--	<2	--	<2	--	<2
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.3	--	<0.3	--	<0.1	--	<0.1	--	<0.2	--	<0.5	--	<0.5	--	<0.5
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.8	--	<0.8	--	<1	--	<1	--	<1	--	<1	--	<1	--	<1
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.51	--	<0.6	--	<0.75	--	<0.75	--	<0.8	--	<0.8	--	<0.8	--	<0.8
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.3	--	<0.6	--	<0.75	--	<0.75	--	<0.8	--	<0.8	--	<0.8	--	<0.8
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.29	--	<0.29	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.1
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.32	--	<0.45	--	<0.1	--	<0.1	--	<0.3	--	<0.3	--	<0.3	--	<0.3
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	<0.7	--	<0.7	--	<1	--	<1	--	<2	--	<2
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.3	--	<0.3	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.39	--	<0.39	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.5	--	<0.5
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.25	--	<0.25	--	<0.1	--	<0.1	--	<0.2	--	<0.4	--	<0.4	--	<0.4
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.71	--	<0.44	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.36	--	<0.5	--	<0.2	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--	<0.4
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.2	--	<0.2	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.62	--	--	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.3	--	<0.3	--	<0.1	--	0.12	--	<0.2	--	<0.2	--	<0.2	--	<0.2
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	213	216	160	214	205	236	256	212	240	230	211	212	216	239	220
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	119.0	12.3	125.0	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	--	4.6	5.0	4.5	3.9	3.6	14.1	3.4	4.1	5.0	3.8	4.2	5.1	4.2	4.2	5.3
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	215	230	217	222	217	279	262	230	228	212	220	216	203	209	223
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	0.025	0.018	--	0.016	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	--	6.93	8.41	11.80	7.49	9.77	7.97	7.65	7.01	6.31	6.28	5.93
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	--	1.00	1.00	1.00
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY	NTU	NE	NE	--	--	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	--	--	1.00	1.00	1.00
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1064.98	1063.31	1061.76	1063.97	1063.44	1061.10	1059.75	1059.32	1059.00	1065.62	1069.83	1080.02	1073.70	1069.87	1067.02	1075.37
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	7.82	--	8.01	7.69	8.03	7.82	--	8.16	--	7.88	7.81	7.91	7.63	8.04	7.73
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	--	414	--	462	560	441	576	--	410	--	356	362	376	299	397	422
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	9.20	--	10.00	8.90	8.30	9.00	--	9.50	--	10.50	12.60	11.80	13.20	12.50	12.50

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Groundwater Analytical Results
MW-3

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date																
				MW-3																
		PAL	ES	03/29/11	09/20/11	04/03/12	09/25/12	04/03/13	09/25/13	04/29/14	09/25/14	03/24/15	09/16/15	03/30/16	09/22/16	03/14/17	09/12/17	03/15/18	09/11/18
VOCs (ug/L)																				
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	<0.24	--	<0.36	--	<0.40	--	<0.60	--	<0.60	--	<0.60
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.9	--	<0.9	--	<0.2	--	<0.2	--	<0.30	--	<0.50	--	<0.50	--	<0.50
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	<0.23	--	<0.23	--	<0.40	--	<0.70	--	<0.70	--	<0.70
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.42	--	<0.42	--	<0.28	--	<0.28	--	<0.30	--	<0.40	--	<0.40	--	<0.40
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.75	--	<0.75	--	<0.19	--	<0.19	--	<0.40	--	<0.30	--	<0.30	--	<0.30
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.57	--	<0.57	--	<0.31	--	<0.31	--	<0.27	--	<0.40	--	<0.40	--	<0.40
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.13	--	<0.14	--	<0.40	--	<0.70	--	<0.70	--	<0.70
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.24	--	<0.13	--	<0.40	--	<0.80	--	<0.80	--	<0.80
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	<0.33	--	<0.24	--	<0.40	--	<0.60	--	<0.60	--	<0.60
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	<0.31	--	<0.31	--	<0.40	--	<0.50	--	<0.50	--	<0.50
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	<0.13	--	<0.18	--	<0.30	--	<0.40	--	<0.40	--	<0.40
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<1.7	--	<1.7	--	<0.87	--	<0.87	--	<0.40	--	<0.70	--	<0.70	--	<0.70
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.56	--	<0.56	--	<0.13	--	<0.068	--	<0.40	--	<0.60	--	<0.60	--	<0.60
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.36	--	<0.36	--	<0.28	--	<0.28	--	<0.30	--	<0.26	--	<0.26	--	<0.26
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.49	--	<0.49	--	<0.2	--	<0.2	--	<0.28	--	<0.40	--	<0.40	--	<0.40
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	<0.2	--	<0.4	--	<0.30	--	<0.40	--	<0.40	--	<0.40
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	<0.14	--	<0.13	--	<0.29	--	<0.50	--	<0.50	--	<0.50
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.14	--	<0.14	--	<0.70	--	<0.50	--	<0.50	--	<0.50
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.1	--	<0.34	--	<9.0	--	<7.0	--	<7.0	--	<7.0
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	<0.15	--	--	--	<7.0	--	<6.0	--	<6.0	--	<6.0
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	<5	--	<5	--	--	--	--	--	<7.0	--	<9.0	--	<9.0	--	<9.0
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.41	--	<0.41	--	<0.074	--	<0.074	--	<0.30	--	<0.24	--	<0.24	--	<0.24
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	<0.40	--	<0.60	--	<0.60	--	<0.60
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.15	--	<0.14	--	<0.40	--	<0.80	--	<0.80	--	<0.80
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.56	--	<0.56	--	<0.17	--	<0.17	--	<0.30	--	<0.40	--	<0.40	--	<0.40
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.91	--	<0.91	--	<0.31	--	<0.31	--	<1.1	--	<0.70	--	<0.70	--	<0.70
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.14	--	<0.17	--	<0.40	--	<0.40	--	<0.40	--	<0.40
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.17	--	<0.45	--	<0.40	--	<0.40	--	<0.40	--	<0.40
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.45	--	<0.25	--	<0.40	--	<0.40	--	<0.40	--	<0.40
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	<0.66	--	<0.66	--	163.5	--	<0.12	--	<0.50	--	<0.50	--	<0.50	--	<0.50
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.49	--	<0.49	--	<0.26	--	<0.26	--	<0.30	--	<0.50	--	<0.50	--	<0.50
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.41	--	<0.41	--	<0.14	--	<0.14	--	<0.40	--	<0.50	--	<0.50	--	<0.50
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<0.97	--	<0.97	--	<0.34	--	<0.34	--	<0.80	--	<0.50	--	<0.50	--	<0.50
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<1.3	--	<1.3	--	<0.2	--	<0.2	--	<0.30	--	<0.30	--	<0.30	--	<0.30
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.24	--	<0.24	--	<0.18	--	<0.18	--	<0.80	--	<0.70	--	<0.70	--	<0.70
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.83	--	<0.83	--	<0.12	--	<0.1	--	<0.30	--	<0.30	--	<0.30	--	<0.30
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.2	--	<0.18	--	<0.18	--	<0.29	--	<0.40	--	<0.40	--	<0.40
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.81	--	<0.81	--	<0.32	--	<0.32	--	<0.40	--	<0.40	--	<0.40	--	<0.40
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.6	--	<0.6	--	<0.36	--	<0.24	--	<0.30	--	<0.80	--	<0.80	--	<0.80
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.99	--	<0.99	--	<0.2	--	<0.2	--	<0.80	--	<0.40	--	<0.40	--	<0.40
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.43	--	<0.43	--	<0.68	--	<0.68	--	<0.30	--	<0.50	--	<0.50	--	<0.50
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	<0.30	--	<0.29	--	<0.29	--	<0.29
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.54	--	<0.54	--	<0.25	--	<0.15	--	<0.30	--	<0.30	--	<0.30	--	<0.30
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	<0.79	--	<0.79	--	<0.19	--	<0.19	--	<0.60	--	<0.30	--	<0.30	--	<0.30
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.26	--	<0.26	--	<0.40	--	<0.90	--	<0.90	--	<0.90
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.18	--	<0.21	--	<0.40	--	<0.40	--	<0.40	--	<0.40
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.87	--	<0.87	--	<0.15	--	<0.15	--	<0.30	--	<0.50	--	<0.50	--	<0.50
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	<4.3	--	<4.3	--	--	--	--	--	<4.0	--	<4.0	--	<4.0	--	<4.0
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.61	--	<0.61	--	<0.068	--	<0.25	--	<0.40	--	<0.30	--	<0.30	--	<0.30
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.89	--	<0.89	--	<0.16	--	<0.16	--	<1.0	--	<0.70	--	<0.70	--	<0.70
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.21	--	<0.2	--	<0.40	--	<0.50	--	<0.50	--	<0.50
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.4	--	<0.13	--	<0.40	--	<0.40	--	<0.40	--	<0.40
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.83	--	<0.83	--	<0.27	--	<0.27	--	<0.40	--	<0.60	--	<0.60	--	<0.60
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.13	--	<0.15	--	<0.40	--	<0.40	--	<0.40	--	<0.40
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.95	--	<0.95	--	<0.15	--	<0.15	--	<0.30	--	<0.60	--	<0.60	--	<0.60
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	<0.25	--	<0.33	--	<0.40	--	<0.50	--	<0.50	--	<0.50
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.86	--	<0.86	--	<0.34	--	<0.32	--	<0.28	--	<0.50	--	<0.50	--	<0.50
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.45	--	<0.45	--	<0.17	--	<0.17	--	<0.40	--	<0.50	--	<0.50	--	<0.50
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	<1.7	--	<1.7	--	--	--	--	--	<1.1	--	<3.0	--	<3.0	--	<3.0
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.67	--	<0.67	--	1.2	--	0.79	--	<0.27	--	<0.30	--	<0.30	--	<0.30
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.89	--	<0.89	--	<0.25	--	<0.25	--	<0.30	--	<0.60	--	<0.60	--	<0.60
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.19	--	<0.19	--	<0.21	--	<0.21	--	<0.30	--	<0.40	--	<0.40	--	<0.40
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.94	--	<0.94	--	<0.28	--	<0.28	--	<0.29	--	<0.70	--	<0.70	--	<0.70
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.48	--	<0.48	--	<0.19	--	<0.19	--	<0.30	--	<0.30	--	<0.30	--	<0.30
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.18	--	<0.18	--	<0.1	--	<0.1	--	<0.18	--	<0.19	--	<0.19	--	<0.19
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<2.6	--	<2.6	--	--	--	--	--	<0.70	--	<0.50	--	<0.50	--	<0.50
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	<0.32	--	<0.13	--	<0.30	--	<0.40	--	<0.40	--	<0.40
INORGANICS																				
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	218	211	218	205	210	200	180	170	200	210	230	230	240	240	250	250
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	4.5	6.7	6.9	7.2	7.5	8.5	7.5	6.8	5.8	5.1	6.0	5.2	5.8	7.8	12.0	11.0
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	220	227	212	224	220	230	230	220	221	230	209	214	204	226	226	243
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	5.16	5.90	6.00	6.30	5.60	5.70	6.40	6.30	7.10	6.10	7.10	8.40	8.60	8.20	5.80	6.70
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																				
COMMENT, SAMPLE COLOR		NE	NE	0.00	0.00	0.00	--	--	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY	NTU	NE	NE	--	0.00	0.00	--	--	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1074.89	1076.74	1070.29	1068.22	1065.09	1071.75	1070.75	1071.61	1067.67	1065.62	1067.67	1072.73	1077.01	1083.01	1077.49	1077.22
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.77	7.69	7.69	7.68	7.23	7.83	7.77	7.74	7.21	7.63	7.80	8.17	7.73	7.86	7.45	6.47
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	376	420	432	441	419	441	433	142	472	404	415	415	419	440	471	472
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	11.50	13.70	12.00	13.80	12.90	11.00	12.20	13.40	10.90	9.90	10.50	10.18	9.24	10.24	11.15	10.24

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-3							
		PAL	ES	03/12/19	09/10/19	03/10/20	09/15/20	03/16/21	09/14/21	03/14/22	9/13/22
VOCs (ug/L)											
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	<0.40	--	<0.40	--	<0.34	--	<0.34
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.29	--	<0.29	--	<0.38	--	<0.38
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.30	--	<0.30	--	<0.36	--	<0.36
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.30	--	<0.30	--	<0.27	--	<0.27
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.30	--	<0.30	--	<0.28	--	<0.28
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.40	--	<0.40	--	<0.49	--	<0.49
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	<0.30	--	<0.30	--	<0.41	--	<0.41
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	<0.23	--	<0.23	--	<0.43	--	<0.43
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	<0.30	--	<0.30	--	<0.35	--	<0.35
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	<0.28	--	<0.28	--	<0.50	--	<0.50
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.29	--	<0.29	--	<0.34	--	<0.34
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<0.25	--	<0.25	--	<0.49	--	<0.49
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.30	--	<0.30	--	<0.33	--	<0.33
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.24	--	<0.24	--	<0.69	--	<0.69
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.18	--	<0.18	--	<0.37	--	<0.37
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.27	--	<0.27	--	<0.30	--	<0.30
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	<0.17	--	<0.17	--	<0.28	--	<0.28
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	<0.30	--	<0.30	--	<0.31	--	<0.31
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<3.0	--	<3.0	--	<3.3	--	<3.3
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	<2.2	--	<2.2	--	<3.7	--	<3.7
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	<4.0	--	<4.0	--	<4.1	--	<4.1
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.40	--	<0.40	--	<0.47	--	<0.47
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.33	--	<0.33
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.30	--	<0.30	--	<0.26	--	<0.26
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.29	--	<0.29	--	<0.76	--	<0.76
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.90	--	<0.90	--	<0.72	--	<0.72
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	<0.29	--	<0.29	--	<0.34	--	<0.34
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.33	--	<0.33
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.27	--	<0.27
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	<0.60	--	<0.60	--	<0.83	--	<0.83
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.30	--	<0.30	--	<0.37	--	<0.37
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.30	--	<0.30	--	<0.37	--	<0.37
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<0.50	--	<0.50	--	<1.1	--	<1.1
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.30	--	<0.30	--	<0.46	--	<0.46
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.60	--	<0.60	--	<1.3	--	<1.3
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.30	--	<0.30	--	<0.41	--	<0.41
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.16	--	<0.16	--	<0.34	--	<0.34
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.30	--	<0.30	--	<0.36	--	<0.36
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.22	--	<0.22	--	<0.45	--	<0.45
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.40	--	<0.40	--	<0.63	--	<0.63
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.40	--	<0.40	--	<1.2	--	<1.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.26	--	<0.26
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.30	--	<0.30	--	<0.42	--	<0.42
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	<0.40	--	<0.40	--	<0.41	--	<0.41
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.57	--	<0.57
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.30	--	<0.30	--	<0.39	--	<0.39
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.26	--	<0.26	--	<0.30	--	<0.30
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	<2.6	--	<2.6	--	<2.9	--	<2.9
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.30	--	<0.30	--	<0.28	--	<0.28
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.30	--	<0.30	--	<0.35	--	<0.35
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.30	--	<0.30	--	<0.34	--	<0.34
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.25	--	<0.25	--	<0.31	--	<0.31
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.30	--	<0.30	--	<0.36	--	<0.36
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.30	--	<0.30	--	<0.31	--	<0.31
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.30	--	<0.30	--	<0.33	--	<0.33
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.30	--	<0.30	--	<0.29	--	<0.29
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.29	--	<0.29	--	<0.33	--	<0.33
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.27	--	<0.27	--	<0.55	--	<0.55
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	<3.0	--	<3.0	--	<3.4	--	<3.4
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.21	--	<0.21	--	<0.27	--	<0.27
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.30	--	<0.30	--	<0.35	--	<0.35
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.23	--	<0.23	--	<0.57	--	<0.57
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.40	--	<0.40	--	<0.50	--	<0.50
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.30	--	<0.30	--	<0.39	--	<0.39
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.14	--	<0.14	--	<0.15	--	<0.15
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.70	--	<0.70	--	<0.74	--	<0.74
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.26	--	<0.26	--	<0.72	--	<0.72
INORGANICS											
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	220	220	220	230	230	210	210	200
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	18.0	19.0	18.0	19.0	19.0	16.0	16.0	19.0
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	257	241	253	259	271	249	290	256
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	6.50	6.70	6.50	6.50	6.20	5.80	5.90	6.10
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--
FIELD PARAMETERS											
COMMENT, SAMPLE COLOR		NE	NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY	NTU	NE	NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1080.80	1082.59	1080.42	1080.22	1076.06	1073.14	1070.69	1069.14
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.59	7.58	7.38	7.53	7.45	6.81	7.28	7.27
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	525	507	513	525	518	510	490	494
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	9.73	10.35	10.00	10.39	9.86	10.18	10.83	10.12

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-4				
		PAL	ES	09/16/15	09/22/16	03/14/17	03/15/18	09/10/19
VOCs (ug/L)								
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	<0.40	<0.60	--	--	<0.40
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.30	<0.50	--	--	<0.29
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	<0.40	<0.70	--	--	<0.30
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.30	<0.40	--	--	<0.30
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.40	<0.30	--	--	<0.30
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.27	<0.40	--	--	<0.40
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	<0.40	<0.70	--	--	<0.30
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	<0.40	<0.80	--	--	<0.23
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	<0.40	<0.60	--	--	<0.30
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	<0.40	<0.50	--	--	<0.28
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<0.30	<0.40	--	--	<0.29
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<0.40	<0.70	--	--	<0.25
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<0.40	<0.60	--	--	<0.30
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.30	<0.26	--	--	<0.24
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.28	<0.40	--	--	<0.18
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<0.30	<0.40	--	--	<0.27
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	<0.29	<0.50	--	--	<0.17
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	<0.70	<0.50	--	--	<0.30
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<9.0	<7.0	--	--	<3.0
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	<7.0	<6.0	--	--	<2.2
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	<7.0	<9.0	--	--	<4.0
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.30	<0.24	--	--	<0.40
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.60	--	--	<0.40
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.80	--	--	<0.30
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.30	<0.40	--	--	<0.29
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<1.1	<0.70	--	--	<0.90
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	<0.40	<0.40	--	--	<0.29
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	<0.40	<0.40	--	--	<0.40
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	<0.40	<0.40	--	--	<0.40
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	<0.50	<0.50	--	--	<0.60
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.30	<0.50	--	--	<0.30
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.40	<0.50	--	--	<0.30
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<0.80	<0.50	--	--	<0.50
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<0.30	<0.30	--	--	<0.30
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.80	<0.70	--	--	<0.60
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.30	<0.30	--	--	<0.30
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.29	<0.40	--	--	<0.16
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.40	<0.40	--	--	<0.30
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.80	--	--	<0.22
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.80	<0.40	--	--	<0.40
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.30	<0.50	--	--	<0.40
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.29	--	--	<0.40
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<0.30	<0.30	--	--	<0.30
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<0.60	<0.30	--	--	<0.40
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.90	--	--	<0.40
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.40	--	--	<0.30
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.30	<0.50	--	--	<0.26
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	<4.0	<4.0	--	--	<2.6
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.40	<0.30	--	--	<0.30
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<1.0	<0.70	--	--	<0.30
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.50	--	--	<0.30
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.40	--	--	<0.25
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.40	<0.60	--	--	<0.30
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.40	--	--	<0.30
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.30	<0.60	--	--	<0.30
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.50	--	--	<0.30
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.28	<0.50	--	--	<0.29
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.40	<0.50	--	--	<0.27
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	<1.1	<3.0	--	--	<3.0
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.27	<0.30	--	--	<0.21
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.30	<0.60	--	--	<0.30
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.40	--	--	<0.23
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.29	<0.70	--	--	<0.40
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.30	<0.30	--	--	<0.30
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.18	<0.19	--	--	<0.14
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.70	<0.50	--	--	<0.70
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.30	<0.40	--	--	<0.26
INORGANICS								
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	280	250	290	360	300
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	2.5	2.5	2.5	2.2	3.2
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	301	230	242	297	286
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	11	17	13	10	12
FIELD PARAMETERS								
COMMENT, SAMPLE COLOR		NE	NE	0.0	0.0	0.0	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	<	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1148.08	1151.22	1151.54	1149.04	1153.37
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.55	8.03	7.29	7.50	7.28
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	513	459	501	573	571
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	9.80	10.11	9.22	10.09	10.06

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-4P															
		PAL	ES	3/25/88	4/25/88	11/9/88	12/21/88	11/30/89	12/27/89	01/29/90	03/05/90	6/13/90	9/19/90	12/12/90	3/13/91	4/1/92	6/10/92	8/18/92	12/30/93
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	--	220	232	256	256	256	240	244	208	184	184	--	--	--	256
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	16.0	--	19.5	12.9	<	3.5	47.3	<	23.0	4.9	<	6.4	--	--	--	15.7
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	--	--	--	--	2.7	0.8	1.3	1.0	--	--	--	--	--	--	--	<
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	10	<	<	20	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	0.33	0.45	1.70	1.80	0.30	--	--	--	0.36	0.18	0.58	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	--	--	236	244	264	276	286	260	248	208	200	204		--	--	260
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	0.03	--	<	<	0.07	<	<	0.01	<	0.07	0.26	<	<	--	--	<
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	3	<	<	<		--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	<	<	<	<	<	--	--	--	<	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	<	<	<	<	<	--	--	--	<	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	0.1	0.2	0.2	0.1	<	--	--	--	0.4	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	6	10	10	<	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00
DEPTH TO TOP OF GRNDWTR (FROM WELL CASING TOP, FT)	ft	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1146.52	1146.11	1145.73	1145.49	1144.21	1143.94	1143.65	1143.14	--	--	--	--	--	--	--	1151.12
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	--	--	--	7.48	7.55	7.59	7.59	--	--	--	--	--	--	--	7.74
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	431	--	371	343	408	491	397	440	511	397	328	343	400	427	496	423.5
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.00

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-4P															
		PAL	ES	3/30/94	6/23/94	9/20/94	12/14/94	3/28/95	6/7/95	9/18/95	12/12/95	3/18/96	6/5/96	9/19/96	12/3/96	3/27/97	6/19/97	9/11/97	12/3/97
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.3	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.3	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.3	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.4	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	<	--	--	--	<0.1	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	<	--	--	--	<0.1	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	<	--	--	--	<	--	--	--	0.2	--	--	--	<0.2	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.4	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	256	212	248	248	248	224	220	240	250	240	230	340	270	250	270	250
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	10.4	6.0	50.2	17.7	7.6	4.1	7.1	<	16.0	11.6	<	6.2	11.8	<5	<2	<2
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	<	3.0	<	1.0	<	<	<	<	<	<	<	1.5	1.8	3.4	2.4	1.7
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	0.28	0.18	0.17	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	256	240	225	229	215	190	210	230	230	260	230	250	250	230	210	240
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	<	0.02	0.05	<	<	<	<	<	0.0061	**0.63**	0.064	<0.006	0.012	0.016	0.0072	<0.006
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	<	0.00	--	0.00	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	<	<	--	0.00	--
COMMENT, SAMPLE TURBIDITY		NE	NE	0.62	--	--	0.00	0.00	0.00	--	--	0.00	0.00	0.00	--	--	--	--	--
DEPTH TO TOP OF GRNDWTR (FROM WELL CASING TOP, FT)	ft	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1149.00	1151.25	1150.40	1149.74	1149.06	1152.02	1150.99	1149.43	1148.68	1148.52	1150.82	1149.60	1148.48	1149.02	1149.49	1149.08
PH, FIELD (STANDARD UNITS)	SU	NE	NE	6.98	7.71	7.72	7.48	7.44	8.70	7.80	8.12	7.47	7.81	7.83	7.04	7.37	7.30	6.91	7.50
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	418	416.28	479.34	409.09	406.45	420.91	428.83	393.79	460.68	422.23	386.62	444	436	403	411	441
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	--	--	--	11.00	11.00	--	--	--	--	3.50	10.90	11.80	10.70	7.20

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-4P															
		PAL	ES	3/25/98	6/17/98	9/15/98	12/15/98	3/30/99	6/17/99	9/28/99	12/29/99	3/29/00	9/20/00	3/27/01	9/13/01	3/27/02	9/30/02	3/27/03	6/12/03
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	<0.1	--	--	--	<0.19	--	--	<0.092	--		--		--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	<0.2	--	--	--	<0.3	--	--	<0.13	--	<0.2	--	<0.42	--	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	<0.2	--	--	--	<0.52	--	--	<0.52	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<0.1	--	--	--	<0.2	--	--	<0.2	--	<0.2	--	<0.5	--	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	<0.2	--	--	--	<0.15	--	--	<0.1	--	<0.38	--	<0.36	--	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	<0.2	--	--	--	<0.11	--	--	<0.18	--	<0.38	--	<0.39	--	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	<0.2	--	--	--	<0.25	--	--	<0.13	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	<0.2	--	--	--	<0.052	--	--	<0.052	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	<0.2	--	--	--	<0.99	--	--	<0.094	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	<0.2	--	--	--	<0.05	--	--	<0.15	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	<0.1	--	--	--	<0.46	--	--	<0.12	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	<0.3	--	--	--	<0.23	--	--	<0.17	--	<0.15	--	<0.61	--	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	<0.1	--	--	--	<0.4	--	--	<0.084	--	<0.19	--	<1.1	--	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<0.2	--	--	--	<0.35	--	--	<0.35	--	<0.28	--	<0.17	--	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	<0.2	--	--	--	<0.094	--	--	<0.27	--	<0.35	--	<0.25	--	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	<0.1	--	--	--	<0.35	--	--	<0.11	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	<0.1	--	--	--	<0.26	--	--	<0.26	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	<0.2	--	--	--	<0.78	--	--	<0.2	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<0.1	--	--	--	<0.19	--	--	<0.19	--	<0.16	--	<0.31	--	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	<0.1	--	--	--	<0.34	--	--	<0.34	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<0.1	--	--	--	<0.17	--	--	<0.17	--	<0.15	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	<0.1	--	--	--	<0.25	--	--	<0.25	--	<0.2	--	<0.83	--	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	<0.2	--	--	--	<0.34	--	--	<0.59	--	<0.15	--	<0.57	--	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	<0.2	--	--	--	<0.04	--	--	<0.18	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	<0.1	--	--	--	<0.35	--	--	<0.15	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	<0.1	--	--	--	<0.28	--	--	<0.13	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<0.2	--	--	--	<0.23	--	--	<0.23	--	<0.3	--	<0.59	--	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	<0.2	--	--	--	<0.096	--	--	<0.12	--	<0.17	--	<0.31	--	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	<0.3	--	--	--	<0.5	--	--	<0.28	--	<0.25	--	<0.44	--	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	<0.2	--	--	--	<0.18	--	--	<0.18	--	<0.24	--	<0.27	--	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	<0.2	--	--	--	<0.21	--	--	<0.13	--	<0.15	--	<0.29	--	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	<0.2	--	--	--	<0.19	--	--	<0.19	--	<0.25	--	<0.23	--	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	<0.3	--	--	--	<0.096	--	--	<0.096	--	<0.3	--	<0.26	--	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	<0.1	--	--	--	<0.19	--	--	<0.088	--	<0.22	--	<0.87	--	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	<0.1	--	--	--	<0.33	--	--	<0.32	--	--	--	<3	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	<0.2	--	--	--	<0.27	--	--	<0.21	--	<0.25	--	<0.46	--	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	<0.2	--	--	--	<0.25	--	--	<0.12	--	<0.3	--	<0.51	--	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<0.1	--	--	--	<0.4	--	--	<0.4	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	<0.1	--	--	--	<0.19	--	--	<0.13	--	<0.5	--	<0.5	--	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	<0.2	--	--	--	<0.49	--	--	<0.34	--	<0.15	--	<0.7	--	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<0.2	--	--	--	<0.074	--	--	<0.21	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<0.1	--	--	--	<0.23	--	--	<0.12	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	<0.1	--	--	--	<0.49	--	--	<0.11	--	<0.28	--	<0.29	--	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	<0.1	--	--	--	<0.73	--	--	<0.2	--	<0.3	--	<0.3	--	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	<0.2	--	--	--	<0.082	--	--	<0.082	--	<0.8	--	<0.8	--	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<0.2	--	--	--	<0.36	--	--	<0.12	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<0.1	--	--	--	<0.25	--	--	<0.11	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	<0.1	--	--	--	<0.036	--	--	<0.036	--	<0.36	--	<0.51	--	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<0.1	--	--	--	<0.65	--	--	<0.092	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	<0.2	--	--	--	<0.45	--	--	<0.11	--	<0.27	--	<0.3	--	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	<0.1	--	--	--	<0.12	--	--	<0.13	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	<0.2	--	--	--	<0.084	--	--	<0.12	--	<0.18	--	<0.29	--	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	<0.1	--	--	--	<0.34	--	--	<0.14	--	<0.26	--	<0.32	--	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	<0.2	--	--	--	<0.11	--	--	<0.11	--	<0.4	--	<0.3	--	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	<0.1	--	--	--	<0.21	--	--	<0.17	--	<0.25	--	<0.39	--	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	<0.1	--	--	--	<0.14	--	--	<0.14	--	<0.18	--	<0.25	--	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	<0.4	--	--	--	<0.45	--	--	<0.088	--	<0.17	--	<0.71	--	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	<0.1	--	--	--	<0.21	--	--	<0.098	--	<0.26	--	<0.36	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	<0.2	--	--	--	<0.14	--	--	<0.23	--	<0.39	--	<0.2	--	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	<0.2	--	--	--	<0.39	--	--	<0.30	--	<0.4	--	<0.62	--	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	<0.1	--	--	--	<0.18	--	--	--	--	<0.17	--	<0.3	--	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	240	210	230	250	250	220	240	250	240	210	271	253	250	269	290	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	9.2	2.5	<2	3.2	<2	5.7	<2	<2	5.8	2.0	27.9	<3	42.0	<3	<3	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	<1	<1		2.5	<1	1.5	1.0	2.0	2.0	<1	<5.0	<1.5	<1.5	2.8	4.1	--
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	260	220	220	230	240	220	240	250	240	220	269	263	297	284	290	--
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	0.028	<18	<0.006	0.0086	<0.006	<0.006	0.047	<0.006	<0.006	0.014	<0.01	0.014	<0.003	**2.56**	<0.003	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	0.00	--	--	--	--	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	--	--
DEPTH TO TOP OF GRNDWTR (FROM WELL CASING TOP, FT)	ft	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1148.95	1150.64	1152.05	1150.14	1148.80	1151.17	1150.43	1149.29	1148.04	1151.66	1148.85	1151.51	1148.73	1149.87	1147.50	1147.42
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.52	7.85		7.52	7.70	7.92	7.42	6.86	6.85	7.73	7.78	5.73	7.28	7.27	7.73	--
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	409	361	417	411	416	400	509	123	412	382	424	426	423	453	483	--
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	9.30	14.00	11.60	7.40	10.90	10.00	9.80	8.80	9.40	9.80	7.40	9.50	9.20	12.50	8.30	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-4P														
		PAL	ES	9/25/03	3/25/04	9/8/04	3/23/05	9/29/05	3/28/06	9/26/06	3/27/07	9/26/07	3/19/08	9/15/08	3/30/09	9/15/09	3/23/10	9/21/10	3/29/11
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70		--		--		--		--		--		--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.42	--	<0.42	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.5	--	<0.5	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.5	--	<0.5	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.36	--	<0.5	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.39	--	<0.5	--	<0.15	--	<0.15	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	<0.3	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<0.61	--	<1.3	--	<0.3	--	<0.35	--	<1	--	<1.3	--	<1.3	--	<1.3	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<1.1	--	<1.1	--	<0.1	--	<0.1	--	<0.2	--	--	--	<0.3	--	<0.3	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.17	--	<0.4	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.3	--	<0.3	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.25	--	<0.4	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.31	--	<0.31	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.83	--	<0.83	--	<0.1	--	<0.1	--	<0.2	--	<0.4	--	<0.4	--	<0.4	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.57	--	<0.8	--	<0.2	--	<0.15	--	<1	--	<1	--	<1	--	<1	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	0.68	--	<0.2	--	<1	--	<1	--	<1	--	<1	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.59	--	<0.5	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.3	--	<0.3	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.31	--	<0.7	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<0.44	--	<1	--	<0.6	--	<0.6	--	<0.6	--	<0.6	--	<0.7	--	<0.7	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<0.27	--	<0.4	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.29	--	<0.29	--	--	--	<0.2	--	0.63	--	<0.4	--	<0.4	--	<0.4	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.23	--	<0.4	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.26	--	<0.5	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.87	--	<0.87	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<3	--	<3	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.46	--	<0.7	--	<0.25	--	<0.25	--	<0.3	--	<0.3	--	<0.3	--	<0.3	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.51	--	<0.5	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<0.5	--	<0.5	--	<0.1	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<0.7	--	<1	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.3	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.15	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.29	--	<0.5	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	<2	--	<2	--	<2	--	<2	--	<2	--	<2	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.3	--	<0.3	--	<0.1	--	<0.1	--	<0.2	--	<0.5	--	<0.5	--	<0.5	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.8	--	<0.8	--	<1	--	<1	--	<1	--	<1	--	<1	--	<1	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.51	--	<0.6	--	<0.75	--	<0.75	--	<0.8	--	<0.8	--	<0.8	--	<0.8	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.3	--	<0.6	--	<0.75	--	<0.75	--	<0.8	--	<0.8	--	<0.8	--	<0.8	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.29	--	<0.29	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.32	--	<0.45	--	<0.1	--	<0.1	--	<0.3	--	<0.3	--	<0.3	--	<0.3	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	<0.7	--	<0.7	--	<1	--	<1	--	<2	--	<2	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.3	--	<0.3	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.39	--	<0.39	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.5	--	<0.5	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.25	--	<0.25	--	<0.1	--	<0.1	--	<0.2	--	<0.4	--	<0.4	--	<0.4	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.71	--	<0.44	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.36	--	<0.5	--	<0.2	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--	<0.4	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.2	--	<0.2	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.62	--	<0.62	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.3	--	<0.3	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	250	293	230	283	294	305	281	276	235	321	305	281	315	312	270	271
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	11.0	--	<	53.8	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	3.3	--	3.1	3.0	2.8	3.1	2.9	3.3	3.3	3.4	4.1	3.7	3.3	2.9	2.9	2.4
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	255	--	223	285	286	309	270	297	224	268	307	293	289	301	269	274
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	3.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	13.7	11.2	10.6	11.6	13.6	13.8	12.0	11.9	11.7	9.9	11.6	10.3
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	--	--	1.00	--	1.00	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	--	--	--	1.00	--	1.00	--
DEPTH TO TOP OF GRNDWTR (FROM WELL CASING TOP, FT)	ft	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1147.35	1146.42	1150.46	1148.37	1147.29	1145.59	1146.99	1145.27	1152.86	1150.51	1152.14	1148.61	1148.01	1147.02	1153.43	1150.50
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.82	--	7.96	7.74	7.98	7.73	--	7.85	--	7.84	7.74	7.91	7.56	7.86	7.78	7.66
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	476	291	490	435	569	595	--	547	--	447	404	458	528	534	498	452
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	8.80	--	9.40	8.30	7.40	8.40	--	9.40	--	9.30	11.60	12.50	14.10	10.90	12.10	10.00

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-4P															
		PAL	ES	9/20/11	4/3/12	9/25/12	4/3/13	9/25/13	4/29/14	9/26/14	3/24/15	9/16/15	3/30/16	9/22/16	3/13/17	9/12/17	3/15/18	9/11/18	3/12/19
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	<0.25	--	<0.25	--	--	--	--	--	<0.60	--	<0.60	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.9	--	<0.9	--	<0.2	--	<0.2	--	--	--	--	--	<0.50	--	<0.50	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	<0.23	--	<0.23	--	--	--	--	--	<0.70	--	<0.70	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.42	--	<0.42	--	<0.28	--	<0.28	--	--	--	--	--	<0.40	--	<0.40	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.75	--	<0.75	--	<0.19	--	<0.19	--	--	--	--	--	<0.30	--	<0.30	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.57	--	<0.57	--	<0.31	--	<0.31	--	--	--	--	--	<0.40	--	<0.40	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.34	--	<0.34	--	--	--	--	--	<0.70	--	<0.70	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	<0.24	--	<0.24	--	--	--	--	--	<0.80	--	<0.80	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	<0.45	--	<0.45	--	--	--	--	--	<0.60	--	<0.60	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	<0.31	--	<0.31	--	--	--	--	--	<0.50	--	<0.50	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	<0.14	--	<0.14	--	--	--	--	--	<0.40	--	<0.40	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<1.7	--	<1.7	--	<0.87	--	<0.87	--	--	--	--	--	<0.70	--	<0.70	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<0.56	--	<0.56	--	<0.36	--	<0.36	--	--	--	--	--	<0.60	--	<0.60	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.36	--	<0.36	--	<0.28	--	<0.28	--	--	--	--	--	<0.26	--	<0.26	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.49	--	<0.49	--	<0.2	--	<0.2	--	--	--	--	--	<0.40	--	<0.40	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	<0.18	--	<0.18	--	--	--	--	--	<0.40	--	<0.40	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	<0.13	--	<0.13	--	--	--	--	--	<0.50	--	<0.50	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.32	--	<0.32	--	--	--	--	--	<0.50	--	<0.50	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<7.0	--	<7.0	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	<6.0	--	<6.0	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	<5	--	<5	--	--	--	--	--	--	--	--	--	<9.0	--	<9.0	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.41	--	<0.41	--	<0.074	--	<0.074	--	--	--	--	--	<0.24	--	<0.24	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.25	--	<0.25	--	--	--	--	--	<0.60	--	<0.60	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.4	--	<0.4	--	--	--	--	--	<0.80	--	<0.80	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.56	--	<0.56	--	<0.17	--	<0.17	--	--	--	--	--	<0.40	--	<0.40	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.91	--	<0.91	--	<0.31	--	<0.31	--	--	--	--	--	<0.70	--	<0.70	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	<0.13	--	<0.13	--	--	--	--	--	<0.40	--	<0.40	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	<0.15	--	<0.15	--	--	--	--	--	<0.40	--	<0.40	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	<0.14	--	<0.14	--	--	--	--	--	<0.40	--	<0.40	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	<0.66	--	<0.66	--	--	--	--	--	--	--	--	--	<0.50	--	<0.50	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.49	--	<0.49	--	<0.26	--	<0.26	--	--	--	--	--	<0.50	--	<0.50	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.41	--	<0.41	--	<0.14	--	<0.14	--	--	--	--	--	<0.50	--	<0.50	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<0.97	--	<0.97	--	<0.34	--	<0.34	--	--	--	--	--	<0.50	--	<0.50	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<1.3	--	<1.3	--	<0.2	--	<0.2	--	--	--	--	--	<0.30	--	<0.30	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.24	--	<0.24	--	<0.18	--	<0.18	--	--	--	--	--	<0.70	--	<0.70	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.83	--	<0.83	--	<0.12	--	<0.12	--	--	--	--	--	<0.30	--	<0.30	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.2	--	<0.2	--	<0.18	--	<0.18	--	--	--	--	--	<0.40	--	<0.40	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.81	--	<0.81	--	<0.32	--	<0.32	--	--	--	--	--	<0.40	--	<0.40	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.6	--	<0.6	--	<0.33	--	<0.33	--	--	--	--	--	<0.80	--	<0.80	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.99	--	<0.99	--	<0.2	--	<0.2	--	--	--	--	--	<0.40	--	<0.40	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.43	--	<0.43	--	<0.68	--	<0.68	--	--	--	--	--	<0.50	--	<0.50	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.15	--	<0.15	--	--	--	--	--	<0.29	--	<0.29	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<0.54	--	<0.54	--	<0.13	--	<0.13	--	--	--	--	--	<0.30	--	<0.30	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<0.79	--	<0.79	--	<0.19	--	<0.19	--	--	--	--	--	<0.30	--	<0.30	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.26	--	<0.26	--	--	--	--	--	<0.90	--	<0.90	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.14	--	<0.14	--	--	--	--	--	<0.40	--	<0.40	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.87	--	<0.87	--	<0.15	--	<0.15	--	--	--	--	--	<0.50	--	<0.50	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	<4.3	--	<4.3	--	--	--	--	--	--	--	--	--	<4.0	--	<4.0	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.61	--	<0.61	--	<0.24	--	<0.24	--	--	--	--	--	<0.30	--	<0.30	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.89	--	<0.89	--	<0.16	--	<0.16	--	--	--	--	--	<0.70	--	<0.70	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.13	--	<0.13	--	--	--	--	--	<0.50	--	<0.50	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.21	--	<0.21	--	--	--	--	--	<0.40	--	<0.40	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.83	--	<0.83	--	<0.27	--	<0.27	--	--	--	--	--	<0.60	--	<0.60	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.2	--	<0.2	--	--	--	--	--	<0.40	--	<0.40	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.95	--	<0.95	--	<0.15	--	<0.15	--	--	--	--	--	<0.60	--	<0.60	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.17	--	<0.17	--	--	--	--	--	<0.50	--	<0.50	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.86	--	<0.86	--	<0.1	--	<0.1	--	--	--	--	--	<0.50	--	<0.50	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.45	--	<0.45	--	<0.17	--	<0.17	--	--	--	--	--	<0.50	--	<0.50	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	<1.7	--	<1.7	--	--	--	--	--	--	--	--	--	<3.0	--	<3.0	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.67	--	<0.67	--	0.9	--	0.54	--	--	--	--	--	<0.30	--	<0.30	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.89	--	<0.89	--	<0.25	--	<0.25	--	--	--	--	--	<0.60	--	<0.60	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.19	--	<0.19	--	<0.21	--	<0.21	--	--	--	--	--	<0.40	--	<0.40	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.94	--	<0.94	--	<0.28	--	<0.28	--	--	--	--	--	<0.70	--	<0.70	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.48	--	<0.48	--	<0.19	--	<0.19	--	--	--	--	--	<0.30	--	<0.30	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.18	--	<0.18	--	<0.1	--	<0.1	--	--	--	--	--	<0.19	--	<0.19	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<2.6	--	<2.6	--	<0.068	--	<0.068	--	--	--	--	--	<0.50	--	<0.50	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	<0.40	--	<0.40	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	299	320	276	290	250	260	150	300	--	280	--	--	330	--	280	300
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	3.3	3.1	3.0	2.8	2.9	3.8	3.4	3.0	--	2.8	--	--	3.1	--	1.9	3.0
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	277	291	275	287	260	300	200	318	--	246	--	--	300	--	244	310
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	11.9	11.8	10.1	9.2	16.0	11.0	19.0	13.0	--	11.0	--	--	13.0	--	9.6	11.0
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	<	<	<	0.00	--	0.00	--	--	0.00	--	0.00	0.00
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	<	--	<		--	<	--	--	<	--	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	<	<	<	0.00	--	0.00	--	--	0.00	--	0.00	0.00
DEPTH TO TOP OF GRNDWTR (FROM WELL CASING TOP, FT)	ft	NE	NE	--	--	--	--	--	--	--	--	150.11	--	141.75	140.86	--	141.81	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1151.26	1148.09	1147.61	1147.06	1151.58	1148.63	1151.11	1147.35	--	1149.36	--	--	1152.88	--	1150.85	1151.66
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.61	7.56	7.58	7.19	7.91	7.84	7.92	7.65	--	7.78	--	--	7.68	--	6.49	7.65
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	551	568	533	525	403	567	370	603	--	480	--	--	566	--	461	562
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	11.20	11.50	12.10	10.80	11.30	9.20	13.00	10.30	--	10.70	--	--	10.47	--	10.31	9.16

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Groundwater Analytical Results
MW-4P

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-4P						
		PAL	ES	9/10/19	3/10/20	9/15/20	3/16/21	9/14/21	3/14/22	9/13/22
VOCs (ug/L)										
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	<0.34	--	<0.34
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	--	<0.38	--	<0.38
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	<0.36	--	<0.36
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.27	--	<0.27
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	--	<0.28	--	<0.28
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	--	<0.49	--	<0.49
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.41	--	<0.41
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	<0.43	--	<0.43
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	<0.35	--	<0.35
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	<0.50	--	<0.50
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	<0.34	--	<0.34
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	--	<0.49	--	<0.49
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	--	<0.33	--	<0.33
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.69	--	<0.69
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.37	--	<0.37
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	<0.30	--	<0.30
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	<0.28	--	<0.28
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.31	--	<0.31
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<3.3	--	<3.3
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	<3.7	--	<3.7
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	<4.1	--	<4.1
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.47	--	<0.47
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.33	--	<0.33
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.26	--	<0.26
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	--	<0.76	--	<0.76
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	--	<0.72	--	<0.72
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	<0.34	--	<0.34
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	<0.33	--	<0.33
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	<0.27	--	<0.27
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	<0.83	--	<0.83
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.37	--	<0.37
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	--	<0.37	--	<0.37
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	--	<1.1	--	<1.1
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	--	<0.46	--	<0.46
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	--	<1.3	--	<1.3
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	--	<0.41	--	<0.41
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.34	--	<0.34
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	--	<0.36	--	<0.36
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.45	--	<0.45
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	<0.63	--	<0.63
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<1.2	--	<1.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.26	--	<0.26
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	--	<0.42	--	<0.42
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	--	<0.41	--	<0.41
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.57	--	<0.57
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.39	--	<0.39
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	--	<0.30	--	<0.30
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	<2.9	--	<2.9
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	--	<0.28	--	<0.28
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	<0.35	--	<0.35
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.34	--	<0.34
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.31	--	<0.31
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	--	<0.36	--	<0.36
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.31	--	<0.31
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	--	<0.33	--	<0.33
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.29	--	<0.29
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	<0.33	--	<0.33
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.55	--	<0.55
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	<3.4	--	<3.4
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	--	<0.27	--	<0.27
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	--	<0.35	--	<0.35
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.57	--	<0.57
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	--	<0.50	--	<0.50
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.39	--	<0.39
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	<0.15	--	<0.15
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	<0.74	--	<0.74
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	<0.72	--	<0.72
INORGANICS										
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	320	--	300	260	300	250
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	--	2.5	--	2.1	2.1	2.1	2.3
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	--	309	--	328	266	357	273
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	11.0	--	11.0	8.2	9.3	9.5
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--
FIELD PARAMETERS										
COMMENT, SAMPLE COLOR		NE	NE	--	0.00	--	0.00	0.00	0.00	0.00
COMMENT, SAMPLE ODOR		NE	NE	--	<	--	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	--	0.00	--	0.00	0.00	0.00	0.00
DEPTH TO TOP OF GRNDWTR (FROM WELL CASING TOP, FT)	ft	NE	NE	138.08	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	--	1150.88	1087.08	1149.32	1149.32	1148.16	1148.92
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	7.35	--	6.84	7.18	7.53	7.26
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	--	576	--	582	508	557	493
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	9.73	--	9.85	10.24	10.56	10.18

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-5															
		PAL	ES	3/25/88	4/25/88	11/9/88	12/21/88	11/29/89	12/27/89	1/29/90	3/5/90	8/18/92	12/30/93	3/30/94	6/23/94	9/20/94	12/14/94	3/28/95	6/7/95
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	15	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.4	4.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	0.48	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	--	--	--	--	--	0.00	0.72	0.00	--	0.00	0.00	0.00
DEPTH TO TOP OF GRNDWTR (FROM WELL CASING TOP, FT)	ft	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1079.66	1079.75	Dry	Dry	Dry	Dry	Dry	Dry	--	1085.80	1084.42	1084.53	1084.24	1083.98	1083.56	1084.18
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	--	--	--	--	--	--	--	--	7.65	7.00	7.66	--	--	--	--
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	404	--	--	--	--	--	--	--	472	364	302	413	407	398	377	447
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-5															
		PAL	ES	9/18/95	10/23/95	12/12/95	3/18/96	6/5/96	9/19/96	3/27/97	6/19/97	9/11/97	12/3/97	3/25/98	6/17/98	9/15/98	12/15/98	3/30/99	6/17/99
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	800	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	800	4000	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	15	75	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.4	4.4	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	212	232	232	--	--	230	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	<	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	57	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	0.13	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	12.6	<	5.9	--	--	4.1	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	<	--	1	--	--	1	--	--	--	--	--	--	--	--	--	--
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	1.3	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	<	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	0.23	0.005	0.17	--	--	0.11	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	210	230	250	--	--	250	--	--	--	--	--	--	--	--	--	--
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	<	--	0.012	--	--	0.01	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	<	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	<	<	3.3	--	--	3.1	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	<	<	--	--	0.03	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	mg/L	2	10	0.2	0.5	0.6	--	--	0.7	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	<	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	<	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	--	--	<	--	--	8.5	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	25	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	0.00	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	<	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	0.00	--	0.00	--	0.00	0.00	--	--	--	--	--	--	--	--	0.00	0.00
DEPTH TO TOP OF GRNDWTR (FROM WELL CASING TOP, FT)	ft	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1084.04	--	1083.61	1079.25	1078.74	1082.12	1076.90	1076.57	1075.72	1076.46	1076.42	1076.71	Dry	1084.24	1083.78	1083.99
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	--	8.09	--	--	7.65	--	--	--	--	--	--	--	6.86	7.71	7.77
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	420	404	371	--	--	389	431	--	--	--	--	--	--	--	410	
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	10.0	--	--	--	--	--	11.5	--	--	--	--	--	--	8.2	12.5	11.6

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-5															
		PAL	ES	9/28/99	9/20/00	3/28/01	9/13/01	10/1/02	9/25/03	9/8/04	3/22/05	9/29/05	3/28/06	9/26/06	3/26/07	9/27/07	3/20/08	9/16/08	9/15/09
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	15	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.4	4.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	0.00	--	0.00	0.00	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	0.00	--	0.00	0.00	--	--	--	--	--	--	--	--	--	--	--
DEPTH TO TOP OF GRNDWTR (FROM WELL CASING TOP, FT)	ft	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	142.43
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1084.21	1083.61	1082.58	1083.98	--	1074.93	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	--
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.00	7.21	--	6.32	7.36	--	--	--	--	--	--	--	--	--	--	--
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	500	414	--	424	456	--	--	--	--	--	--	--	--	--	--	--
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	12.7	10.2	--	11.1	13.1	--	--	--	--	--	--	--	--	--	--	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-5																	
		PAL	ES	3/30/10	9/21/10	3/29/11	9/20/11	4/3/12	9/25/12	4/3/13	3/25/15	3/30/16	9/12/17	9/11/18	3/12/19	3/10/20	3/16/21	9/14/21	3/14/22	9/13/22
VOCs (ug/L)																				
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	15	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.4	4.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
INORGANICS																				
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[(1)]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[(1)]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																				
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DEPTH TO TOP OF GRNDWTR (FROM WELL CASING TOP, FT)	ft	NE	NE	147.35	140.83	141.62	141.27	142.58	146.27	--	145.63	143.64	137.61	141.63	139.02	139.39	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	--	--	--	--	--	--	Dry	--	--	--	--	--	--	1084.59	1084.36	1083.94	1084.05
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards PAL	NR 140 Standards ES	Well No./Sampling Date MW-5A 11/30/89	12/27/89	1/29/90	3/5/90	6/13/90	9/19/90	12/12/90	12/28/90	3/13/91	4/1/92	6/10/92	8/18/92	12/30/93	3/30/94	6/23/94	9/20/94
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.4	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
VINYL ACETATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	228	240	240	232	240	248	240	--	228	--	--	--	--	--	--	--
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	3.2	24.7	4.4	7.1	<	<	<	--	17.7	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	4.70	2.20	1.30	1.00	--	--	--	--	--	--	--	--	--	--	--	--
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	20	20	<	<	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	0.38	0.30	1.60	1.55	0.30	--	--	--	--	0.36	0.18	0.50	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	232	252	264	244	244	252	248	--	240	--	--	--	--	--	--	--
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	0.15	0.01	0.24	<	0.03	0.04	0.11	--	<	**0.42**	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	70	60	<	<	<	--	--	--	--	30	10	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	<	<	<	<	<	--	--	--	--	0.2	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	0.2	0.2	0.1	0.5	3	--	--	--	--	0.7	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	22	20	10	<	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.8	0.0	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1135.18	1135.05	1134.81	1134.56	--	--	--	--	--	--	--	--	1139.49	1137.18	1138.00	1137.62
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.61	7.60	7.57	7.65	--	--	--	--	--	--	--	--	7.55	7.00	7.64	--
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	302	391	371	378	453	464	319	391	410	419	414	487	379	280	428	427
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-5A																
		PAL	ES	12/14/94	3/28/95	6/7/95	9/18/95	10/23/95	12/12/95	3/18/96	6/5/96	6/21/96	9/19/96	12/3/96	3/27/97	6/19/97	9/11/97	12/3/97	3/25/98
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<	--	<	--	--	<	--	--	<	--	<0.3	--	<0.3	--	<0.3
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.4	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<	--	<	--	--	<	--	--	<	--	<0.3	--	<0.3	--	<0.3
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.3	--	<0.3	--	<0.3
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	--	--	--	--	<0.1
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<	--	<	--	--	<	--	--	<	--	<0.4	--	<0.4	--	<0.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	--	--	--	--	<0.1
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<	--	<	--	--	<	--	--	0.1	--	<0.2	--	<0.2	--	<0.2
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<	--	<	--	--	<	--	--	<	--	<0.4	--	<0.4	--	<0.4
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
VINYL ACETATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<	--	<	--	--	<	--	--	<	--	<0.2	--	<0.2	--	<0.2
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<	--	<	--	--	<	--	--	<	--	<0.1	--	<0.1	--	<0.1
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	--	--	220	--	--	230	--	--	--	--	--	--	--	--	--
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	<	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	<	--	--	<	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	6.2	--	--	17.8	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	--	--	--	2.00	--	--	<	--	--	--	--	--	--	--	--	--
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	<	--	--	<	<	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	0.19	0.03	--	0.15	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	--	--	--	200	--	--	--	--	--	--	--	--	--	--	--	--
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	0.01	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	4.9	<	--	1.5	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	<	--	--	<	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--	<	--	--	<	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	<	--	--	<	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	0.0	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	<	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	0.0	0.0	--	0.0	0.0	--	--	0.0	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1137.17	1136.50	1137.30	1137.53	--	1136.92	1137.13	1136.20	--	1136.50	1136.24	1136.04	1135.98	1135.87	1135.45	1135.29
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	--	--	--	--	8.18	7.83	--	--	7.71	--	--	--	--	--	--
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	391	377	398	404	--	401.21	420	412	--	415	--	418	389	390	300	385
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	--	10.00	--	--	--	--	--	--	--	10.70	18.20	11.40	7.30	8.90

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-5A															
		PAL	ES	6/17/98	9/15/98	12/15/98	3/30/99	6/17/99	9/28/99	12/29/99	3/29/00	9/20/00	3/28/01	9/13/01	3/27/02	10/1/02	3/26/03	6/12/03	9/25/03
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	<0.1	--	<0.19	--	<0.19	--	<0.28	<0.32	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.2	--	<0.3	--	<0.3	--	<0.21	<0.13	<0.15	<0.2	<0.42	<0.42	<0.42	--	<0.42
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.2	--	<0.52	--	<0.52	--	<0.47	<0.52	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.1	--	<0.2	--	<0.2	--	<0.32	<0.2	<0.14	<0.2	<0.5	<0.5	<0.5	--	<0.5
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.2	--	<0.15	--	<0.15	--	<0.31	<0.1	<0.15	<0.38	<0.36	<0.36	<0.36	--	<0.36
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.2	--	<0.4	--	<0.11	--	<0.42	<0.18	<0.15	<0.38	<0.39	<0.39	<0.39	--	<0.39
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.25	--	<0.25	--	<0.43	<0.2	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	<0.2	--	<0.94	--	<0.052	--	<0.81	<0.084	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	<0.2	--	<0.99	--	<0.99	--	<0.43	<0.092	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	<0.2	--	<1.04	--	<0.05	--	<0.43	<0.15	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.1	--	<0.46	--	<0.46	--	<0.17	<0.12	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<0.3	--	<1.46	--	<0.23	--	<0.38	<0.17	<0.25	<0.15	<0.61	<0.61	<0.61	--	<0.61
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.1	--	<0.4	--	<0.4	--	<0.3	<0.2	<0.12	<0.19	<1.1	<1.1	<1.1	--	<1.1
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.35	--	<0.35	--	<0.17	<0.35	<0.15	<0.28	<0.17	<0.17	<0.17	--	<0.17
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.09	--	<0.094	--	<0.49	<0.27	<0.15	<0.35	<0.25	<0.25	<0.25	--	<0.25
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.1	--	<0.35	--	<0.35	--	<0.13	<0.11	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	<0.1	--	<0.26	--	<0.26	--	<0.22	<0.12	--	--	--	--	--	--	--
1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.4	0.04	--	--	--	--	--	--	--	--	--	<0.13	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.78	--	<0.78	--	<0.27	<0.26	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.1	--	<0.19	--	<0.19	--	<0.13	<0.19	<0.15	<0.16	<0.31	<0.31	<0.31	--	<0.31
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.1	--	<0.34	--	<0.34	--	<0.39	<0.34	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.1	--	<0.17	--	<0.17	--	<0.26	<0.18	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.1	--	<0.25	--	<0.25	--	<0.2	<0.25	<0.13	<0.2	<0.83	<0.83	<0.83	--	<0.83
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.2	--	<0.17	--	<0.34	--	<0.38	<0.59	<0.15	<0.15	<0.57	<0.57	<0.57	--	<0.57
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.76	--	<0.04	--	<0.33	<0.15	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	<0.1	--	<0.35	--	<0.35	--	<0.37	<0.13	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	<0.1	--	<0.28	--	<0.28	--	<0.37	<0.13	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.23	--	<0.23	--	<0.53	<0.23	<0.15	<0.3	<0.59	<0.59	<0.59	--	<0.59
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.2	--	<0.1	--	<0.096	--	<0.27	<0.12	<0.15	<0.17	<0.31	<0.31	<0.31	--	<0.31
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<0.3	--	<0.5	--	<0.5	--	<0.63	<0.28	<0.15	<0.25	<0.44	<0.44	<0.44	--	<0.44
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.2	--	<0.2	--	<0.18	--	<0.27	<0.18	<0.14	<0.24	<0.27	<0.27	<0.27	--	<0.27
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.2	--	<0.24	--	<0.21	--	<0.53	<0.13	<0.15	<0.15	<0.29	<0.29	<0.29	--	<0.29
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.2	--	<0.19	--	<0.19	--	<0.27	<0.19	<0.15	<0.25	<0.23	<0.23	<0.23	--	<0.23
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.3	--	<0.1	--	<0.096	--	<0.44	<0.096	<0.12	<0.3	<0.26	<0.26	<0.26	--	<0.26
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.1	--	<0.19	--	<0.19	--	<0.33	<0.088	<0.15	<0.22	<0.87	<0.87	<0.87	--	<0.87
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.1	--	<0.33	--	<0.33	--	<0.32	<0.052	<0.15	<0.15	<3	<3	<3	--	<3
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.2	--	<0.59	--	<0.27	--	<0.6	<0.21	<0.25	<0.25	<0.46	<0.46	<0.46	--	<0.46
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.44	--	<0.25	--	<0.26	<0.12	<0.39	<0.3	<0.51	<0.51	<0.51	--	<0.51
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.1	--	<0.4	--	<0.4	--	<0.25	<0.4	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.1	--	<0.19	--	<0.19	--	<0.21	<0.30	<0.50	<0.5	<0.5	<0.5	<0.5	--	<0.5
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	<0.2	--	<0.89	--	<0.49	--	<0.55	<0.34	<0.15	<0.15	<0.7	<0.7	<0.7	--	<0.7
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.95	--	<0.074	--	<0.55	<0.21	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.1	--	<0.23	--	<0.23	--	<0.35	<0.12	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.1	--	<0.49	--	<0.49	--	<0.18	<0.11	<0.15	<0.28	<0.29	<0.29	<0.29	--	<0.29
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.1	--	<0.73	--	<0.73	--	<0.26	<0.13	<0.30	<0.3	<0.3	<0.3	<0.3	--	<0.3
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.2	--	<0.54	--	<0.082	--	<1.31	<0.082	<0.80	<0.8	<0.8	<0.8	<0.8	--	<0.8
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.36	--	<0.36	--	<0.3	<0.11	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.1	--	<0.25	--	<0.25	--	<0.17	<0.092	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.1	--	<0.38	--	<0.036	--	<0.36	<0.036	<0.15	<0.36	<0.51	<0.51	<0.51	--	<0.51
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.1	--	<0.65	--	<0.65	--	<0.17	<0.17	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.2	--	<0.45	--	<0.45	--	<0.31	<0.11	<0.15	<0.27	<0.3	<0.3	<0.3	--	<0.3
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.1	--	<0.52	--	<0.12	--	<0.3	<0.094	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.2	--	<0.08	--	<0.084	--	<0.46	<0.12	<0.15	<0.18	<0.29	<0.29	<0.29	--	<0.29
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.1	--	<0.34	--	<0.34	--	<0.33	<0.14	<0.15	<0.26	<0.32	<0.32	<0.32	--	<0.32
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.2	--	<0.11	--	<0.11	--	<0.32	0.18	<0.40	<0.4	<0.3	<0.3	<0.3	--	<0.3
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.1	--	<0.21	--	<0.21	--	<0.27	<0.17	<0.15	<0.25	<0.39	<0.39	<0.39	--	<0.39
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.1	--	<0.14	--	<0.14	--	<0.41	<0.14	--	<0.18	<0.25	<0.25	<0.25	--	<0.25
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.4	--	<0.45	--	<0.45	--	<0.3	<0.088	<0.11	<0.17	<0.71	<0.71	<0.71	--	<0.71
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.1	--	<0.21	--	<0.21	--	<0.26	<0.098	<0.40	<0.26	<0.36	<0.36	<0.36	--	<0.36
VINYL ACETATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.2	--	<0.31	--	<0.14	--	<0.54	<0.23	<0.11	<0.39	<0.2	<0.2	<0.2	--	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.2	--	<0.39	--	<0.39	--	<0.44	--	<0.40	<0.4	<0.62	<0.62	<0.62	--	<0.62
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.1	--	<0.18	--	<0.18	--	<0.4	<0.13	<0.15	<0.17	<0.3	<0.3	<0.3	--	<0.3
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	243	227	--	232
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<3	<3	--	<
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	3.02	3.47	--	3.52
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	237	238	--	237
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	<0.003	<0.003	--	<
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1136.20	1136.77	1136.40	1135.94	1136.04	1136.32	--	1135.57	1136.32	1135.56	1136.79	1135.69	1135.42	1134.83	1134.78	1134.49
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	--	6.80	7.74	7.82	7.25	7.84	7.25	7.60	7.94	6.51	7.29	7.60	7.76	--	7.81
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	496	373	391	405	388	479	388	387	396	386	404	376	425	421	--	466
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	14.10	16.40	7.80	11.50	11.90	10.30	8.50	8.80	10.30	5.50	10.50	11.20	14.50	9.70	--	9.70

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-5A															
		PAL	ES	3/24/04	9/8/04	3/22/05	9/29/05	3/29/06	9/26/06	3/26/07	9/27/07	3/20/08	9/16/08	9/15/09	3/30/10	9/21/10	3/29/11	9/20/11	4/3/12
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.42	<0.42	<0.42	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.9	<0.9
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.5	<0.5	<0.3	--	<0.1	<0.1	<0.1	<0.2	<0.3	<0.3	<0.4	<0.4	<0.4	<0.4	<0.42	<0.42
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.5	<0.5	<0.5	<0.15	<0.15	<0.15	<0.15	<0.2	<0.2	<0.2	<0.4	<0.4	<0.4	<0.4	<0.75	<0.75
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.5	<0.5	<0.5	--	<0.15	<0.15	<0.15	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.57	<0.57
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<1.3	<1.3	<1.3	<0.3	<0.3	<0.35	<0.35	<1	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.7	<1.7
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<1.1	<1.1	<1.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.61	<0.61
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.4	<0.4	<0.4	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.36	<0.36
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.4	<0.4	<0.4	--	<0.1	<0.1	<0.1	<0.2	<0.3	<0.3	<0.4	<0.4	<0.4	<0.4	<0.49	<0.49
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.4	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<5	<5
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.31	<0.31	<0.31	<0.15	<0.15	<0.15	<0.15	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.41	<0.41
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.83	<0.83	<0.3	<0.1	<0.1	<0.1	<0.1	<0.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.56	<0.56
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.8	<0.8	<0.8	<0.15	<0.15	<0.15	<0.15	<1	<1	<1	<1	<1	<1	<1	<0.91	<0.91
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	2.33	<0.2	<0.2	<0.2	<1	<1	<1	<1	<1	<1	<1	<0.66	<0.66
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.5	<0.5	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.49	<0.49
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.7	<0.7	<0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.41	<0.41
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<1	<1	<1	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.7	<0.7	<0.7	<0.7	<0.97	<0.97
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<0.4	<0.4	<0.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.3	<1.3
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.29	<0.29	<0.29	<0.2	<0.2	<0.2	<0.2	<0.3	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.24	<0.24
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.4	<0.4	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.3	<0.3	<0.4	<0.4	<0.4	<0.4	<0.83	<0.83
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.87	<0.87	<0.87	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.4	<0.4	<0.4	<0.4	<0.81	<0.81
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<3	<3	<3	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.3	<0.4	<0.4	<0.4	<0.4	<0.56	<0.56
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.7	<0.7	<0.7	<0.25	<0.25	<0.25	<0.25	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.99	<0.99
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.5	<0.5	<0.3	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.43	<0.43
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2.6	<2.6
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<1	<1	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.3	<0.3	<0.3	<0.3	<0.79	<0.79
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.5	<0.5	<0.5	--	<0.15	<0.15	<0.15	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.87	<0.87
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4.3	<4.3
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.3	<0.3	<0.3	<0.1	<0.1	<0.1	<0.1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.54	<0.54
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.8	<0.8	<0.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.89	<0.89
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.6	<0.6	<0.6	<0.75	<0.75	<0.75	<0.75	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.83	<0.83
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.6	<0.6	<0.6	<0.75	<0.75	<0.75	<0.75	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.95	<0.95
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.29	<0.29	<0.29	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.86	<0.86
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.45	<0.45	<0.45	<0.1	<0.1	<0.1	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.45	<0.45
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	<0.7	<0.7	<0.7	<0.7	<1	<1	<1	<2	<2	<2	<2	<1.7	<1.7
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.3	<0.3	<0.3	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.67	<0.67
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.39	<0.39	<0.39	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.89	<0.89
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.25	<0.25	<0.25	<0.1	<0.1	<0.1	<0.1	<0.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.19	<0.19
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.44	<0.44	<0.44	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.94	<0.94
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.48	<0.48
VINYL ACETATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.2	<0.2	<0.2	<0.15	<0.15	<0.15	<0.15	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.18	<0.18
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.62	<0.62	<0.62	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.3	<0.3	<0.3	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.6	<0.6
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	251	254	253	247	269	260	252	259	308	250	270	260	251	262	247	262
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	<	<	29.1	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	3.60	3.24	3.21	2.73	2.96	3.16	2.98	4.05	5.04	4.47	3.82	3.91	4.34	3.95	5.00	4.50
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	260	246	253	247	264	256	252	243	251	241	248	255	245	255	243	240
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	<		<	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	9.47	9.27	9.35	9.63	10.60	9.97	10.60	8.93	9.06	8.81	7.96	8.40	8.60
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	0.0	0.0	0.0	--	--	--	0.0	0.0	--	--	1.0	1.0	1.0	0.0	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	0.0	--	--	0.0	0.0	0.0	--	--	1.0	1.0	1.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1133.98	1134.69	1134.53	1133.88	1133.41	1133.40	1133.15	1134.77	1135.66	1139.02	1135.59	1135.02	1136.62	1135.97	1136.99	1135.45
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	7.82	7.88	8.01	7.94	--	8.01	--	7.91	8.11	7.65	7.70	7.72	7.60	7.65	7.60
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	--	511	497	507	502	--	466	--	426	428	473	467	464	417	481	490
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	11.00	7.20	9.20	6.50	--	14.90	--	7.10	11.00	12.10	12.20	12.00	10.50	12.40	11.90

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-5A															
		PAL	ES	9/25/12	4/3/13	9/25/13	4/29/14	9/26/14	3/25/15	9/16/15	3/30/16	9/22/16	3/13/17	9/12/17	3/15/18	9/11/18	3/12/19	9/10/19	3/9/20
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	<0.4	<0.25	<0.25	<0.25	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.40	<0.40
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.9	<0.29	<0.2	<0.2	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.29	<0.29
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.3	<0.23	<0.23	<0.23	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.30	<0.30
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.42	<0.4	<0.28	<0.28	<0.28	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.30	<0.30
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.75	<0.3	<0.19	<0.19	<0.19	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.57	<0.24	<0.31	<0.31	<0.31	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	<0.4	--	--	--	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.30	<0.30
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	<0.4	<0.24	<0.24	<0.24	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.23	<0.23
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	<0.4	<0.45	<0.45	<0.45	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.30	<0.30
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	<0.4	<0.31	<0.31	<0.31	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.28	<0.28
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.4	<0.14	<0.14	<0.14	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.29	<0.29
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<1.7	<0.4	<0.87	<0.87	<0.87	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.25	<0.25
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<0.61	<0.3	<0.36	<0.36	<0.36	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.30	<0.30
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.36	<0.3	<0.28	<0.28	<0.28	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.24	<0.24
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.49	<0.4	<0.2	<0.2	<0.2	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.18	<0.18
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.4	<0.18	<0.18	<0.18	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.27	<0.27
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	<0.29	<0.13	<0.13	<0.13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.17	<0.17
1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.4	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	<0.3	<0.32	<0.32	<0.32	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<4	--	--	--	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<3.0	<3.0
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	<4	--	--	--	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<2.2	<2.2
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	<5	<2.9	--	--	--	<9.0	<9.0	<9.0	<9.0	<9.0	<9.0	<9.0	<9.0	<9.0	<4.0	<4.0
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.41	<0.3	<0.074	<0.074	<0.074	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.40	<0.40
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.3	<0.25	<0.25	<0.25	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.40	<0.40
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.5	<0.4	<0.4	<0.4	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.30	<0.30
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.56	<0.3	<0.17	<0.17	<0.17	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.29	<0.29
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.91	<0.3	<0.31	<0.31	<0.31	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.90	1.3
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	<0.4	<0.13	<0.13	<0.13	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.29	<0.29
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	<0.3	<0.15	<0.15	<0.15	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	<0.4	<0.14	<0.14	<0.14	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	<0.66	<0.5	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.60	<0.60
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.49	<0.27	<0.26	<0.26	<0.26	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.41	<0.28	<0.14	<0.14	<0.14	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<0.97	<0.3	<0.34	<0.34	<0.34	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<1.3	<0.23	<0.2	<0.2	<0.2	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.24	<0.27	<0.18	<0.18	<0.18	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.60	0.62
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.83	<0.3	<0.12	<0.12	<0.12	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.2	<0.26	<0.18	<0.18	<0.18	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.16	<0.16
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.81	<0.3	<0.32	<0.32	<0.32	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.30	<0.30
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.56	<0.3	<0.33	<0.33	<0.33	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.22	<0.22
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.99	<0.4	<0.2	<0.2	<0.2	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.43	<0.4	<0.68	<0.68	<0.68	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.3	<0.15	<0.15	<0.15	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.40	<0.40
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<2.6	<0.3	<0.13	<0.13	<0.13	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<0.79	<0.3	<0.19	<0.19	<0.19	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.40	<0.40
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.5	<0.26	<0.26	<0.26	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.40	<0.40
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.3	<0.14	<0.14	<0.14	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.30	<0.30
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.87	<0.3	<0.15	<0.15	<0.15	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.26	<0.26
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	<4.3	<4	--	--	--	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<2.6	<2.6
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.54	<0.4	<0.24	<0.24	<0.24	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.89	<0.3	<0.16	<0.16	<0.16	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.30	<0.30
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.4	<0.13	<0.13	<0.13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.3	<0.21	<0.21	<0.21	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.25	<0.25
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.83	<0.4	<0.27	<0.27	<0.27	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.30	<0.30
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.29	<0.2	<0.2	<0.2	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.30	<0.30
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.95	<0.3	<0.15	<0.15	<0.15	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.30	<0.30
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.4	<0.17	<0.17	<0.17	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.86	<0.27	<0.1	<0.1	<0.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.29	<0.29
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.45	<0.29	<0.17	<0.17	<0.17	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.27	<0.27
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	<1.7	<3	--	--	--	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.67	<0.3	1.1	0.49	0.87	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.21	<0.21
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.89	<0.3	<0.25	<0.25	<0.25	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.30	<0.30
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.19	<0.3	<0.21	<0.21	<0.21	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.23	<0.23
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.94	<0.3	<0.28	<0.28	<0.28	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.40	<0.40
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.48	<0.5	<0.19	<0.19	<0.19	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
VINYL ACETATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.18	<0.18	<0.1	<0.1	<0.1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.14	<0.14
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.6	<0.068	<0.068	<0.068	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.70	<0.70
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.6	<0.3	<0.34	<0.34	<0.34	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.26	<0.26
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	241	250	220	210	190	240	250	270	250	280	280	300	290	270	280	280
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	4.60	4.60	4.20	5.20	5.20	4.50	4.20	5.10	4.50	4.60	4.00	3.00	3.60	4.00	3.60	3.40
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	246	243	230	260	250	269	293	242	235	225	247	244	256	273	260	277
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	8.60	8.30	8.00	8.90	8.10	8.70	8.00	8.70	8.80	8.70	8.20	6.90	7.70	8.20	7.50	8.10
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	0.0	0.0	<	<	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	--	--	<	<	<	--	<	<	<	<	<	<	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	<	<	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1135.05	1134.29	1136.60	1135.52	1136.42	1135.29	1134.81	1135.38	1136.48	1136.96	1139.30	1136.26	1136.54	1137.88	1139.73	1137.72
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.64	7.21	7.78	7.80	7.76	7.68	7.53	7.81	8.17	7.79	7.79	7.41	6.53	7.58	7.28	7.41
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	485	468	462	486	107	513	464	473	455	475	478	483	487	502	518	524
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	12.50	9.90	12.80	9.50	14.10	10.60	10.40	10.50	10.20	9.31	10.26	9.94	10.23	9.66	10.32	10.05

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-5A				
		PAL	ES	9/15/20	3/16/21	9/14/21	3/14/22	9/13/22
VOCs (ug/L)								
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	<0.40	<0.40	<0.34	<0.34	<0.34
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.29	<0.29	<0.38	<0.38	<0.38
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	<0.30	<0.30	<0.36	<0.36	<0.36
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.30	<0.30	<0.27	<0.27	<0.27
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.30	<0.30	<0.28	<0.28	<0.28
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.40	<0.40	<0.49	<0.49	<0.49
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.41	<0.41	<0.41
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	<0.23	<0.23	<0.43	<0.43	<0.43
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	<0.30	<0.30	<0.35	<0.35	<0.35
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	<0.28	<0.28	<0.50	<0.50	<0.50
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<0.29	<0.29	<0.34	<0.34	<0.34
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<0.25	<0.25	<0.49	<0.49	<0.49
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<0.30	<0.30	<0.33	<0.33	<0.33
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.24	<0.24	<0.69	<0.69	<0.69
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.18	<0.18	<0.37	<0.37	<0.37
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<0.27	<0.27	<0.30	<0.30	<0.30
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	<0.17	<0.17	<0.28	<0.28	<0.28
1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.4	0.04	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.31	<0.31	<0.31
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<3.0	<3.0	<3.3	<3.3	<3.3
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	<2.2	<2.2	<3.7	<3.7	<3.7
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	<4.0	<4.0	<4.1	<4.1	<4.1
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.40	<0.40	<0.47	<0.47	<0.47
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.40	<0.33	<0.33	<0.33
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.26	<0.26	<0.26
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.29	<0.29	<0.76	<0.76	<0.76
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.90	<0.90	<0.72	<0.72	<0.72
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	<0.29	<0.29	<0.34	<0.34	<0.34
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	<0.40	<0.40	<0.33	<0.33	<0.33
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	<0.40	<0.40	<0.27	<0.27	<0.27
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	<0.60	<0.60	<0.83	<0.83	<0.83
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.30	<0.30	<0.37	<0.37	<0.37
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.30	<0.30	<0.37	<0.37	<0.37
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<0.50	<0.50	<1.1	<1.1	<1.1
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<0.30	<0.30	<0.46	<0.46	<0.46
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.60	<0.60	<1.3	<1.3	<1.3
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.30	<0.30	<0.41	<0.41	<0.41
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.16	<0.16	<0.34	<0.34	<0.34
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.30	<0.30	<0.36	<0.36	<0.36
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.22	<0.22	<0.45	<0.45	<0.45
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.40	<0.40	<0.63	<0.63	<0.63
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.40	<0.40	<1.2	<1.2	<1.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.40	<0.26	<0.26	<0.26
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<0.30	<0.30	<0.42	<0.42	<0.42
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<0.40	<0.40	<0.41	<0.41	<0.41
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.40	<0.57	<0.57	<0.57
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.39	<0.39	<0.39
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.26	<0.26	<0.30	<0.30	<0.30
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	<2.6	<2.6	<2.9	<2.9	<2.9
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.30	<0.30	<0.28	<0.28	<0.28
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.30	<0.30	<0.35	<0.35	<0.35
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.34	<0.34	<0.34
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.25	<0.25	<0.31	<0.31	<0.31
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.30	<0.30	<0.36	<0.36	<0.36
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.31	<0.31	<0.31
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.30	<0.30	<0.33	<0.33	<0.33
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.29	<0.29	<0.29
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.29	<0.29	<0.33	<0.33	<0.33
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.27	<0.27	<0.55	<0.55	<0.55
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	<3.0	<3.0	<3.4	<3.4	<3.4
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.21	<0.21	<0.27	<0.27	<0.27
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.30	<0.30	<0.35	<0.35	<0.35
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.23	<0.23	<0.57	<0.57	<0.57
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.40	<0.40	<0.50	<0.50	<0.50
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.30	<0.30	<0.39	<0.39	<0.39
VINYL ACETATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.14	<0.14	<0.15	<0.15	<0.15
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.70	<0.70	<0.74	<0.74	<0.74
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.26	<0.26	<0.72	<0.72	<0.72
INORGANICS								
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	290	260	260	250	250
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	3.40	2.90	3.30	3.50	3.70
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	281	282	262	304	271
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	7.90	8.40	8.00	8.10	8.30
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--
FIELD PARAMETERS								
COMMENT, SAMPLE COLOR		NE	NE	0.0	0.0	0.0	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	<	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1138.27	1136.34	1135.86	1135.52	1135.74
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.44	7.23	7.30	7.22	7.19
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	533	505	506	488	491
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	10.33	10.15	10.38	11.10	10.20

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-6															
		PAL	ES	3/25/88	4/25/88	11/9/88	12/21/88	11/30/89	12/27/89	1/29/90	3/5/90	6/13/90	9/19/90	12/12/90	12/28/90	3/13/91	4/1/92	6/10/92	8/18/92
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	398	3490	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	--	160	164	172	180	184	168	184	212	184	--	180	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	270	--	<	5.4	3.7	8.7	9.9	<	<	4.5	<	--	3.4	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	--	--	--	--	4.60	3.80	3.00	3.00	--	--	--	--	--	--	--	--
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	10	30	<	<	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	0.27	0.22	1.30	1.30	0.30	--	--	--	--	0.28	0.14	0.68
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	--	--	184	176	196	220	208	192	200	208	204	--	204	--	--	--
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	<	--	0.020	0.020	0.020	<	0.050	0.040	<	<	0.070	--	<	0.030	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	<	<	3	<	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	60	40	10	<	<	--	--	--	--	<	10	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	<	<	<	<	<	--	--	--	--	<	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	2.7	2.9	2.0	2.5	6.8	--	--	--	--	4.1	4.1	3.6
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	<	<	<	<	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	<	10	10	<	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1061.49	1061.20	1059.37	1058.85	1056.42	1056.13	1055.76	1055.46	--	--	--	--	--	--	--	--
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	--	--	--	8.13	7.75	7.62	7.70	--	--	--	--	--	--	--	--
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	323	--	302	295	305	377	303	357	362	390	357	378	357	364	382	428
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-6															
		PAL	ES	12/30/93	3/30/94	6/23/94	9/20/94	12/14/94	3/28/95	6/7/95	9/18/95	12/12/95	3/18/96	6/5/96	9/19/96	12/3/96	3/27/97	6/19/97	9/11/97
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.3
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.3
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.3
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.4
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	398	3490	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<	--	--	--	<0.1
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<	--	--	--	<0.1
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.4
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.2
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	<	--	--	--	<	--	--	--	<	--	--	--	<0.1
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	180	177	180	176	184	172	172	172	192	180	180	170	260	210	180	210
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	14.8	48.0	<	<	13.0	47.0	<	6.5	<	3.5	<	<	<1.0	<	<5	<2
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	1.00	3.00	1.00	2.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	3.70	4.10	2.10	4.40
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	0.20	0.13	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	192	176	184	185	168	171	173	180	180	180	190	190	200	190	180	190
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	<	<	<	0.010	<	0.009	0.010	0.010	<	<	0.014	0.021	<0.006	<0.006	<0.006	<0.006
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	<	3	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	3.1	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	<	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	<	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	0.00	0.08	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1071.62	1069.00	1068.33	1066.27	1065.11	1235.37	1065.59	1064.96	1063.85	1063.47	1064.95	1063.73	1074.09	1073.05	1070.98	1070.87
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.23	7.00	7.31	7.42	7.49	7.42	8.58	8.42	8.10	7.87	7.77	7.75	7.29	6.90	7.07	7.05
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	325	356	272	354	397	335	349	343	335	336	343	336	340	324	321	334
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	6.50	--	--	--	--	--	12.00	11.00	--	--	--	--	7.40	15.30	12.40	12.90

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-6																
		PAL	ES	12/3/97	3/25/98	6/17/98	9/15/98	12/15/98	6/17/99	9/28/99	12/29/99	3/29/00	3/28/01	9/13/01	3/27/02	9/30/02	3/26/03	6/12/03	9/25/03
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	<0.1	--	--	<0.19	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	<0.2	--	--	<0.3	--	--	--	--	--	<0.42	--	--	<0.42
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<0.2	--	--	<0.52	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.1	--	--	<0.2	--	--	--	--	--	<0.5	--	--	<0.5
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	<0.2	--	--	<0.15	--	--	--	--	--	<0.36	--	--	<0.36
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	<0.2	--	--	<0.11	--	--	--	--	--	<0.39	--	--	<0.39
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	<0.2	--	--	<0.25	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	<0.2	--	--	<0.052	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	<0.2	--	--	<0.99	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	<0.2	--	--	<0.05	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<0.1	--	--	<0.46	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	<0.3	--	--	<0.23	--	--	--	--	--	<0.61	--	--	<0.61
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	<0.1	--	--	<0.4	--	--	--	--	--	<1.1	--	--	<1.1
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.2	--	--	<0.35	--	--	--	--	--	<0.17	--	--	<0.17
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.2	--	--	<0.094	--	--	--	--	--	<0.25	--	--	<0.25
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<0.1	--	--	<0.35	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	<0.1	--	--	<0.26	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	<0.2	--	--	<0.78	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.1	--	--	<0.19	--	--	--	--	--	<0.31	--	--	<0.31
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	<0.34	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	<0.17	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	<0.1	--	--	<0.25	--	--	--	--	--	<0.83	--	--	<0.83
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	<0.2	--	--	<0.34	--	--	--	--	--	<0.57	--	--	<0.57
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	<0.2	--	--	<0.04	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	<0.35	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	<0.28	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.2	--	--	<0.23	--	--	--	--	--	<0.59	--	--	<0.59
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	<0.2	--	--	<0.096	--	--	--	--	--	<0.31	--	--	<0.31
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	<0.3	--	--	<0.5	--	--	--	--	--	<0.44	--	--	<0.44
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	<0.2	--	--	<0.18	--	--	--	--	--	<0.27	--	--	<0.27
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	<0.2	--	--	<0.21	--	--	--	--	--	<0.29	--	--	<0.29
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	<0.2	--	--	<0.19	--	--	--	--	--	<0.23	--	--	<0.23
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.3	--	--	<0.096	--	--	--	--	--	<0.26	--	--	<0.26
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	<0.1	--	--	<0.19	--	--	--	--	--	<0.87	--	--	<0.87
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	<0.33	--	--	--	--	--	<3	--	--	<3
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	<0.2	--	--	<0.27	--	--	--	--	--	<0.46	--	--	<0.46
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.2	--	--	<0.25	--	--	--	--	--	<0.51	--	--	<0.51
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	<0.4	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	<0.1	--	--	<0.19	--	--	--	--	--	<0.5	--	--	<0.5
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	398	3490	--	--	--	<0.1	--	--	<0.49	--	--	--	--	--	<0.7	--	--	<0.7
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.3	--	--	<0.074	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	<0.23	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	<0.2	--	--	<0.49	--	--	--	--	--	<0.29	--	--	<0.29
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	<0.1	--	--	<0.73	--	--	--	--	--	<0.3	--	--	<0.3
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<0.2	--	--	<0.082	--	--	--	--	--	<0.8	--	--	<0.8
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.2	--	--	<0.36	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	<0.25	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	<0.1	--	--	<0.036	--	--	--	--	--	<0.51	--	--	<0.51
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	<0.65	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	<0.2	--	--	<0.45	--	--	--	--	--	<0.3	--	--	<0.3
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	<0.12	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<0.2	--	--	<0.084	--	--	--	--	--	<0.29	--	--	<0.29
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.1	--	--	<0.34	--	--	--	--	--	<0.32	--	--	<0.32
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	<0.2	--	--	<0.11	--	--	--	--	--	<0.3	--	--	<0.3
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	<0.1	--	--	<0.21	--	--	--	--	--	<0.39	--	--	<0.39
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.1	--	--	<0.14	--	--	--	--	--	<0.25	--	--	<0.25
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	<0.4	--	--	<0.45	--	--	--	--	--	<0.71	--	--	<0.71
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.1	--	--	<0.21	--	--	--	--	--	<0.36	--	--	<0.36
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<0.2	--	--	<0.14	--	--	--	--	--	<0.2	--	--	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	<0.2	--	--	<0.39	--	--	--	--	--	<0.62	--	--	<0.62
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	<0.1	--	--	<0.18	--	--	--	--	--	<0.3	--	--	<0.3
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	190	180	180	180	190	180	180	180	170	--	--	--	165	180	--	175
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	<2	2.1	<2	<2	<2	<2	<2	<2	4.2	--	--	--	<3	<3	--	13.7
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	4.20	3.90	2.93	3.40	3.40	3.90	4.50	3.90	4.00	--	--	--	5.11	5.72	--	6.13
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	190	180	190	190	190	190	190	190	190	--	--	--	192	201	--	204
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	<0.006	<0.006	<18	<0.006	0.008	0.007	0.010	0.018	<0.006	--	--	--	<0.003	0.016	--	<
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1070.10	1069.98	1071.20	1074.85	1074.26	--	1074.47	1073.50	1071.91	1073.50	1057.40	1053.85	1072.19	1070.27	1070.14	1059.78
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.27	7.76	7.00	7.47	7.72	7.68	7.06	7.35	7.26	--	--	--	7.65	7.79	--	7.87
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	361	339	304	355	342	337	348	343	337	--	--	--	362	367	--	402
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	8.40	11.60	16.20	16.50	9.20	12.30	12.10	10.00	10.40	--	--	--	13.10	11.10	--	10.60

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-6															
		PAL	ES	3/25/04	9/8/04	3/23/05	9/29/05	3/28/06	9/26/06	3/27/07	9/26/07	3/19/08	9/15/08	3/30/09	9/15/09	3/29/11	9/20/11	4/3/12	9/25/12
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.42	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.5	--	--	--	<0.9
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.5	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	--	--	<0.42
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.5	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.4	--	--	--	<0.75
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.5	--	<0.15	--	<0.15	--	<0.4	--	<0.4	--	<0.4	--	--	--	<0.57
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<1.3	--	<0.3	--	<0.35	--	<1	--	<1.3	--	<1.3	--	--	--	<1.7
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<1.1	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.3	--	--	--	<0.56
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.4	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.3	--	--	--	<0.36
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.4	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	--	--	<0.49
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--	--	--	<5
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.31	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	--	--	<0.41
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.83	--	<0.1	--	<0.1	--	<0.2	--	<0.4	--	<0.4	--	--	--	<0.56
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.8	--	<0.15	--	<0.15	--	<1	--	<1	--	<1	--	--	--	<0.91
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	<0.2	--	<0.2	--	<1	--	<1	--	<1	--	--	--	<0.66
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.5	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.3	--	--	--	<0.49
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.7	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.2	--	--	--	<0.41
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<1	--	<0.6	--	<0.6	--	<0.6	--	<0.6	--	<0.7	--	--	--	<0.97
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.4	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	--	--	<1.3
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.29	--	<0.2	--	<0.2	--	0.56	--	<0.4	--	<0.4	--	--	--	<0.24
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.4	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.4	--	--	--	<0.83
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.5	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	--	--	<0.2
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.87	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.4	--	--	--	<0.81
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<3	--	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	--	--	<0.6
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.7	--	<0.25	--	<0.25	--	<0.3	--	<0.3	--	<0.3	--	--	--	<0.99
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.5	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	--	--	<0.43
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.5	--	<0.1	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	--	--	<0.54
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	398	3490	--	<1	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	--	--	<0.79
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.5	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	--	--	<0.87
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	<2	--	<2	--	<2	--	<2	--	<2	--	--	--	<4.3
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.3	--	<0.1	--	<0.1	--	<0.2	--	<0.5	--	<0.5	--	--	--	<0.61
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.8	--	<1	--	<1	--	<1	--	<1	--	<1	--	--	--	<0.89
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.6	--	<0.75	--	<0.75	--	<0.8	--	<0.8	--	<0.8	--	--	--	<0.83
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.6	--	<0.75	--	<0.75	--	<0.8	--	<0.8	--	<0.8	--	--	--	<0.95
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.29	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	--	--	<0.86
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.45	--	<0.1	--	<0.1	--	<0.3	--	<0.3	--	<0.3	--	--	--	<0.45
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	<0.7	--	<0.7	--	<1	--	<1	--	<2	--	--	--	<1.7
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.3	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	--	--	<0.67
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.39	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.5	--	--	--	<0.89
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.25	--	<0.1	--	<0.1	--	<0.2	--	<0.4	--	<0.4	--	--	--	<0.19
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.44	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	--	--	<0.94
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.5	--	<0.2	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--	--	--	<0.48
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.2	--	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	--	--	<0.18
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.62	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	--	--	<2.6
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.3	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	--	--	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	190	192	182	179	206	244	202	228	--	201	--	204	--	--	186	186
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	7.63	7.98	7.63	10.10	10.70	11.30	13.00	12.80	13.20	11.40	7.84	6.85	--	--	6.90	7.00
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	218	218	212	216	239	230	238	230	237	236	216	201	--	--	200	208
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	252	--	193	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	--	--	--	6.52	6.44	6.58	7.05	7.82	7.82	7.39	6.91	6.11	--	--	5.80	5.70
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	--	--	--	--	--	--	--	1063.20	1065.75	--	--	--	Broken	Broken	1065.94	--
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	7.86	7.68	7.89	7.86	--	7.84	--	7.94	7.78	8.12	7.73	--	--	7.73	7.77
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	--	466	445	471	488	--	473	--	418	412	374	419	--	--	418	417
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	12.20	9.70	9.60	10.60	--	11.20	--	9.90	11.80	11.60	12.50	--	--	13.40	13.00

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-6															
		PAL	ES	4/3/13	9/25/13	4/29/14	9/25/14	3/25/15	9/16/15	3/30/16	9/22/16	3/14/17	9/12/17	3/15/18	9/11/18	3/12/19	9/10/19	3/10/20	9/15/20
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	<0.25	--	<0.25	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.40	--	<0.40
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.2	--	<0.2	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.29	--	<0.29
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.23	--	<0.23	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.30	--	<0.30
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.28	--	<0.28	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.19	--	<0.19	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.31	--	<0.31	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	<0.34	--	<0.34	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.30	--	<0.30
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	<0.24	--	<0.24	--	<0.80	--	<0.80	--	<0.80	--	<0.80	--	<0.23	--	<0.23
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	<0.45	--	<0.45	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	<0.31	--	<0.31	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.28	--	<0.28
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.14	--	<0.14	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.29	--	<0.29
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<0.87	--	<0.87	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.25	--	<0.25
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.36	--	<0.36	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.28	--	<0.28	--	<0.26	--	<0.26	--	<0.26	--	<0.26	--	<0.24	--	<0.24
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.2	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.18	--	<0.18
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.18	--	<0.18	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.27	--	<0.27
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	<0.13	--	<0.13	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.17	--	<0.17
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	<0.32	--	<0.32	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	<7.0	--	<7.0	--	<7.0	--	<7.0	--	<3.0	--	<3.0
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	<6.0	--	<6.0	--	<6.0	--	<6.0	--	<2.2	--	<2.2
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	<9.0	--	<9.0	--	<9.0	--	<9.0	--	<4.0	--	<4.0
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.074	--	<0.074	--	<0.24	--	<0.24	--	<0.24	--	<0.24	--	<0.40	--	<0.40
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.25	--	<0.25	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.40	--	<0.40
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.4	--	<0.4	--	<0.80	--	<0.80	--	<0.80	--	<0.80	--	<0.30	--	<0.30
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.17	--	<0.17	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.29	--	<0.29
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.31	--	<0.31	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.90	--	<0.90
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	<0.13	--	<0.13	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.29	--	<0.29
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	<0.15	--	<0.15	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	<0.14	--	<0.14	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	168.8	--	--	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.60	--	<0.60
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.26	--	<0.26	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.14	--	<0.14	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<0.34	--	<0.34	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.50
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.2	--	<0.2	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.18	--	<0.18	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.60	--	<0.60
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.12	--	<0.12	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.18	--	<0.18	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.16	--	<0.16
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.32	--	<0.32	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.33	--	<0.33	--	<0.80	--	<0.80	--	<0.80	--	<0.80	--	<0.22	--	<0.22
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.2	--	<0.2	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.68	--	<0.68	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.40	--	<0.40
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.15	--	<0.15	--	<0.29	--	<0.29	--	<0.29	--	<0.29	--	<0.40	--	<0.40
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.13	--	<0.13	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	398	3490	--	<0.19	--	<0.19	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.40	--	<0.40
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.26	--	<0.26	--	<0.90	--	<0.90	--	<0.90	--	<0.90	--	<0.40	--	<0.40
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.14	--	<0.14	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.15	--	<0.15	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.26	--	<0.26
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	<4.0	--	<4.0	--	<4.0	--	<4.0	--	<2.6	--	<2.6
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.24	--	<0.24	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.16	--	<0.16	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.30	--	<0.30
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.13	--	<0.13	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.21	--	<0.21	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.25	--	<0.25
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.27	--	<0.27	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.2	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.15	--	<0.15	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.17	--	<0.17	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.1	--	<0.1	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.29	--	<0.29
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.17	--	<0.17	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.27	--	<0.27
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	<3.0	--	<3.0	--	<3.0	--	<3.0	--	<3.0	--	<3.0
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	1.2	--	0.83	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.21	--	<0.21
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.25	--	<0.25	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.21	--	<0.21	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.23	--	<0.23
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.28	--	<0.28	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.40	--	<0.40
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.19	--	<0.19	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.1	--	<0.1	--	<0.19	--	<0.19	--	<0.19	--	<0.19	--	<0.14	--	<0.14
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.068	--	<0.068	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.70	--	<0.70
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.26	--	<0.26
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	190	180	160	150	--	190	220	190	210	220	220	220	200	200	200	200
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	7.90	8.20	9.20	9.50	--	8.10	9.00	8.90	9.00	10.00	8.00	7.70	8.80	8.80	7.70	8.80
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	201	210	210	210	--	223	204	204	187	204	198	209	217	206	211	216
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	5.20	5.00	5.30	5.50	--	4.90	5.80	6.20	6.00	5.70	4.20	5.20	5.80	5.50	5.40	5.80
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	<	<	0.00	--	0.00	<	0.00	0.00	0.00	<	0.00	0.00	<	<	<
COMMENT, SAMPLE ODOR		NE	NE	--	<	--	<	--	<	<	<	<	<	<	<	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	--	<	<	0.00	--	0.00	<	0.00	0.00	0.00	<	0.00	0.00	<	<	<
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	--	1066.57	1065.80	1066.27	Broken	1061.33	1063.61	1068.35	1071.36	1076.13	1070.54	1071.89	1073.90	1075.63	1073.88	1073.53
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.23	7.84	7.65	7.84	--	7.53	7.95	8.07	7.61	7.82	7.48	6.64	7.57	7.25	7.40	7.41
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	393	427	426	269	--	396	414	411	413	417	411	415	427	421	420	435
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	11.20	12.80	10.80	16.60	--	10.10	10.40	10.19	9.37	10.18	10.37	10.05	9.44	10.16	9.64	10.29

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-6			
		PAL	ES	3/16/21	9/14/21	3/14/22	9/13/22
VOCs (ug/L)							
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	<0.34	--	<0.34
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.38	--	<0.38
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.36	--	<0.36
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.27	--	<0.27
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.28	--	<0.28
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.49	--	<0.49
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	<0.41	--	<0.41
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	<0.43	--	<0.43
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	<0.35	--	<0.35
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	<0.50	--	<0.50
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.34	--	<0.34
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<0.49	--	<0.49
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.33	--	<0.33
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.69	--	<0.69
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.37	--	<0.37
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.30	--	<0.30
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	<0.28	--	<0.28
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	<0.31	--	<0.31
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<3.3	--	<3.3
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	<3.7	--	<3.7
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	<4.1	--	<4.1
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.47	--	<0.47
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.33	--	<0.33
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.26	--	<0.26
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.76	--	<0.76
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.72	--	<0.72
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	<0.34	--	<0.34
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	<0.33	--	<0.33
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	<0.27	--	<0.27
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	<0.83	--	<0.83
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.37	--	<0.37
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.37	--	<0.37
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<1.1	--	<1.1
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.46	--	<0.46
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<1.3	--	<1.3
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.41	--	<0.41
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.34	--	<0.34
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.36	--	<0.36
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.45	--	<0.45
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.63	--	<0.63
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<1.2	--	<1.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.26	--	<0.26
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.42	--	<0.42
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	398	3490	--	<0.41	--	<0.41
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.57	--	<0.57
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.39	--	<0.39
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.30	--	<0.30
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	<2.9	--	<2.9
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.28	--	<0.28
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.35	--	<0.35
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.34	--	<0.34
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.31	--	<0.31
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.36	--	<0.36
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.31	--	<0.31
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.33	--	<0.33
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.29	--	<0.29
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.33	--	<0.33
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.55	--	<0.55
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	<3.4	--	<3.4
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.27	--	<0.27
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.35	--	<0.35
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.57	--	<0.57
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.50	--	<0.50
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.39	--	<0.39
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.15	--	<0.15
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.74	--	<0.74
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.72	--	<0.72
INORGANICS							
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	200	190	190	210
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	9.70	7.70	8.40	9.50
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	236	209	251	244
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	6.00	5.30	5.30	5.60
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--
FIELD PARAMETERS							
COMMENT, SAMPLE COLOR		NE	NE	<	<	<	<
COMMENT, SAMPLE ODOR		NE	NE	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	<	<	<	<
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1069.39	1067.35	1065.30	1063.84
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.25	7.20	7.15	7.21
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	443	424	419	460
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	9.99	10.21	10.59	10.05

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-10															
		PAL	ES	11/30/89	12/27/89	1/29/90	3/5/90	6/13/90	9/19/90	12/12/90	12/28/90	3/13/91	4/1/92	6/10/92	8/18/92	12/30/93	3/30/94	6/23/94	9/20/94
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	204	192	192	188	196	192	188	--	184	--	--	--	184	188	196	200
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	35.7	13.3	3.9	3.0	<	32.1	6.3	--	<	--	--	--	6.3	5.0	<	13.0
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	4.30	2.40	2.20	2.00	--	--	--	--	--	--	--	--	<	1.00	<	1.00
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	20	10	<	20	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	0.18	0.60	0.20	1.35	0.30	--	--	--	--	0.26	0.23	0.35	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	216	212	212	212	208	200	184	--	204	--	--	--	196	216	204	206
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	0.020	0.020	<	<	<	0.050	0.030	--	0.020	0.080	--	--	<	<	0.020	0.010
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	140	30	<	10	<	--	--	--	--	<	<	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	<	<	<	0.6	<	--	--	--	--	<	0.4	<	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	1.8	1.8	0.8	1.5	1.5	--	--	--	--	1.6	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	67	20	20	<	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1070.13	1069.70	1069.14	1068.64	--	--	--	--	--	--	--	--	1085.48	1081.00	1089.16	1217.45
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.68	7.62	7.65	7.79	--	--	--	--	--	--	--	--	7.85	8.00	7.77	7.46
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	252	323	310	314	336	390	328	323	343	336	369	433	319	340	362	364
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	5.00	--	--	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-10																
		PAL	ES	12/14/94	3/28/95	6/7/95	9/18/95	12/12/95	3/18/96	6/5/96	9/19/96	12/3/96	3/27/97	6/19/97	9/11/97	12/3/97	3/25/98	6/17/98	9/15/98
VOCs (ug/L)																				
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	<	--	--	--	<	--	--	--	<0.3	--	--	--	<0.3
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	<	--	--	--	<	--	--	--	<0.3	--	--	--	<0.3
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.3	--	--	--	<0.3
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	--	--	--	--	<0.1
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.4	--	--	--	<0.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	--	--	--	--	<0.1
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.1
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	<	--	--	--	<	--	--	--	<0.4	--	--	--	<0.4
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
INORGANICS																				
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	188	184	192	176	188	180	180	190	260	180	170	180	190	180	180	190
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	<	--	--	--	--	<5	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	15.6	9.2	3.4	6.1	120.0	<	<	3.4	1.5	11.8	<5	16.0	<2	6.2	< 2	< 2
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	<	2.00	2.00	3.00	2.00	2.00	<	2.00	3.60	4.00	5.70	3.60	3.50	2.90	2.93	4.30
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	0.11	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	187	174	178	180	190	180	190	190	200	190	180	180	190	190	190	200
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	0.018	0.008	0.010	0.020	<	0.018	0.019	<	0.0088	<0.006	<0.006	0.049	<0.006	<0.006	<18	<0.006
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	<	<	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																				
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	<	<	--	0.0	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	<	<	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1083.68	1217.45	1083.63	1083.08	1081.60	1081.47	1080.65	1081.36	1079.98	1079.02	1079.02	1078.91	1078.40	1078.20	1078.77	1084.33
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.79	7.57	7.93	7.87	8.14	7.96	7.87	7.65	7.25	7.76	9.33	7.19	7.88	7.85	7.91	8.63
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	345	406	352	350	339	345	491	353	377	354	314	343	355	332	325	306
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	12.00	11.00	--	--	--	--	3.30	11.30	15.40	12.60	7.30	11.60	12.70	17.80

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-10															
		PAL	ES	12/15/98	3/30/99	3/29/00	3/28/01	9/13/01	3/27/02	10/1/02	3/26/03	6/12/03	7/15/03	3/23/04	9/8/04	3/22/05	9/28/05	3/28/06	9/26/06
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--		--		--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	--	<0.2	--	<0.42	--	--	--	--	--	--	--	--	<0.2
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.2	--	<0.5	--	--	--	--	--	--	--	--	<0.1
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	--	<0.38	--	<0.36	--	--	--	--	--	--	--	--	<0.15
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	--	--	--	<0.39	--	--	--	--	--	--	--	--	<0.15
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	--	<0.15	--	<0.61	--	--	--	--	--	--	--	--	<0.35
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	--	<0.19	--	<1.1	--	--	--	--	--	--	--	--	<0.1
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.28	--	<0.17	--	--	--	--	--	--	--	--	<0.1
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.35	--	<0.25	--	--	--	--	--	--	--	--	<0.1
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<6.5
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.16	--	<0.31	--	--	--	--	--	--	--	--	<0.15
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	--	<0.2	--	<0.83	--	--	--	--	--	--	--	--	<0.1
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	--	<0.15	--	<0.57	--	--	--	--	--	--	--	--	<0.15
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.2
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.3	--	<0.59	--	--	--	--	--	--	--	--	<0.2
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	--	<0.17	--	<0.31	--	--	--	--	--	--	--	--	<0.1
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	--	<0.25	--	<0.44	--	--	--	--	--	--	--	--	<0.6
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	--	<0.24	--	<0.27	--	--	--	--	--	--	--	--	<0.1
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	--	<0.15	--	<0.29	--	--	--	--	--	--	--	--	<0.2
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	--	<0.25	--	<0.23	--	--	--	--	--	--	--	--	<0.2
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.3	--	<0.26	--	--	--	--	--	--	--	--	<0.1
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	--	<0.22	--	<0.87	--	--	--	--	--	--	--	--	<0.1
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.15	--	<3	--	--	--	--	--	--	--	--	<0.1
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	<0.25	--	<0.46	--	--	--	--	--	--	--	--	<0.25
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.3	--	<0.51	--	--	--	--	--	--	--	--	<0.4
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	--	<0.5	--	<0.5	--	--	--	--	--	--	--	--	0.1
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	--	<0.15	--	<0.7	--	--	--	--	--	--	--	--	<0.2
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	--	<0.28	--	<0.29	--	--	--	--	--	--	--	--	<0.15
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	--	<0.3	--	<0.3	--	--	--	--	--	--	--	--	<0.1
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	<0.8	--	<0.8	--	--	--	--	--	--	--	--	<1
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	--	<0.36	--	<0.51	--	--	--	--	--	--	--	--	<0.75
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	--	<0.27	--	<0.3	--	--	--	--	--	--	--	--	<0.75
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	<0.18	--	<0.29	--	--	--	--	--	--	--	--	<0.1
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.26	--	<0.32	--	--	--	--	--	--	--	--	<0.1
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.7
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	--	<0.4	--	<0.3	--	--	--	--	--	--	--	--	<0.4
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	--	<0.25	--	<0.39	--	--	--	--	--	--	--	--	<0.1
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<0.18	--	<0.25	--	--	--	--	--	--	--	--	<0.1
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	--	<0.17	--	<0.71	--	--	--	--	--	--	--	--	<0.2
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	<0.26	--	<0.36	--	--	--	--	--	--	--	--	<0.2
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	<0.39	--	<0.2	--	--	--	--	--	--	--	--	<0.15
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	<0.4	--	<0.62	--	--	--	--	--	--	--	--	<0.4
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	<0.17	--	<0.3	--	--	--	--	--	--	--	--	<0.1
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	190	--	--	221	195	190	196	190	--	--	--	--	--	--	--	220
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	4.3	--	--	16.0	<3	13	<3	<3	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	2.90	--	--	6.19	5.87	5.82	6.57	7.71	--	--	--	--	--	--	--	6.53
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	--	--	--	195	202	220	204	203	--	--	--	--	--	--	--	224
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	<0.006	--	--	0.081	<0.003	<0.003	<0.003	<0.003	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.06
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	--	1082.42	1080.94	1082.73	1088.42	1083.50	1080.40	--	1077.10	1076.57	1073.27	Broken	1075.54	1073.21	1070.89	1070.04
PH, FIELD (STANDARD UNITS)	SU	NE	NE	6.86	--	--	8.23	6.35	7.30	7.34	7.84	--	--	--	--	--	--	--	--
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	342	--	--	404	365	353	313	379	--	--	--	--	--	--	--	--
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	9.60	--	--	10.90	11.70	11.30	11.80	10.70	--	--	--	--	--	--	--	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-10															
		PAL	ES	3/26/07	9/26/07	3/19/08	9/15/08	3/30/09	9/16/09	3/30/10	9/22/10	3/30/11	9/21/11	4/4/12	9/26/12	4/4/13	9/24/13	4/30/14	9/26/14
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.25	--	<0.25
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.2	--	<0.2	--	<0.5	--	<0.5	--	<0.9	--	<0.9	--	<0.2	--	<0.2
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.23	--	<0.23
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	<0.42	--	<0.42	--	<0.28	--	<0.28
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--	<0.75	--	<0.75	--	<0.19	--	<0.19
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.57	--	<0.57	--	<0.31	--	<0.31
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.34	--	<0.34
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.24	--	<0.24
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.45	--	<0.45
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.31	--	<0.31
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.14	--	<0.14
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<1	--	<1.3	--	<1.3	--	<1.3	--	<1.7	--	<1.7	--	<0.87	--	<0.87
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.2	--	<0.3	--	<0.3	--	<0.3	--	<0.56	--	<0.56	--	<0.36	--	<0.36
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.3	--	<0.3	--	<0.3	--	<0.36	--	<0.36	--	<0.28	--	<0.28
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	<0.49	--	<0.49	--	<0.2	--	<0.2
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.18	--	<0.18
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.13	--	<0.13
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.32	--	<0.32
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--	<5	--	<5	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.41	--	<0.41	--	0.19	--	<0.074
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.25	--	<0.25
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.4	--	<0.4
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.2	--	<0.4	--	<0.4	--	<0.4	--	<0.56	--	<0.56	--	<0.17	--	<0.17
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<1	--	<1	--	<1	--	<1	--	<0.91	--	<0.91	--	<0.31	--	<0.31
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.13	--	<0.13
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.15	--	<0.15
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.14	--	<0.14
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	<1	--	<1	--	<1	--	<1	--	<0.66	--	<0.66	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.3	--	<0.3	--	<0.3	--	<0.49	--	<0.49	--	<0.26	--	<0.26
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.41	--	<0.41	--	<0.14	--	<0.14
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<0.6	--	<0.6	--	<0.7	--	<0.7	--	<0.97	--	<0.97	--	<0.34	--	<0.34
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<1.3	--	<1.3	--	<0.2	--	<0.2
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.3	--	<0.4	--	<0.4	--	<0.4	--	<0.24	--	<0.24	--	<0.18	--	<0.18
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	<0.83	--	<0.83	--	<0.12	--	<0.12
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.18	--	<0.18
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--	<0.81	--	<0.81	--	<0.32	--	<0.32
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	<0.6	--	<0.6	--	<0.33	--	<0.33
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.3	--	<0.3	--	<0.3	--	<0.3	--	<0.99	--	<0.99	--	<0.2	--	<0.2
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.43	--	<0.43	--	<0.68	--	<0.68
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.15	--	<0.15
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	<0.54	--	<0.54	--	<0.13	--	<0.13
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	<0.2	--	<0.2	--	<0.3	--	<0.3	--	<0.79	--	<0.79	--	<0.19	--	<0.19
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.26	--	<0.26
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.14	--	<0.14
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.87	--	<0.87	--	<0.15	--	<0.15
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	<2	--	<2	--	<2	--	<2	--	<4.3	--	<4.3	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.2	--	<0.5	--	<0.5	--	<0.5	--	<0.61	--	<0.61	--	<0.24	--	<0.24
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<1	--	<1	--	<1	--	<1	--	<0.89	--	<0.89	--	<0.16	--	<0.16
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.13	--	<0.13
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.21	--	<0.21
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.8	--	<0.8	--	<0.8	--	<0.8	--	<0.83	--	<0.83	--	<0.27	--	<0.27
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.2	--	<0.2
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.8	--	<0.8	--	<0.8	--	<0.8	--	<0.95	--	<0.95	--	<0.15	--	<0.15
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.17	--	<0.17
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.86	--	<0.86	--	<0.1	--	<0.1
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.3	--	<0.3	--	<0.3	--	<0.3	--	<0.45	--	<0.45	--	<0.17	--	<0.17
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	<1	--	<1	--	<2	--	<2	--	<1.7	--	<1.7	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.67	--	<0.67	--	2	--	0.77
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.2	--	<0.2	--	<0.5	--	<0.5	--	<0.89	--	<0.89	--	<0.25	--	<0.25
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.4	--	<0.4	--	<0.4	--	<0.19	--	<0.19	--	<0.21	--	<0.21
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.94	--	<0.94	--	<0.28	--	<0.28
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.4	--	<0.4	--	<0.4	--	<0.48	--	<0.48	--	<0.19	--	<0.19
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.18	--	<0.18	--	<0.1	--	<0.1
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<2.6	--	<2.6	--	0.45	--	<0.068
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	--	--	--	--	--	--	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	221	278	246	226	210	214	206	222	218	206	209	195	200	200	--	160
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	6.57	7.05	6.54	6.02	5.64	5.30	5.46	5.73	4.85	5.70	6.20	6.40	6.50	6.50	--	7.40
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	227	228	254	235	223	222	222	226	217	225	205	209	202	230	--	220
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	6.18	7.24	6.80	7.97	7.54	6.72	6.42	6.77	5.73	6.70	6.50	6.20	5.40	5.80	--	5.60
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	0.0	0.0	0.0	--	--	--	--	--	--	--	0.0	<	--	<
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	0.0	0.0	0.0	--	--	--	--	--	--	--	0.0	<	--	<
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1069.91	1027.77	1084.45	1098.31	1089.77	1083.76	1080.22	1091.30	1091.77	1092.81	1085.37	1081.19	1078.57	1085.97	1084.74	1085.43
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.62	--	7.72	7.30	8.21	7.57	7.84	7.75	7.53	7.41	7.12	7.79	7.46	7.86	--	7.93
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	434	--	402	392	391	426	418	427	404	414	404	403	379	432	--	330
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	11.50	--	10.40	12.00	11.50	11.80	12.60	11.40	10.20	12.40	10.60	11.10	11.40	12.60	--	16.40

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Groundwater Analytical Results
MW-10

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-10															
		PAL	ES	3/24/15	9/15/15	3/29/16	9/21/16	3/13/17	9/11/17	3/14/18	9/10/18	3/11/19	9/9/19	3/9/20	9/14/20	3/15/21	9/13/21	3/14/22	9/12/22
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.40	--	<0.40	--	<0.34	--	<0.34
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.29	--	<0.29	--	<0.38	--	<0.38
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.30	--	<0.30	--	<0.36	--	<0.36
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--	<0.27	--	<0.27
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.28	--	<0.28
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.49	--	<0.49
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.30	--	<0.30	--	<0.41	--	<0.41
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	<0.80	--	<0.80	--	<0.80	--	<0.80	--	<0.23	--	<0.23	--	<0.43	--	<0.43
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.35	--	<0.35
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.28	--	<0.28	--	<0.50	--	<0.50
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.29	--	<0.29	--	<0.34	--	<0.34
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.25	--	<0.25	--	<0.49	--	<0.49
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.33	--	<0.33
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.26	--	<0.26	--	<0.26	--	<0.26	--	<0.24	--	<0.24	--	<0.69	--	<0.69
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.18	--	<0.18	--	<0.37	--	<0.37
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.27	--	<0.27	--	<0.30	--	<0.30
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.17	--	<0.17	--	<0.28	--	<0.28
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.31	--	<0.31
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<7.0	--	<7.0	--	<7.0	--	<7.0	--	<3.0	--	<3.0	--	<3.3	--	<3.3
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	<6.0	--	<6.0	--	<6.0	--	<6.0	--	<2.2	--	<2.2	--	<3.7	--	<3.7
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	<9.0	--	<9.0	--	<9.0	--	<9.0	--	<4.0	--	<4.0	--	<4.1	--	<4.1
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.24	--	<0.24	--	<0.24	--	<0.24	--	<0.40	--	<0.40	--	<0.47	--	<0.47
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.40	--	<0.40	--	<0.33	--	<0.33
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.80	--	<0.80	--	<0.80	--	<0.80	--	<0.30	--	<0.30	--	<0.26	--	<0.26
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.29	--	<0.29	--	<0.76	--	<0.76
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.90	--	<0.90	--	<0.72	--	<0.72
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.29	--	<0.29	--	<0.34	--	<0.34
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.33	--	<0.33
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.27	--	<0.27
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.60	--	<0.60	--	<0.83	--	<0.83
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.37	--	<0.37
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.37	--	<0.37
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<1.1	--	<1.1
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.46	--	<0.46
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.60	--	<0.60	--	<1.3	--	<1.3
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.41	--	<0.41
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.16	--	<0.16	--	<0.34	--	<0.34
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--	<0.36	--	<0.36
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.80	--	<0.80	--	<0.80	--	<0.80	--	<0.22	--	<0.22	--	<0.45	--	<0.45
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.63	--	<0.63
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.40	--	<0.40	--	<1.2	--	<1.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.29	--	<0.29	--	<0.29	--	<0.29	--	<0.40	--	<0.40	--	<0.26	--	<0.26
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.42	--	<0.42
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.40	--	<0.40	--	<0.41	--	<0.41
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.90	--	<0.90	--	<0.90	--	<0.90	--	<0.40	--	<0.40	--	<0.57	--	<0.57
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--	<0.39	--	<0.39
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.26	--	<0.26	--	<0.30	--	<0.30
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	<4.0	--	<4.0	--	<4.0	--	<4.0	--	<2.6	--	<2.6	--	<2.9	--	<2.9
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.28	--	<0.28
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.30	--	<0.30	--	<0.35	--	<0.35
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.34	--	<0.34
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.25	--	<0.25	--	<0.31	--	<0.31
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.36	--	<0.36
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--	<0.31	--	<0.31
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.33	--	<0.33
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.29	--	<0.29
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.29	--	<0.29	--	<0.33	--	<0.33
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.27	--	<0.27	--	<0.55	--	<0.55
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	<3.0	--	<3.0	--	<3.0	--	<3.0	--	<3.0	--	<3.0	--	<3.4	--	<3.4
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.21	--	<0.21	--	<0.27	--	<0.27
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.35	--	<0.35
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.23	--	<0.23	--	<0.57	--	<0.57
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.40	--	<0.40	--	<0.50	--	<0.50
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.39	--	<0.39
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.19	--	<0.19	--	<0.19	--	<0.19	--	<0.14	--	<0.14	--	<0.15	--	<0.15
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.70	--	<0.70	--	<0.74	--	<0.74
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.26	--	<0.26	--	<0.72	--	<0.72
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	190	200	210	210	220	230	230	240	210	220	230	240	240	250	240	230
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	8.00	7.70	8.90	7.60	8.90	11.00	9.40	8.90	10.00	11.00	9.60	11.00	12.00	11.00	10.00	10.00
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	216	218	203	206	191	204	204	220	233	220	234	250	268	263	312	271
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	6.30	5.70	6.10	6.60	6.40	6.60	5.00	6.10	6.70	6.90	6.90	7.40	7.40	6.90	7.80	8.00
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	--	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1080.78	1078.18	1080.59	1087.69	1093.68	1101.39	1092.78	1092.99	1097.75	1099.58	1098.09	1096.89	1090.39	1086.65	1084.18	1082.08
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.51	7.67	7.96	8.15	7.81	7.76	7.42	6.52	7.44	7.43	7.38	7.40	7.21	7.27	7.24	7.37
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	471	403	413	429	410	428	421	436	444	455	468	497	510	530	515	508
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	10.80	10.40	10.40	10.18	9.22	10.25	9.68	10.05	9.34	10.18	9.96	10.30	9.42	10.25	10.41	10.21

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-11															
		PAL	ES	11/30/89	12/27/89	1/29/90	3/5/90	6/13/90	9/19/90	12/12/90	12/28/90	3/13/91	4/1/92	6/10/92	8/18/92	12/30/93	3/30/94	6/23/94	9/20/94
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	212	212	216	208	204	228	236	--	224	--	--	--	184	212	208	184
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	60	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	6.5	38.0	6.9	7.6	<	<	6.8	--	25.6	--	--	--	56.5	6.0	25.6	4.5
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	32.50	18.00	8.70	6.00	--	--	--	--	--	--	--	--	3.00	1.00	2.00	1.00
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	20	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	0.49	0.68	3.00	1.55	0.40	--	--	--	--	0.35	0.23	0.35	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	216	220	232	220	240	236	246	--	236	--	--	--	188	224	220	216
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	0.070	<	0.040	0.090	0.050	0.020	0.060	--	0.020	0.030	--	--	<	<	<	<
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	<	<	2	<	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	140	110	90	40	<	--	--	--	--	<	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	<	<	<	<	0.3	--	--	--	--	<	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	0.6	0.6	1.3	1.0	1.2	--	--	--	--	1.5	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	188	20	20	<	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1072.83	1072.51	1071.98	1071.37	--	--	--	--	--	--	--	--	1098.86	1095.00	1093.18	1218.54
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.89	7.87	8.24	7.97	--	--	--	--	--	--	--	--	7.87	8.00	7.67	7.54
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	371	370	327	353	382	451	408	371	398	377	362	486	357	379	401	388
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	7.00	--	--	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Groundwater Analytical Results
MW-11

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-11															
		PAL	ES	12/14/94	3/28/95	6/7/95	9/18/95	12/12/95	3/18/96	6/5/96	9/19/96	12/3/96	3/27/97	6/19/97	9/11/97	12/3/97	3/25/98	6/17/98	9/15/98
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	<	--	--	--	<	--	--	--	<0.3	--	--	--	<0.3
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	<	--	--	--	<	--	--	--	<0.3	--	--	--	<0.3
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.3	--	--	--	<0.3
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	--	--	--	--	<0.1
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.4	--	--	--	<0.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	--	--	--	--	<0.1
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--		--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--		--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	<	--	--	--	0.1	--	--	--	<0.2	--	--	--	<0.2
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	<	--	--	--	<	--	--	--	<0.4	--	--	--	<0.4
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	<	--	--	--	<	--	--	--	<0.2	--	--	--	<0.2
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	<	--	--	--	<	--	--	--	<0.1	--	--	--	<0.1
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	188	176	184	168	160	180	170	170	260	190	180	190	190	190	180	180
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	29.4	--	<	3.1	<	7.4	<	<	<1.0	11.8	5.0	3.2	<2	< 2	< 2	< 2
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	1.00	2.00	2.00	3.00	3.00	9.00	<	2.00	3.80	3.50	4.00	6.00	3.10	2.40	< 1	2.90
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	0.15	0.14	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	190	172	191	180	180	180	190	190	200	190	180	190	190	190	190	190
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	<	0.045	0.080	0.040	0.015	0.016	0.020	0.085	0.039	0.030	0.020	0.084	0.007	0.029	0.022	0.007
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	8.9	3.4	3.1	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	<	0.0	--	--	0.0	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	<	<	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	0.0	0.0	--	--	--	0.0	--	--	--	--	--	--	--	--	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1088.32	1218.54	1087.85	1087.54	1085.90	1085.21	1084.63	1085.61	1083.94	1082.75	1082.40	1082.09	1081.59	1081.48	1082.08	1088.45
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.60	7.57	7.84	7.87	8.42	7.98	7.92	7.79	7.29	7.60	8.75	7.25	7.87	7.83	7.96	8.45
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	354	392	388	356	303	333	343	394	453	348	318	327	351	336	343	321
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	7.50	12.00	11.00	--	--	--	--	4.20	12.20	12.20	11.40	7.80	11.00	12.90	16.30

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-11															
		PAL	ES	12/15/98	3/30/99	6/17/99	9/28/99	12/29/99	3/29/00	9/20/00	3/28/01	9/13/01	3/27/02	10/1/02	3/26/03	9/24/03	3/24/04	9/7/04	3/22/05
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	<0.19	--	--	<0.32	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	<0.3	--	--	<0.13	--	<0.2	--	<0.42	--	<0.42	--	<0.42	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<0.52	--	--	<0.52	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.2	--	--	<0.2	--	<0.2	--	<0.5	--	<0.5	--	<0.5	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	<0.15	--	--	<0.1	--	<0.38	--	<0.36	--	<0.36	--	<0.5	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	<0.11	--	--	<0.18	--	<0.38	--	<0.39	--	<0.39	--	<0.5	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	<0.25	--	--	<0.2	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	<0.052	--	--	<0.084	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	<0.99	--	--	<0.092	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	<0.05	--	--	<0.15	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<0.46	--	--	<0.12	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	<0.23	--	--	<0.17	--	<0.15	--	<0.61	--	<0.61	--	<1.3	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	<0.4	--	--	<0.2	--	<0.19	--	<1.1	--	<1.1	--	<1.1	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.35	--	--	<0.35	--	<0.28	--	<0.17	--	<0.17	--	<0.4	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.094	--	--	<0.27	--	<0.35	--	<0.25	--	<0.25	--	<0.4	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	<0.35	--	--	<0.11	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	<0.26	--	--	<0.12	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	<0.78	--	--	<0.26	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.19	--	--	<0.19	--	<0.16	--	<0.31	--	<0.31	--	<0.31	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.34	--	--	<0.34	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.17	--	--	<0.18	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	<0.25	--	--	<0.25	--	<0.2	--	<0.83	--	<0.83	--	<0.83	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	<0.34	--	--	<0.59	--	<0.15	--	<0.57	--	<0.57	--	<0.8	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	<0.04	--	--	<0.15	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	<0.35	--	--	<0.13	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	<0.28	--	--	<0.13	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.23	--	--	<0.23	--	<0.3	--	<0.59	--	<0.59	--	<0.5	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	<0.096	--	--	<0.12	--	<0.17	--	<0.31	--	<0.31	--	<0.7	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	<0.5	--	--	<0.28	--	<0.25	--	<0.44	--	<0.44	--	<1	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	<0.18	--	--	<0.18	--	<0.24	--	<0.27	--	<0.27	--	<0.4	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	<0.21	--	--	<0.13	--	<0.15	--	<0.29	--	<0.29	--	<0.29	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	<0.19	--	--	<0.19	--	<0.25	--	<0.23	--	<0.23	--	<0.4	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.096	--	--	<0.096	--	<0.3	--	<0.26	--	<0.26	--	<0.5	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	<0.19	--	--	<0.088	--	<0.22	--	<0.87	--	<0.87	--	<0.87	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.33	--	--	<0.052	--	<0.15	--	<3	--	<3	--	<3	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	<0.27	--	--	<0.21	--	<0.25	--	<0.46	--	<0.46	--	<0.7	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.25	--	--	<0.12	--	<0.3	--	<0.51	--	<0.51	--	<0.5	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.4	--	--	<0.4	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	<0.19	--	--	<0.30	--	<0.5	--	<0.5	--	<0.5	--	<0.5	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	<0.49	--	--	<0.34	--	<0.15	--	<0.7	--	<0.7	--	<1	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.074	--	--	<0.21	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.23	--	--	<0.12	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	<0.49	--	--	<0.11	--	<0.28	--	<0.29	--	<0.29	--	<0.5	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	<0.73	--	--	<0.13	--	<0.3	--	<0.3	--	<0.3	--	<0.3	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<0.082	--	--	<0.082	--	<0.8	--	<0.8	--	<0.8	--	<0.8	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.36	--	--	<0.11	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.25	--	--	<0.092	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	<0.036	--	--	<0.036	--	<0.36	--	<0.51	--	<0.51	--	<0.6	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.65	--	--	<0.17	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	<0.45	--	--	<0.11	--	<0.27	--	<0.3	--	<0.3	--	<0.6	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.12	--	--	<0.094	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	<0.084	--	--	<0.12	--	<0.18	--	<0.29	--	<0.29	--	<0.29	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.34	--	--	<0.14	--	<0.26	--	<0.32	--	<0.32	--	<0.45	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	<0.11	--	--	<0.11	--	5.61	--	<0.3	--	<0.3	--	<0.3	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	<0.21	--	--	<0.17	--	<0.25	--	<0.39	--	<0.39	--	<0.39	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	<0.14	--	--	<0.14	--	<0.18	--	<0.25	--	<0.25	--	<0.25	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	<0.45	--	--	<0.088	--	<0.17	--	<0.71	--	<0.71	--	<0.44	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	<0.21	--	--	<0.098	--	<0.26	--	<0.36	--	<0.36	--	<0.5	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	<0.14	--	--	<0.23	--	<0.39	--	<0.2	--	<0.2	--	<0.2	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	<0.39	--	--	--	--	<0.4	--	<0.62	--	<0.62	--	<0.62	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	<0.18	--	--	<0.13	--	<0.17	--	<0.3	--	<0.3	--	<0.3	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	190	--	200	180	180	190	180	196	198	200	203	210	197	212	202	204
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	< 2	--	3.1	<2	<2	<2	18.0	10.1	11.3	<3	<3	<3	19.2	<	<	<
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	2.90	--	3.40	4.50	4.90	4.00	4.00	5.69	6.20	5.86	6.77	7.52	5.60	5.12	5.07	4.64
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	190	--	200	190	190	190	200	202	215	230	204	203	212	215	212	209
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	0.057	--	<0.006	0.150	0.054	0.047	0.007	<0.01	0.074	0.059	<0.003	0.015	0.178	<	<	<
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	0.0	0.0	0.0	0.0	--	0.0	--	0.0	0.0	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	--	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--	0.0	--	0.0	0.0	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1088.42	1086.67	--	1088.95	--	--	1090.15	1086.62	1091.21	1087.73	1084.95	1081.90	1079.40	1076.59	1078.81	1079.06
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	--	7.81	7.92	7.35	7.77	7.35	8.45	--	7.39	7.26	7.70	6.95	--	6.93	7.74
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	--	--	369	342	359	--	283	342	389	381	366	379	386	--	456	440
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	14.20	11.20	10.40	--	15.30	9.80	11.50	12.30	11.30	9.40	9.50	--	9.90	7.90

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-11															
		PAL	ES	9/28/05	3/29/06	9/26/06	3/26/07	9/26/07	3/19/08	9/15/08	3/30/09	9/16/09	3/30/10	9/22/10	3/30/11	9/21/11	4/4/12	9/26/12	4/4/13
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.5	--	<0.5	--	<0.9	--	<0.9	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	<0.42	--	<0.42	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--	<0.75	--	<0.75	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.15	--	<0.15	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.57	--	<0.57	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	<0.3	--	<0.3	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<0.3	--	<0.35	--	<1	--	<1.3	--	<1.3	--	<1.3	--	<1.7	--	<1.7	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.5	--	<0.5	--	<0.56	--	<0.56	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.3	--	<0.3	--	<0.36	--	<0.36	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	<0.49	--	<0.49	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	<6.5	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--	<5	--	<5	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.41	--	<0.41	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.1	--	<0.1	--	<0.2	--	<0.4	--	<0.4	--	<0.4	--	<0.56	--	<0.56	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.15	--	<0.15	--	<1	--	<1	--	<1	--	<1	--	<0.91	--	<0.91	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	<0.2	--	<0.2	--	<1	--	<1	--	<1	--	<1	--	<0.66	--	<0.66	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.3	--	<0.3	--	<0.49	--	<0.49	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.41	--	<0.41	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<0.6	--	<0.6	--	<0.6	--	<0.6	--	<0.7	--	<0.7	--	<0.97	--	<0.97	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<1.3	--	<1.3	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.2	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	<0.4	--	<0.24	--	<0.24	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	<0.83	--	<0.83	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--	<0.81	--	<0.81	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.1	--	<0.1	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.25	--	<0.25	--	<0.3	--	<0.3	--	<0.3	--	<0.3	--	<0.99	--	<0.99	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.43	--	<0.43	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<0.1	--	0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	<0.54	--	<0.54	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.3	--	<0.3	--	<0.79	--	<0.79	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.87	--	<0.87	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	<2	--	<2	--	<2	--	<2	--	<2	--	<2	--	<4.3	--	<4.3	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.1	--	<0.1	--	<0.2	--	<0.5	--	--	--	--	--	<0.61	--	<0.61	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<1	--	<1	--	<1	--	<1	--	<1	--	<1	--	<0.89	--	<0.89	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.75	--	<0.75	--	<0.8	--	<0.8	--	<0.8	--	<0.8	--	<0.83	--	<0.83	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.75	--	<0.75	--	<0.8	--	<0.8	--	<0.8	--	<0.8	--	<0.95	--	<0.95	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.86	--	<0.86	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.1	--	<0.1	--	<0.3	--	<0.3	--	<0.3	--	<0.3	--	<0.45	--	<0.45	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	<0.7	--	<0.7	--	<1	--	<1	--	<2	--	<2	--	<1.7	--	<1.7	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.4	--	<0.4	--	<0.4	--	0.46	--	<0.4	--	<0.4	--	<0.67	--	<0.67	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.5	--	<0.5	--	<0.89	--	<0.89	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.1	--	<0.1	--	<0.2	--	<0.4	--	<0.4	--	<0.4	--	<0.19	--	<0.19	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.94	--	<0.94	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.2	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--	<0.4	--	<0.48	--	<0.48	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.15	--	<0.15	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.18	--	<0.18	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<2.6	--	<2.6	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.6	--	<0.6	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	199	235	255	262	314	270	234	232	238	215	231	218	210	194	195	200
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	4.27	5.56	6.96	7.77	8.05	6.36	6.55	6.10	5.99	5.56	5.79	5.08	5.90	6.30	6.50	6.50
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	209	232	253	272	265	266	245	255	298	735	281	265	245	213	298	207
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	5.12	5.97	6.40	6.99	7.43	7.78	7.56	8.66	7.01	6.08	6.20	6.15	6.80	6.80	6.20	5.60
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	0.0	0.0	0.0	0.0	--	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	0.0	0.0	0.0	--	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1076.79	1074.11	1073.32	1072.63	1079.63	1088.60	1103.38	1093.94	1088.17	1084.29	1096.13	1096.22	1097.69	1090.14	1085.99	1082.32
PH, FIELD (STANDARD UNITS)	SU	NE	NE	8.01	7.76	--	7.81	--	7.81	7.63	8.26	7.56	7.73	7.81	7.66	7.56	7.51	7.69	7.81
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	426	475	--	509	--	431	402	420	444	426	417	405	418	410	415	393
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	9.40	7.10	--	12.60	--	9.10	13.60	11.60	14.10	15.10	12.70	10.90	14.10	12.10	12.10	11.00

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date															
				MW-11															
		PAL	ES	9/24/13	4/30/14	9/26/14	3/25/15	9/15/15	3/29/16	9/21/16	3/13/17	9/11/17	3/14/18	9/10/18	3/11/19	9/9/19	3/9/20	9/14/20	3/15/21
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	<0.25	--	<0.25	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.40	--	<0.40	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.2	--	<0.2	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.29	--	<0.29	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	<0.23	--	<0.23	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.30	--	<0.30	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.28	--	<0.28	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.19	--	<0.19	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.31	--	<0.31	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	<0.34	--	<0.34	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.30	--	<0.30	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	<0.24	--	<0.24	--	<0.80	--	<0.80	--	<0.80	--	<0.80	--	<0.23	--	<0.23	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	<0.45	--	<0.45	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	<0.31	--	<0.31	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.28	--	<0.28	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<0.14	--	<0.14	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.29	--	<0.29	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<0.87	--	<0.87	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.25	--	<0.25	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<0.36	--	<0.36	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.28	--	<0.28	--	<0.26	--	<0.26	--	<0.26	--	<0.26	--	<0.24	--	<0.24	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.2	--	<0.2	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.18	--	<0.18	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<0.18	--	<0.18	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.27	--	<0.27	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	<0.13	--	<0.13	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.17	--	<0.17	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	<0.32	--	<0.32	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	<7.0	--	<7.0	--	<7.0	--	<7.0	--	<3.0	--	<3.0	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	<6.0	--	<6.0	--	<6.0	--	<6.0	--	<2.2	--	<2.2	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	<9.0	--	<9.0	--	<9.0	--	<9.0	--	<4.0	--	<4.0	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	0.22	--	<0.074	--	<0.24	--	<0.24	--	<0.24	--	<0.24	--	<0.40	--	<0.40	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.25	--	<0.25	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.40	--	<0.40	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.4	--	<0.4	--	<0.80	--	<0.80	--	<0.80	--	<0.80	--	<0.30	--	<0.30	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.17	--	<0.17	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.29	--	<0.29	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.31	--	<0.31	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.90	--	<0.90	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	<0.13	--	<0.13	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.29	--	<0.29	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	<0.15	--	<0.15	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	<0.14	--	<0.14	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	127.43	--	<0.12	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.60	--	<0.60	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.26	--	<0.26	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.14	--	<0.14	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<0.34	--	<0.34	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<0.2	--	<0.2	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.18	--	<0.18	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.60	--	<0.60	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.12	--	<0.1	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.18	--	<0.18	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.16	--	<0.16	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.32	--	<0.32	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.33	--	<0.33	--	<0.80	--	<0.80	--	<0.80	--	<0.80	--	<0.22	--	<0.22	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.2	--	<0.2	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.68	--	<0.68	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.40	--	<0.40	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.15	--	<0.15	--	<0.29	--	<0.29	--	<0.29	--	<0.29	--	<0.40	--	<0.40	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	0.23	--	<0.13	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<0.19	--	<0.19	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.40	--	<0.40	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.26	--	<0.26	--	<0.90	--	<0.90	--	<0.90	--	<0.90	--	<0.40	--	<0.40	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.14	--	<0.14	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.15	--	<0.15	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.26	--	<0.26	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	<4.0	--	<4.0	--	<4.0	--	<4.0	--	<2.6	--	<2.6	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.24	--	<0.24	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.16	--	<0.16	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.30	--	<0.30	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.13	--	<0.13	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.21	--	<0.21	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.25	--	<0.25	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.27	--	<0.27	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.2	--	<0.2	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.15	--	<0.15	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.17	--	<0.17	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.1	--	--	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.29	--	<0.29	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.17	--	<0.17	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.27	--	<0.27	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	<3.0	--	<3.0	--	<3.0	--	<3.0	--	<3.0	--	<3.0	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	2.3	--	0.79	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.21	--	<0.21	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.25	--	<0.25	--	<0.60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.21	--	<0.21	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.23	--	<0.23	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.28	--	<0.28	--	<0.70	--	<0.70	--	<0.70	--	<0.70	--	<0.40	--	<0.40	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.19	--	<0.19	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.1	--	<0.1	--	<0.19	--	<0.19	--	<0.19	--	<0.19	--	<0.14	--	<0.14	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	0.75	--	<0.068	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.70	--	<0.70	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.26	--	<0.26	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	210	170	160	200	210	230	230	240	240	260	250	220	220	240	250	240
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	6.20	7.40	7.60	7.70	6.60	8.00	7.00	7.60	9.80	7.60	7.00	8.60	8.40	6.20	6.80	6.70
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	660	220	220	233	226	212	219	206	213	222	236	235	224	241	248	257
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	6.20	6.10	6.10	7.00	6.20	5.70	7.10	6.60	7.10	5.50	6.30	6.60	6.30	6.30	6.40	6.50
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	0.0	<	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	<	--	<	--	<	<	<	<	<	<	<	<	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	<	<	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1091.13	1089.13	1090.60	1085.68	1082.83	1088.05	1090.48	1098.93	1106.85	1097.89	1095.62	1102.91	1104.98	1100.85	1102.01	1093.69
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.82	6.97	7.78	7.85	7.56	7.89	8.13	7.68	7.67	7.41	6.53	7.46	7.42	7.33	7.34	7.17
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	441	446	419	458	416	427	433	441	442	448	453	445	454	470	481	475
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	12.20	9.40	13.60	10.60	10.60	10.60	10.14	9.33	10.41	10.32	10.15	9.49	10.06	9.82	10.28	9.63

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Unit	NR 140 Standards		Well No./Sampling Date MW-11		
		PAL	ES	9/13/21	3/14/22	9/12/22
VOCs (ug/L)						
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	<0.34	--	<0.34
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.38	--	<0.38
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	<0.36	--	<0.36
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.27	--	<0.27
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.28	--	<0.28
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.49	--	<0.49
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	<0.41	--	<0.41
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	<0.43	--	<0.43
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	<0.35	--	<0.35
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	<0.50	--	<0.50
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<0.34	--	<0.34
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<0.49	--	<0.49
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<0.33	--	<0.33
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.69	--	<0.69
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.37	--	<0.37
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<0.30	--	<0.30
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	<0.28	--	<0.28
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	<0.31	--	<0.31
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<3.3	--	<3.3
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	<3.7	--	<3.7
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	<4.1	--	<4.1
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.47	--	<0.47
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.33	--	<0.33
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.26	--	<0.26
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.76	--	<0.76
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.72	--	<0.72
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	<0.34	--	<0.34
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	<0.33	--	<0.33
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	<0.27	--	<0.27
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	<0.83	--	<0.83
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.37	--	<0.37
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.37	--	<0.37
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<1.1	--	<1.1
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<0.46	--	<0.46
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<1.3	--	<1.3
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.41	--	<0.41
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.34	--	<0.34
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.36	--	<0.36
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.45	--	<0.45
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.63	--	<0.63
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<1.2	--	<1.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.26	--	<0.26
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<0.42	--	<0.42
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<0.41	--	<0.41
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.57	--	<0.57
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.39	--	<0.39
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.30	--	<0.30
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	<2.9	--	<2.9
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.28	--	<0.28
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.35	--	<0.35
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.34	--	<0.34
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.31	--	<0.31
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.36	--	<0.36
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.31	--	<0.31
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.33	--	<0.33
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.29	--	<0.29
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.33	--	<0.33
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.55	--	<0.55
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	<3.4	--	<3.4
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.27	--	<0.27
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.35	--	<0.35
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.57	--	<0.57
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.50	--	<0.50
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.39	--	<0.39
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.15	--	<0.15
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.74	--	<0.74
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.72	--	<0.72
INORGANICS						
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	230	240	230
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	6.40	8.40	8.40
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	245	304	261
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	6.30	7.50	7.50
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--
FIELD PARAMETERS						
COMMENT, SAMPLE COLOR		NE	NE	0.0	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1089.81	1089.22	1085.59
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.35	7.32	7.38
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	485	499	478
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	10.44	10.41	10.23

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Stanc

Analytical Parameters	Units	NR 140 Standards PAL	NR 140 Standards ES	Well No./Sampling Date MW-12 11/30/89	12/27/89	1/29/90	3/5/90	6/13/90	9/19/90	12/12/90	3/13/91	4/1/92	6/10/92	8/18/92	12/30/93	3/30/94	6/23/94	9/20/94	12/14/94
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
VINYL ACETATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	264	272	280	260	260	260	148	256	--	--	--	240	252	220	252	236
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	60	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	<	26.7	4.5	3.0	5.7	<	<	7.4	--	--	--	7.1	<	6.4	9.4	39.3
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	3.20	1.50	1.20	2.00	--	--	--	--	--	--	--	<	<	1.00	<	<
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	20	<	<	20	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	0.25	0.38	1.50	1.60	0.30	--	--	--	0.40	0.23	0.35	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	276	296	304	284	284	280	264	276	--	--	--	248	272	248	273	254
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	<	<	<	<	<	**0.3900**	0.0700	0.0200	0.0400	--	--	<	<	0.0200	0.0100	<
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	<	<	<	3	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	30	<	<	10	<	--	--	--	0.03	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	<	<	<	<	<	--	--	--	<	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	1.2	1.5	1.2	1.5	1.5	--	--	--	1.3	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	<	<	<	<	--	--	--	--	--	--	--	--	--	--	--	--
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	62	30	20	<	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1128.44	1128.29	1128.14	1128.00	--	--	--	--	--	--	--	1129.68	1128.00	1129.09	1128.89	1128.65
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.44	7.53	7.69	8.02	--	--	--	--	--	--	--	7.74	8.00	7.62	7.80	7.32
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	329	426	431	428	440	532	452	438	444	369	555	415	435	375	466	426
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	--	--	--	--	--	--	--	--	--	6.00	--	--	--	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analyticial Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-12															
		PAL	ES	3/28/95	6/7/95	9/18/95	10/23/95	12/12/95	3/18/96	6/5/96	9/19/96	12/3/96	3/27/97	6/19/97	9/11/97	12/3/97	3/25/98	6/17/98	9/15/98
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<	--	<	--	--	--	--	<	--	<0.3	--	<0.3	--	<0.3	--	<0.3
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<	--	<	--	--	--	--	<	--	<0.3	--	<0.3	--	<0.3	--	<0.3
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.3	--	<0.3	--	<0.3	--	<0.3
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	--	--	--	--	<0.1	--	<0.1
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<	--	<	--	--	--	--	<	--	<0.4	--	<0.4	--	<0.2	--	<0.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	--	--	--	--	<0.1	--	<0.1
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<	--	<	--	--	--	--	<	--	<0.1	--	--	--	--	--	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.1	--	<0.1
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<	--	<	--	--	--	--	<	--	<0.4	--	<0.4	--	<0.4	--	<0.4
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
VINYL ACETATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<	--	<	--	--	--	--	<	--	<0.2	--	<0.2	--	<0.2	--	<0.2
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<	--	<	--	--	--	--	<	--	<0.1	--	<0.1	--	<0.1	--	<0.1
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	236	240	240	--	244	250	240	240	350	260	240	260	240	240	230	240
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	<	--	<	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	<	--	<	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	<	5.5	6.6	--	<	<	3.6	<	5.7	11.8	5.0	<2	<2	16.0	3.4	3.7
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	11.00	1.00	<	--	<	<	<	1.00	1.60	1.90	3.60	2.00	2.00	<1	<1	<1
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	<	--	<	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	0.21	0.02	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	227	219	240	--	250	230	250	260	270	280	240	240	240	270	250	250
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	0.0310	0.0100	0.0400	--	<	0.0150	<	<	0.0089	0.0078	0.0100	<0.006	<0.006	<0.006	<18	<0.006
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	3	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	<	--	<	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	<	--	<	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	<	--	<	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--		--		--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	--	--	<	0.0	--	0.0	--	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	<	<	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	--	--	0.0	0.0	0.0	0.0	--	--	--	--	--	--	--	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1128.28	1128.28	1128.18	--	1128.14	1127.99	1127.87	1127.73	1127.72	1127.69	1127.73	1127.67	1127.05	1126.84	1127.91	1128.13
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.63	7.95	7.92	--	8.05	7.93	7.89	7.64	7.13	7.77	7.97	7.05	7.87	7.76	7.52	8.29
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	398	455	435	--	404	415	401	456	435	415	363	199	433	411	384	369
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	12.00	11.00	--	--	--	--	--	5.00	11.10	19.40	12.40	6.50	10.70	12.50	19.30

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analyticial Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-12															
		PAL	ES	12/15/98	3/30/99	6/17/99	9/28/99	12/29/99	3/29/00	9/20/00	3/28/01	9/13/01	3/27/02	10/1/02	3/26/03	6/12/03	7/15/03	9/24/03	3/24/04
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	<0.19	--	<0.19	--	<0.28	<0.092	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.3	--	<0.3	--	<0.21	<0.13	<0.15	--	<0.42	<0.42	<0.42	--	--	<0.42	<0.42
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.52	--	<0.52	--	<0.47	<0.52	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.2	--	<0.32	<0.2	<0.14	--	<0.5	<0.5	<0.5	--	--	<0.5	<0.5
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.15	--	<0.15	--	<0.31	<0.1	<0.15	--	<0.36	<0.36	<0.36	--	--	<0.36	<0.5
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.4	--	<0.11	--	<0.42	<0.18	<0.15	--	<0.39	<0.39	<0.39	--	--	<0.39	<0.5
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	<0.25	--	<0.25	--	<0.43	<0.13	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	<0.94	--	<0.052	--	<0.81	<0.052	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	<0.99	--	<0.99	--	<0.43	<0.094	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	<1.04	--	<0.05	--	<0.43	<0.15	<0.13	--	<0.29	<0.29	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.46	--	<0.46	--	<0.17	<0.12	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<1.46	--	<0.23	--	<0.38	<0.17	<0.25	--	<0.61	<0.61	<0.61	--	--	<0.61	<1.3
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.4	--	<0.4	--	<0.3	<0.084	<0.12	--	<1.1	<1.1	<1.1	--	--	<1.1	<1.1
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.35	--	<0.35	--	<0.17	<0.35	<0.15	--	<0.17	<0.17	<0.17	--	--	<0.17	<0.4
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.09	--	<0.094	--	<0.49	<0.27	<0.15	--	<0.25	<0.25	<0.25	--	--	<0.25	<0.4
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.35	--	<0.35	--	<0.13	<0.11	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	<0.26	--	<0.26	--	<0.22	<0.26	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	<0.78	--	<0.78	--	<0.27	<0.2	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.19	--	<0.19	--	<0.13	<0.19	<0.15	--	<0.31	<0.31	<0.31	--	--	<0.31	<0.31
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.34	--	<0.34	--	<0.39	<0.34	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.17	--	<0.17	--	<0.26	<0.17	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.25	--	<0.25	--	<0.2	<0.25	<0.13	--	<0.83	<0.83	<0.83	--	--	<0.83	<0.83
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.34	--	<0.34	--	<0.38	<0.59	<0.15	--	<0.57	<0.57	<0.57	--	--	<0.57	<0.8
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	<0.76	--	<0.04	--	<0.33	<0.18	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	<0.35	--	<0.35	--	<0.37	<0.15	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	<0.28	--	<0.28	--	<0.37	<0.13	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.23	--	<0.23	--	<0.53	<0.23	<0.15	--	<0.59	<0.59	<0.59	--	--	<0.59	<0.5
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	< 0.1	--	<0.096	--	<0.27	<0.12	<0.15	--	<0.31	<0.31	<0.31	--	--	<0.31	<0.7
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<0.5	--	<0.5	--	<0.63	<0.28	<0.15	--	<0.44	<0.44	<0.44	--	--	<0.44	<1
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.2	--	<0.18	--	<0.27	<0.18	<0.14	--	<0.27	<0.27	<0.27	--	--	<0.27	<0.4
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.24	--	<0.21	--	<0.53	<0.13	<0.15	--	<0.29	<0.29	<0.29	--	--	<0.29	<0.29
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.19	--	<0.19	--	<0.27	<0.19	<0.15	--	<0.23	<0.23	<0.23	--	--	<0.23	<0.4
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.1	--	<0.096	--	<0.44	<0.096	<0.12	--	<0.26	<0.26	<0.26	--	--	<0.26	<0.5
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.19	--	<0.19	--	<0.33	<0.088	<0.15	--	<0.87	<0.87	<0.87	--	--	<0.87	<0.87
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.33	--	<0.33	--	<0.32	<0.32	<0.15	--	<3	<3	<3	--	--	<3	<3
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.59	--	<0.27	--	<0.6	<0.21	<0.15	--	<0.46	<0.46	<0.46	--	--	<0.46	<0.7
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.44	--	<0.25	--	<0.26	<0.12	<0.39	--	<0.51	<0.51	<0.51	--	--	<0.51	<0.5
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.4	--	<0.4	--	<0.25	<0.4	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.19	--	<0.19	--	<0.21	<0.13	<0.50	--	<0.5	<0.5	<0.5	--	--	<0.5	<0.5
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	<0.89	--	<0.49	--	<0.55	<0.34	<0.15	--	<0.7	<0.7	<0.7	--	--	<0.7	<1
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.95	--	<0.074	--	<0.55	<0.21	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.23	--	<0.23	--	<0.35	<0.12	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	--	--	--	--	<0.18	<0.11	--	--	--	--	<0.29	--	--	<0.29	<0.5
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.73	--	<0.73	--	<0.26	<0.2	<0.30	--	<0.3	<0.3	<0.3	--	--	<0.3	<0.3
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.54	--	<0.082	--	<1.31	<0.082	<0.25	--	<0.8	<0.8	<0.8	--	--	<0.8	<0.8
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.36	--	<0.36	--	<0.3	<0.12	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.25	--	<0.25	--	<0.17	<0.11	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.38	--	<0.036	--	<0.36	<0.036	<0.15	--	<0.51	<0.51	<0.51	--	--	<0.51	<0.6
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.65	--	<0.65	--	<0.17	<0.092	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.45	--	<0.45	--	<0.31	<0.11	<0.15	--	<0.3	<0.3	<0.3	--	--	<0.3	<0.6
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.52	--	<0.12	--	<0.3	<0.13	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.08	--	<0.084	--	<0.46	<0.12	<0.15	--	<0.29	<0.29	<0.29	--	--	<0.29	<0.29
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.34	--	<0.34	--	<0.33	<0.14	<0.15	--	<0.32	<0.32	<0.32	--	--	<0.32	<0.45
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.11	--	<0.11	--	<0.32	<0.11	<0.40	--	<0.3	<0.3	<0.3	--	--	<0.3	<0.3
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.21	--	<0.21	--	<0.27	<0.17	<0.15	--	<0.39	<0.39	<0.39	--	--	<0.39	<0.39
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.14	--	<0.14	--	<0.41	<0.14	<0.80	--	<0.25	<0.25	<0.25	--	--	<0.25	<0.25
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.45	--	<0.45	--	<0.3	<0.088	<0.11	--	<0.71	<0.71	<0.71	--	--	<0.71	<0.44
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.21	--	<0.21	--	<0.26	<0.098	<0.40	--	<0.36	<0.36	<0.36	--	--	<0.36	<0.5
VINYL ACETATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.31	--	<0.14	--	<0.54	<0.23	<0.11	--	<0.2	<0.2	<0.2	--	--	<0.2	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.39	--	<0.39	--	<0.44	<0.30	<0.40	--	<0.62	<0.62	<0.62	--	--	<0.62	<0.62
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.18	--	<0.18	--	<0.4	--	<0.15	--	<0.3	<0.3	<0.3	--	--	<0.3	<0.3
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	240	250	240	250	250	250	240	238	--	265	284	270	--	--	283	293
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	< 2	8.0	5.2	<2	<2	5.3	<2	13.0	--	13.0	<3	<3	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	<1	<1	1.50	1.00	1.50	1.00	<1	<5.0	--	<1.5	3.63	4.39	--	--	4.67	<
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	240	250	250	240	260	240	260	253	--	284	297	290	--	--	294	295
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	0.0110	0.0170	0.0000	0.0066	<0.006	<0.006	<0.006	<0.01	--	0.0200	<0.003	<0.003	--	--	0.0150	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	--	--	--	--	0.0	0.0	--	0.0	0.0	0.0	--	--	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	0.0	0.0	--	--	0.0	0.0	--	0.0	0.0	--	--	--	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1128.35	1128.43	1128.29	1128.65	1128.73	1128.53	1128.37	1128.52	1129.63	1129.30	1129.02	1128.50	1128.43	1128.46	1128.54	1128.03
PH, FIELD (STANDARD UNITS)	SU	NE	NE	8.58	7.72	7.75	7.96	7.49	7.29	7.37	8.35	--	7.02	7.13	7.51	--	--	7.55	4.39
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	418	441	420	528	465	439	349	399	--	453	502	500	--	--	542	--
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	8.60	11.60	11.10	10.50	8.40	10.70	10.30	7.60	--	10.90	10.80	9.70	--	--	9.50	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-12															
		PAL	ES	9/7/04	3/22/05	9/28/05	3/29/06	9/26/06	3/26/07	9/26/07	3/19/08	9/15/08	3/30/09	9/16/09	3/30/10	9/22/10	3/30/11	9/21/11	4/4/12
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.42	<0.42	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.9	<0.9
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.5	<0.3	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.3	<0.3	<0.4	<0.4	<0.4	<0.4	<0.42	<0.42
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.5	<0.5	<0.15	<0.15	<0.15	<0.15	<0.2	<0.2	<0.2	<0.2	<0.4	<0.4	<0.4	<0.4	<0.75	<0.75
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.5	<0.5	<0.15	<0.15	<0.15	<0.15	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.57	<0.57
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<1.3	<1.3	<0.3	<0.3	<0.35	<0.35	<1	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.7	<1.7
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<1.1	<1.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.56	<0.56
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.4	<0.4	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.36	<0.36
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.4	<0.4	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.3	<0.3	<0.4	<0.4	<0.4	<0.4	<0.49	<0.49
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	<5	<5
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.31	<0.31	<0.15	<0.15	<0.15	<0.15	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.41	<0.41
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.83	<0.3	<0.1	<0.1	<0.1	<0.1	<0.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.56	<0.56
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.8	<0.8	<0.15	<0.15	<0.15	<0.15	<1	<1	<1	<1	<1	<1	<1	<1	<0.91	<0.91
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	<0.2	<0.2	<0.2	<0.2	<1	<1	<1	<1	<1	<1	<1	<1	<0.66	<0.66
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.5	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.49	<0.49
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.7	<0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.41	<0.41
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<1	<1	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.7	<0.7	<0.7	<0.7	<0.97	<0.97
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<0.4	<0.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1.3	<1.3
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.29	<0.29	0.217	<0.2	<0.2	<0.2	0.67	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.24	<0.24
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.4	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.3	<0.3	<0.3	<0.4	<0.4	<0.4	<0.4	<0.83	<0.83
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.87	<0.87	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.4	<0.4	<0.4	<0.4	<0.81	<0.81
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<3	<3	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.3	<0.3	<0.4	<0.4	<0.4	<0.4	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.7	<0.7	<0.25	<0.25	<0.25	<0.25	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.99	<0.99
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.5	<0.3	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.43	<0.43
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<0.5	<0.5	<0.1	<0.1	0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.54	<0.54
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<1	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.3	<0.3	<0.3	<0.3	<0.79	<0.79
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.5	<0.5	<0.15	<0.15	<0.15	<0.15	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.87	<0.87
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4.3	<4.3
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.3	<0.3	<0.1	<0.1	<0.1	<0.1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.61	<0.61
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.8	<0.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.89	<0.89
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.6	<0.6	<0.75	<0.75	<0.75	<0.75	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.83	<0.83
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.6	<0.6	<0.75	<0.75	<0.75	<0.75	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.95	<0.95
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.29	<0.29	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.86	<0.86
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.45	<0.45	<0.1	<0.1	<0.1	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.45	<0.45
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	<0.7	<0.7	<0.7	<0.7	<1	<1	<1	<1	<2	<2	<2	<2	<1.7	<1.7
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.3	<0.3	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.67	<0.67
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.39	<0.39	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.89	<0.89
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.25	<0.25	<0.1	<0.1	<0.1	<0.1	<0.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.19	<0.19
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.44	<0.44	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.94	<0.94
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.48	<0.48
VINYL ACETATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.2	<0.2	<0.15	<0.15	<0.15	<0.15	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.18	<0.18
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.62	<0.62	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<2.6	<2.6
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.3	<0.3	0.108	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.6	<0.6
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	265	293	301	341	347	324	344	325	340	312	327	374	320	352	332	351
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	4.30	5.04	5.49	6.19	5.99	7.08	11.40	9.14	13.40	15.30	15.50	21.20	23.10	23.90	24.50	28.60
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	268	294	318	325	334	350	314	348	362	358	335	383	363	364	363	366
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	<	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	--	9.55	9.68	9.64	9.66	9.92	9.89	9.79	9.87	8.74	9.21	10.20	9.50	10.50	11.00
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	--	0.0	0.0	0.0	0.0	--	--	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	0.0	--	0.0	0.0	0.0	--	--	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1129.25	1128.96	1129.02	1128.65	1129.38	1128.65	1130.41	1130.23	1131.56	1129.94	1130.35	1130.34	1132.12	1131.72	1131.36	1129.46
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.03	7.88	7.50	7.58	--	7.66	--	7.60	7.70	8.10	7.50	7.60	7.66	7.50	7.43	7.54
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	572	566	573	639	--	643	--	555	581	596	626	706	665	669	687	697
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	9.90	7.50	9.70	7.20	--	10.20	--	8.50	12.40	11.50	13.10	12.70	11.10	9.50	12.50	10.90

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-12															
		PAL	ES	9/26/12	4/4/13	9/24/13	4/30/14	9/26/14	3/24/15	9/15/15	3/29/16	9/21/16	3/13/17	9/11/17	3/14/18	9/10/18	3/11/19	9/9/19	3/9/20
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	<0.4	<0.25	<0.25	<0.25	<0.60	<0.40	<0.40	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.40	<0.40
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.9	<0.29	<0.2	<0.2	<0.2	<0.50	<0.30	<0.30	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.29	<0.29
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.3	<0.23	<0.23	<0.23	<0.70	<0.40	<0.40	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.30	<0.30
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.42	<0.4	<0.28	<0.28	<0.28	<0.40	<0.30	<0.30	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.30	<0.30
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.75	<0.3	<0.19	<0.19	<0.19	<0.30	<0.40	<0.40	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.57	<0.24	<0.31	<0.31	<0.31	<0.40	<0.27	<0.27	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	<0.4	<0.34	<0.34	<0.34	<0.70	<0.40	<0.40	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.30	<0.30
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	<0.4	<0.24	<0.24	<0.24	<0.80	<0.40	<0.40	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.23	<0.23
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	<0.4	<0.45	<0.45	<0.45	<0.60	<0.40	<0.40	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.30	<0.30
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	<0.4	<0.31	<0.31	<0.31	<0.50	<0.40	<0.40	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.28	<0.28
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.4	<0.14	<0.14	<0.14	<0.40	<0.30	<0.30	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.29	<0.29
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<1.7	<0.4	<0.87	<0.87	<0.87	<0.70	<0.40	<0.40	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.25	<0.25
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<0.56	<0.3	<0.36	<0.36	<0.36	<0.60	<0.40	<0.40	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.30	<0.30
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.36	<0.3	<0.28	<0.28	<0.28	<0.26	<0.30	<0.30	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.24	<0.24
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.49	<0.4	<0.2	<0.2	<0.2	<0.40	<0.28	<0.28	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.18	<0.18
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.4	<0.18	<0.18	<0.18	<0.40	<0.30	<0.30	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.27	<0.27
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	<0.29	<0.13	<0.13	<0.13	<0.50	<0.29	<0.29	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.17	<0.17
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	<0.3	<0.32	<0.32	<0.32	<0.50	<0.70	<0.70	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<4	--	--	--	<7.0	<9.0	<9.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<3.0	<3.0
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	<4	--	--	--	<6.0	<7.0	<7.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<2.2	<2.2
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	<5	<2.9	--	--	--	<9.0	<7.0	<7.0	<9.0	<9.0	<9.0	<9.0	<9.0	<9.0	<4.0	<4.0
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.41	<0.3	<0.074	<0.074	<0.074	<0.24	<0.30	<0.30	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.40	<0.40
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.3	<0.25	<0.25	<0.25	<0.60	<0.40	<0.40	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.40	<0.40
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.5	<0.4	<0.4	<0.4	<0.80	<0.40	<0.40	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.30	<0.30
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.56	<0.3	<0.17	<0.17	<0.17	<0.40	<0.30	<0.30	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.29	<0.29
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.91	<0.3	<0.31	<0.31	<0.31	<0.70	<1.1	<1.1	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.90	1.5
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	<0.4	<0.13	<0.13	<0.13	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.29	<0.29
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	<0.3	<0.15	<0.15	<0.15	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	<0.4	<0.14	<0.14	<0.14	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	<0.66	<0.5	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.60	<0.60
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.49	<0.27	<0.26	<0.26	<0.26	<0.50	<0.30	<0.30	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.41	<0.28	<0.14	<0.14	<0.14	<0.50	<0.40	<0.40	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<0.97	<0.3	<0.34	<0.34	<0.34	<0.50	<0.80	<0.80	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<1.3	<0.23	<0.2	<0.2	<0.2	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.24	<0.27	<0.18	<0.18	<0.18	<0.70	<0.80	<0.80	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.60	<0.60
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.83	<0.3	<0.12	<0.12	<0.12	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.2	<0.26	<0.18	<0.18	<0.18	<0.40	<0.29	<0.29	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.16	<0.16
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.81	<0.3	<0.32	<0.32	<0.32	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.30	<0.30
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.3	<0.33	<0.33	<0.33	<0.80	<0.30	<0.30	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.22	<0.22
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.99	<0.4	<0.2	<0.2	<0.2	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.43	<0.4	<0.68	<0.68	<0.68	<0.50	<0.30	<0.30	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.40
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.3	<0.15	<0.15	<0.15	<0.29	<0.30	<0.30	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.40	<0.40
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<0.54	<0.3	<0.13	<0.13	<0.13	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<0.79	<0.3	<0.19	<0.19	<0.19	<0.30	<0.60	<0.60	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.40	<0.40
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.5	<0.26	<0.26	<0.26	<0.90	<0.40	<0.40	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.40	<0.40
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.3	<0.14	<0.14	<0.14	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.30	<0.30
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.87	<0.3	<0.15	<0.15	<0.15	<0.50	<0.30	<0.30	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.26	<0.26
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	<4.3	<4	--	--	--	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<2.6	<2.6
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.61	<0.4	<0.24	<0.24	<0.24	<0.30	<0.40	<0.40	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.89	<0.3	<0.16	<0.16	<0.16	<0.70	<1.0	<1.0	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.30	<0.30
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.4	<0.13	<0.13	<0.13	<0.50	<0.40	<0.40	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.3	<0.21	<0.21	<0.21	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.25	<0.25
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.83	<0.4	<0.27	<0.27	<0.27	<0.60	<0.40	<0.40	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.30	<0.30
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.29	<0.2	<0.2	<0.2	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.30	<0.30
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.95	<0.3	<0.15	<0.15	<0.15	<0.60	<0.30	<0.30	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.30	<0.30
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.4	<0.17	<0.17	<0.17	<0.50	<0.40	<0.40	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.30	<0.30
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.86	<0.27	<0.1	<0.1	<0.1	<0.50	<0.28	<0.28	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.29	<0.29
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.45	<0.29	<0.17	<0.17	<0.17	<0.50	<0.40	<0.40	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.27	<0.27
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	<1.7	<3	--	--	--	<3.0	<1.1	<1.1	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.67	<0.3	1.9	0.34	0.58	<0.30	<0.27	<0.27	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.21	<0.21
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.89	<0.3	<0.25	<0.25	<0.25	<0.60	<0.30	<0.30	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.30	<0.30
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.19	<0.3	<0.21	<0.21	<0.21	<0.40	<0.30	<0.30	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.23	<0.23
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.94	<0.3	<0.28	<0.28	<0.28	<0.70	<0.29	<0.29	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.40	<0.40
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.48	<0.5	<0.19	<0.19	<0.19	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
VINYL ACETATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.18	<0.18	<0.1	<0.1	<0.1	<0.19	<0.18	<0.18	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.14	<0.14
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<2.6	<0.6	0.46	<0.068	<0.068	<0.50	<0.70	<0.70	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.70	<0.70
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.6	<0.3	--	--	--	<0.40	<0.30	<0.30	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.26	<0.26
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	312	330	260	220	220	300	290	300	290	290	300	330	310	280	280	280
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	23.30	29.00	11.00	13.00	11.00	16.00	11.00	11.00	12.00	18.00	33.00	40.00	23.00	29.00	24.00	18.00
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	355	372	290	280	300	334	313	271	278	259	295	327	306	319	289	295
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	10.90	11.00	8.60	--	9.80	11.00	10.00	9.60	9.90	8.90	8.80	8.40	8.00	8.30	8.30	7.90
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	0.0	0.0	<	<	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	--	--	<	--	<	--	<	<	<	<	<	<	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	<	<	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1129.97	1228.78	1132.25	1130.83	1131.84	1130.10	1130.76	1132.59	1132.04	1133.75	1133.32	1130.62	1131.75	1132.41	1134.17	1132.29
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.66	7.58	7.76	7.13	7.84	7.12	7.53	8.11	8.16	7.48	7.66	7.43	6.54	7.55	7.39	7.34
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	653	675	594	503	283	643	559	535	551	562	624	675	610	626	615	594
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	9.90	8.80	11.00	9.40	11.80	10.00	10.00	10.70	10.11	9.42	10.25	9.47	10.24	9.42	9.98	10.02

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analyticial Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-12				
		PAL	ES	9/14/20	3/15/21	9/13/21	3/14/22	9/12/22
VOCs (ug/L)								
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	<0.40	<0.40	<0.34	<0.34	<0.34
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.29	<0.29	<0.38	<0.38	<0.38
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	<0.30	<0.30	<0.36	<0.36	<0.36
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.30	<0.30	<0.27	<0.27	<0.27
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.30	<0.30	<0.28	<0.28	<0.28
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.40	<0.40	<0.49	<0.49	<0.49
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.41	<0.41	<0.41
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	<0.23	<0.23	<0.43	<0.43	<0.43
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	<0.30	<0.30	<0.35	<0.35	<0.35
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	<0.28	<0.28	<0.50	<0.50	<0.50
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<0.29	<0.29	<0.34	<0.34	<0.34
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<0.25	<0.25	<0.49	<0.49	<0.49
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<0.30	<0.30	<0.33	<0.33	<0.33
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.24	<0.24	<0.69	<0.69	<0.69
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.18	<0.18	<0.37	<0.37	<0.37
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	<0.27	<0.27	<0.30	<0.30	<0.30
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	<0.17	<0.17	<0.28	<0.28	<0.28
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.31	<0.31	<0.31
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<3.0	<3.0	<3.3	<3.3	<3.3
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	<2.2	<2.2	<3.7	<3.7	<3.7
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	<4.0	<4.0	<4.1	<4.1	<4.1
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.40	<0.40	<0.47	<0.47	<0.47
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.40	<0.33	<0.33	<0.33
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.26	<0.26	<0.26
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.29	<0.29	<0.76	<0.76	<0.76
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.90	<0.90	<0.72	<0.72	<0.72
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	<0.29	<0.29	<0.34	<0.34	<0.34
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	<0.40	<0.40	<0.33	<0.33	<0.33
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	<0.40	<0.40	<0.27	<0.27	<0.27
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	<0.60	<0.60	<0.83	<0.83	<0.83
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.30	<0.30	<0.37	<0.37	<0.37
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.30	<0.30	<0.37	<0.37	<0.37
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<0.50	<0.50	<1.1	<1.1	<1.1
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<0.30	<0.30	<0.46	<0.46	<0.46
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.60	<0.60	<1.3	<1.3	<1.3
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.30	<0.30	<0.41	<0.41	<0.41
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.16	<0.16	<0.34	<0.34	<0.34
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.30	<0.30	<0.36	<0.36	<0.36
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.22	<0.22	<0.45	<0.45	<0.45
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.40	<0.40	<0.63	<0.63	<0.63
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.40	<0.40	<1.2	<1.2	<1.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.40	<0.26	<0.26	<0.26
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<0.30	<0.30	<0.42	<0.42	<0.42
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<0.40	<0.40	<0.41	<0.41	<0.41
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.40	<0.40	<0.57	<0.57	<0.57
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.39	<0.39	<0.39
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.26	<0.26	<0.30	<0.30	<0.30
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	<2.6	<2.6	<2.9	<2.9	<2.9
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.30	<0.30	<0.28	<0.28	<0.28
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.30	<0.30	<0.35	<0.35	<0.35
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.34	<0.34	<0.34
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.25	<0.25	<0.31	<0.31	<0.31
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.30	<0.30	<0.36	<0.36	<0.36
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.31	<0.31	<0.31
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.30	<0.30	<0.33	<0.33	<0.33
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	<0.30	<0.30	<0.29	<0.29	<0.29
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.29	<0.29	<0.33	<0.33	<0.33
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.27	<0.27	<0.55	<0.55	<0.55
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	<3.0	<3.0	<3.4	<3.4	<3.4
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.21	<0.21	<0.27	<0.27	<0.27
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.30	<0.30	<0.35	<0.35	<0.35
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.23	<0.23	<0.57	<0.57	<0.57
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.40	<0.40	<0.50	<0.50	<0.50
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.30	<0.30	<0.39	<0.39	<0.39
VINYL ACETATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.14	<0.14	<0.15	<0.15	<0.15
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.70	<0.70	<0.74	<0.74	<0.74
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.26	<0.26	<0.72	<0.72	<0.72
INORGANICS								
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	290	290	280	330	250
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[(1)]	mg/L	125	250	21.00	28.00	24.00	34.00	15.00
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	NE	NE	298	332	302	424	284
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--
SOLIDS, TOTAL DISSOLVED (MG/L)	mg/L	NE	NE	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[(1)]	mg/L	125	250	8.50	9.60	9.20	11.00	7.70
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--
FIELD PARAMETERS								
COMMENT, SAMPLE COLOR		NE	NE	0.0	0.0	0.0	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	<	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1132.13	1130.62	1130.50	1129.69	1130.45
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.31	7.38	6.91	7.31	7.25
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	607	657	640	756	538
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	10.26	9.94	10.26	10.75	10.22

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-14															
		PAL	ES	3/27/03	5/7/03	6/12/03	7/15/03	9/25/03	10/29/03	3/23/04	6/29/04	7/29/04	9/8/04	10/27/04	11/30/04	3/23/05	9/29/05	3/28/06	9/26/06
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.42	<0.42	--	--	--	--	--	--	--	<0.42	--	--	--	--	--	--
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.5	<0.5	--	--	--	--	--	--	--	<0.5	--	--	--	--	--	--
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.36	<0.5	--	--	--	--	--	--	--	<0.5	--	--	--	--	--	--
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.39	<0.5	--	--	--	--	--	--	--	<0.5	--	--	--	--	--	--
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<0.61	<1.3	--	--	--	--	--	--	--	<1.3	--	--	--	--	--	--
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<1.1	<1.1	--	--	--	--	--	--	--	<1.1	--	--	--	--	--	--
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.17	<0.4	--	--	--	--	--	--	--	<0.4	--	--	--	--	--	--
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.25	<0.4	--	--	--	--	--	--	--	<0.4	--	--	--	--	--	--
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.31	<0.31	--	--	--	--	--	--	--	<0.31	--	--	--	--	--	--
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.83	<0.83	--	--	--	--	--	--	--	<0.83	--	--	--	--	--	--
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.57	<0.8	--	--	--	--	--	--	--	<0.8	--	--	--	--	--	--
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.59	<0.5	--	--	--	--	--	--	--	<0.5	--	--	--	--	--	--
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.31	<0.7	--	--	--	--	--	--	--	<0.7	--	--	--	--	--	--
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<0.44	<1	--	--	--	--	--	--	--	<1	--	--	--	--	--	--
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<0.27	<0.4	--	--	--	--	--	--	--	<0.4	--	--	--	--	--	--
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.29	<0.29	--	--	--	--	--	--	--	<0.29	--	--	--	--	--	--
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.23	<0.4	--	--	--	--	--	--	--	<0.4	--	--	--	--	--	--
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.26	<0.5	--	--	--	--	--	--	--	<0.5	--	--	--	--	--	--
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.87	<0.87	--	--	--	--	--	--	--	<0.87	--	--	--	--	--	--
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<3	<3	--	--	--	--	--	--	--	<3	--	--	--	--	--	--
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.46	<0.7	--	--	--	--	--	--	--	<0.7	--	--	--	--	--	--
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.51	<0.5	--	--	--	--	--	--	--	<0.5	--	--	--	--	--	--
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<0.5	<0.5	--	--	--	--	--	--	--	<0.5	--	--	--	--	--	--
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<0.7	<1	--	--	--	--	--	--	--	<1	--	--	--	--	--	--
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.29	<0.5	--	--	--	--	--	--	--	<0.5	--	--	--	--	--	--
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.3	<0.3	--	--	--	--	--	--	--	<0.3	--	--	--	--	--	--
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.8	<0.8	--	--	--	--	--	--	--	<0.8	--	--	--	--	--	--
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.51	<0.6	--	--	--	--	--	--	--	<0.6	--	--	--	--	--	--
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.3	<0.6	--	--	--	--	--	--	--	<0.6	--	--	--	--	--	--
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.29	<0.29	--	--	--	--	--	--	--	<0.29	--	--	--	--	--	--
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.32	<0.45	--	--	--	--	--	--	--	<0.45	--	--	--	--	--	--
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.3	<0.3	--	--	--	--	--	--	--	<0.3	--	--	--	--	--	--
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.39	<0.39	--	--	--	--	--	--	--	<0.39	--	--	--	--	--	--
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.25	<0.25	--	--	--	--	--	--	--	<0.25	--	--	--	--	--	--
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.71	<0.44	--	--	--	--	--	--	--	<0.44	--	--	--	--	--	--
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.36	<0.5	--	--	--	--	--	--	--	<0.5	--	--	--	--	--	--
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.2	<0.2	--	--	--	--	--	--	--	<0.2	--	--	--	--	--	--
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.62	<0.62	--	--	--	--	--	--	--	<0.62	--	--	--	--	--	--
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.3	<0.3	--	--	--	--	--	--	--	<0.3	--	--	--	--	--	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	203	207	194	235	--	--	--	219	212	207	212	--	225	--	--	--
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	1.8	--	**6.22**	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	<1.3	<1	<1.3	<1.3	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	87	66	89	68.2	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	<0.1	--	<0.09	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	<0.2	0.399	<0.06	<0.06	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	<3	41.0	<3	46.7	--	--	--	40.3	23.5	<	14.8	--	<	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	12.00	11.60	11.00	10.90	--	--	--	4.12	6.60	9.31	9.91	--	7.97	--	--	--
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	<1.6	<0.002	<1.6	<1.6	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	<0.003	--	<3	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	<0.004	10	<4	<4	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	0.13	<0.1	0.11	0.18	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	230	230	234	236	--	--	--	194	208	222	228	--	221	--	--	--
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	0.020	0.031	0.118	0.016	--	0.017	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	<1	1.35	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	49	0.02	268	84	--	--	--	180	119	19.7	--	32.4	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	<0.07	1.31	<0.07	<0.07	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	<0.003	--	<3	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	3.32	5.70	4.13	4.50	--	--	--	0.94	3.19	4.48	--	3.62	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	<3	<2	<0.9	<0.9	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	<0.003	<0.006	<3	<3	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	9.11	6.82	7.17	7.77	--	--	--	--	--	--	--	--	--	--	--	--
THALLIUM, DISSOLVED (UG/L TL)	ug/L	2	0.4	<0.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	<0.005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	16.0	<	14.8	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	0.0	0.0	0.0	0.0	--	--	--	--	--	0.0	--	--	0.0	--	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	0.0	0.0	--	--	--	--	--	0.0	--	--	0.0	--	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1068.30	1248.04	1067.85	1067.24	1066.00	1065.49	1064.08	1066.06	1066.33	1066.46	1066.55	1066.54	1065.77	1063.83	1063.76	Dry
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.49	--	7.50	--	--	--	--	7.45	7.82	7.65	8.07	7.49	7.75	--	--	--
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	430	--	418	--	--	--	--	420	446	493	494	518	481	--	--	--
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	8.20	--	14.60	--	--	--	--	11.90	13.20	10.90	8.80	8.30	7.60	--	--	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-14															
		PAL	ES	3/27/07	9/27/07	3/19/08	9/15/08	3/30/09	9/15/09	3/30/10	9/21/10	3/29/11	9/20/11	4/3/12	9/25/12	4/3/13	9/24/13	4/29/14	9/26/14
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.25	--	<0.25
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.2	--	<0.2	--	<0.5	--	<0.5	--	<0.9	--	<0.9	--	<0.2	--	<0.2
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.23	--	<0.23
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	<0.42	--	<0.42	--	<0.28	--	<0.28
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--	<0.75	--	<0.75	--	<0.19	--	<0.19
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.57	--	<0.57	--	<0.31	--	<0.31
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.34	--	<0.34
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.24	--	<0.24
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.45	--	<0.45
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.31	--	<0.31
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.14	--	<0.14
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<1	--	<1.3	--	<1.3	--	<1.3	--	<1.7	--	<1.7	--	<0.87	--	<0.87
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.2	--	<0.3	--	<0.3	--	<0.3	--	<0.56	--	<0.56	--	<0.36	--	<0.36
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.3	--	<0.3	--	<0.3	--	<0.36	--	<0.36	--	<0.28	--	<0.28
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	<0.49	--	<0.49	--	<0.2	--	<0.2
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.18	--	<0.18
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.13	--	<0.13
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.32	--	<0.32
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	<6.5	--	<6.5	--	<6.5	--	<6.5	--	<5	--	<5	--	--	--	--
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.41	--	<0.41	--	0.41	--	<0.074
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.25	--	<0.25
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.4	--	<0.4
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.2	--	<0.4	--	<0.4	--	<0.4	--	<0.56	--	<0.56	--	<0.17	--	<0.17
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<1	--	<1	--	<1	--	<1	--	<0.91	--	<0.91	--	<0.31	--	<0.31
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.13	--	<0.13
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.15	--	<0.15
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.14	--	<0.14
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	<1	--	<1	--	<1	--	<1	--	<0.66	--	<0.66	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.3	--	<0.3	--	<0.3	--	<0.49	--	<0.49	--	<0.26	--	<0.26
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.1	--	<0.1	--	<0.2	--	<0.2	--	<0.41	--	<0.41	--	<0.14	--	<0.14
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<0.6	--	<0.6	--	<0.7	--	<0.7	--	<0.97	--	<0.97	--	<0.34	--	<0.34
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<1.3	--	<1.3	--	<0.2	--	<0.2
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.3	--	<0.4	--	<0.4	--	<0.4	--	<0.24	--	<0.24	--	<0.18	--	<0.18
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	<0.83	--	<0.83	--	<0.12	--	<0.12
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.18	--	<0.18
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.2	--	<0.2	--	<0.4	--	<0.4	--	<0.81	--	<0.81	--	<0.32	--	<0.32
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.3	--	<0.4	--	<0.4	--	<0.6	--	<0.6	--	<0.33	--	<0.33
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.3	--	<0.3	--	<0.3	--	<0.3	--	<0.99	--	<0.99	--	<0.2	--	<0.2
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.43	--	<0.43	--	<0.68	--	<0.68
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.15	--	<0.15
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.1	--	<0.2	--	<0.2	--	<0.2	--	<0.54	--	<0.54	--	<0.13	--	<0.13
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	<0.2	--	<0.2	--	<0.3	--	<0.3	--	<0.79	--	<0.79	--	<0.19	--	<0.19
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.26	--	<0.26
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.14	--	<0.14
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.87	--	<0.87	--	<0.15	--	<0.15
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	<2	--	<2	--	<2	--	<2	--	<4.3	--	<4.3	--	--	--	--
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.2	--	<0.5	--	<0.5	--	<0.5	--	<0.61	--	<0.61	--	<0.24	--	<0.24
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<1	--	<1	--	<1	--	<1	--	<0.89	--	<0.89	--	<0.16	--	<0.16
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.13	--	<0.13
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.21	--	<0.21
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.8	--	<0.8	--	<0.8	--	<0.8	--	<0.83	--	<0.83	--	<0.27	--	<0.27
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.2	--	<0.2
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.8	--	<0.8	--	<0.8	--	<0.8	--	<0.95	--	<0.95	--	<0.15	--	<0.15
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.17	--	<0.17
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.1	--	<0.1	--	<0.1	--	<0.1	--	<0.86	--	<0.86	--	<0.1	--	<0.1
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.3	--	<0.3	--	<0.3	--	<0.3	--	<0.45	--	<0.45	--	<0.17	--	<0.17
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	<1	--	<1	--	<2	--	<2	--	<1.7	--	<1.7	--	--	--	--
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<0.67	--	<0.67	--	3.6	--	0.68
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.2	--	<0.2	--	<0.5	--	<0.5	--	<0.89	--	<0.89	--	<0.25	--	<0.25
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.4	--	<0.4	--	<0.4	--	<0.19	--	<0.19	--	<0.21	--	<0.21
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.94	--	<0.94	--	<0.28	--	<0.28
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.4	--	<0.4	--	<0.4	--	<0.48	--	<0.48	--	<0.19	--	<0.19
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.18	--	<0.18	--	<0.1	--	<0.1
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.4	--	<0.4	--	<0.4	--	<0.4	--	<2.6	--	<2.6	--	0.86	--	<0.068
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	--	--	--	--	--	--	--
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	212	230	260	235	248	246	190	244	247	233	207	220	220	210	180
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	--	5.02	7.60	9.02	13.10	14.70	11.00	11.30	15.10	18.50	15.10	18.20	16.00	17.00	20.00	16.00
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	--	194	233	244	266	256	262	216	263	266	248	293	273	260	280	260
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	--	8.14	6.83	8.27	8.09	7.50	6.78	7.36	7.96	8.20	8.50	8.40	7.20	9.80	9.40	9.70
THALLIUM, DISSOLVED (UG/L TL)	ug/L	2	0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	0.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0	--	--	0.0	--	0.0
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	--	0.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	<	<	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	Dry	1067.79	1074.04	1086.34	1078.99	1074.36	1070.45	1080.07	1080.08	1082.37	1076.11	1072.08	1068.22	1076.49	1074.69	1076.39
PH, FIELD (STANDARD UNITS)	SU	NE	NE	--	--	7.95	7.76	8.02	7.57	7.69	8.01	7.79	7.67	7.67	7.66	7.27	7.77	7.62	7.83
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	--	--	405	414	462	521	491	430	469	556	534	539	508	541	564	510
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	--	--	8.10	11.40	9.40	16.00	13.90	13.20	11.60	14.10	13.30	14.80	9.70	14.10	9.40	11.80

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-14											
		PAL	ES	3/14/17	9/12/17	3/15/18	9/11/18	3/12/19	9/10/19	3/10/20	9/15/20	3/16/21	9/14/21	3/14/22	9/13/22
VOCs (ug/L)															
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	<0.60	--	<0.60	--	<0.40	--	<0.40	--	<0.34	--	<0.34
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.50	--	<0.50	--	<0.29	--	<0.29	--	<0.38	--	<0.38
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.70	--	<0.70	--	<0.30	--	<0.30	--	<0.36	--	<0.36
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--	<0.27	--	<0.27
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.28	--	<0.28
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.49	--	<0.49
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	<0.70	--	<0.70	--	<0.30	--	<0.30	--	<0.41	--	<0.41
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	<0.80	--	<0.80	--	<0.23	--	<0.23	--	<0.43	--	<0.43
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.35	--	<0.35
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	<0.50	--	<0.50	--	<0.28	--	<0.28	--	<0.50	--	<0.50
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.40	--	<0.40	--	<0.29	--	<0.29	--	<0.34	--	<0.34
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<0.70	--	<0.70	--	<0.25	--	<0.25	--	<0.49	--	<0.49
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.33	--	<0.33
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.26	--	<0.26	--	<0.24	--	<0.24	--	<0.69	--	<0.69
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.40	--	<0.40	--	<0.18	--	<0.18	--	<0.37	--	<0.37
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.40	--	<0.40	--	<0.27	--	<0.27	--	<0.30	--	<0.30
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	<0.50	--	<0.50	--	<0.17	--	<0.17	--	<0.28	--	<0.28
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.31	--	<0.31
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<7.0	--	<7.0	--	<3.0	--	<3.0	--	<3.3	--	<3.3
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	<6.0	--	<6.0	--	<2.2	--	<2.2	--	<3.7	--	<3.7
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	<9.0	--	<9.0	--	<4.0	--	<4.0	--	<4.1	--	<4.1
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.24	--	<0.24	--	<0.40	--	<0.40	--	<0.47	--	<0.47
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.60	--	<0.60	--	<0.40	--	<0.40	--	<0.33	--	<0.33
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.80	--	<0.80	--	<0.30	--	<0.30	--	<0.26	--	<0.26
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.40	--	<0.40	--	<0.29	--	<0.29	--	<0.76	--	<0.76
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.70	--	<0.70	--	<0.90	--	<0.90	--	<0.72	--	<0.72
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.29	--	<0.29	--	<0.34	--	<0.34
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.33	--	<0.33
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.27	--	<0.27
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	<0.50	--	<0.50	--	<0.60	--	<0.60	--	<0.83	--	<0.83
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.37	--	<0.37
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.37	--	<0.37
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<1.1	--	<1.1
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.46	--	<0.46
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.70	--	<0.70	--	<0.60	--	<0.60	--	<1.3	--	<1.3
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.41	--	<0.41
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.16	--	<0.16	--	<0.34	--	<0.34
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--	<0.36	--	<0.36
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.80	--	<0.80	--	<0.22	--	<0.22	--	<0.45	--	<0.45
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.63	--	<0.63
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.50	--	<0.50	--	<0.40	--	<0.40	--	<1.2	--	<1.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.29	--	<0.29	--	<0.40	--	<0.40	--	<0.26	--	<0.26
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.42	--	<0.42
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	<0.30	--	<0.30	--	<0.40	--	<0.40	--	<0.41	--	<0.41
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.90	--	<0.90	--	<0.40	--	<0.40	--	<0.57	--	<0.57
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--	<0.39	--	<0.39
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.50	--	<0.50	--	<0.26	--	<0.26	--	<0.30	--	<0.30
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	<4.0	--	<4.0	--	<2.6	--	<2.6	--	<2.9	--	<2.9
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.28	--	<0.28
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.70	--	<0.70	--	<0.30	--	<0.30	--	<0.35	--	<0.35
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.34	--	<0.34
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.25	--	<0.25	--	<0.31	--	<0.31
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.36	--	<0.36
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--	<0.31	--	<0.31
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.33	--	<0.33
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.29	--	<0.29
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.50	--	<0.50	--	<0.29	--	<0.29	--	<0.33	--	<0.33
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.50	--	<0.50	--	<0.27	--	<0.27	--	<0.55	--	<0.55
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	<3.0	--	<3.0	--	<3.0	--	<3.0	--	<3.4	--	<3.4
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.30	--	<0.30	--	<0.21	--	<0.21	--	<0.27	--	<0.27
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.35	--	<0.35
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.23	--	<0.23	--	<0.57	--	<0.57
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.70	--	<0.70	--	<0.40	--	<0.40	--	<0.50	--	<0.50
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.39	--	<0.39
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.19	--	<0.19	--	<0.14	--	<0.14	--	<0.15	--	<0.15
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.50	--	<0.50	--	<0.70	--	<0.70	--	<0.74	--	<0.74
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.40	--	<0.40	--	<0.26	--	<0.26	--	<0.72	--	<0.72
INORGANICS															
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	260	270	270	260	240	240	240	240	220	200	210	200
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	22.00	27.00	22.00	21.00	28.00	25.00	19.00	20.00	21.00	16.00	18.00	20.00
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	246	269	253	265	284	254	260	262	270	223	289	266
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	10.00	8.00	6.60	7.30	7.00	7.20	6.80	7.20	7.10	7.70	8.70	9.00
THALLIUM, DISSOLVED (UG/L TL)	ug/L	2	0.4	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	--	--	--	--	--	--	--
ZINC, DISSOLVED (UG/L ZN)	ug/L	2500	5000	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS															
COMMENT, SAMPLE COLOR		NE	NE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COMMENT, SAMPLE ODOR		NE	NE	<	<	<	<	<	<	0.0	<	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	0.0	0.0	0.0	0.0	0.0	0.0	<	0.0	0.0	0.0	0.0	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1082.63	1088.25	1083.05	1082.42	1086.86	1087.89	1086.34	1086.00	1081.36	1077.76	1075.24	1073.32
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.53	7.84	7.25	6.46	7.55	7.38	7.42	7.45	7.35	7.27	7.46	7.29
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	552	569	529	541	572	540	535	537	524	479	513	530
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	9.34	10.25	10.43	10.24	9.44	10.38	9.92	10.39	10.01	10.17	10.97	10.04

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-14Z															
		PAL	ES	3/27/03	5/7/03	6/12/03	7/15/03	9/24/03	10/29/03	3/24/04	6/29/04	7/29/04	9/8/04	3/23/05	9/29/05	3/28/06	9/26/06	3/27/07	9/27/07
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	<0.42	<0.42	--	--	--	--	--	--	--	<0.42	--	<0.2	--	<0.2	--	<0.2
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.5	<0.5	--	--	--	--	--	--	--	<0.5	--	<0.1	--	<0.1	--	<0.2
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	<0.36	<0.5	--	--	--	--	--	--	--	<0.5	--	<0.15	--	<0.15	--	<0.2
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	<0.39	<0.5	--	--	--	--	--	--	--	<0.5	--	<0.15	--	<0.15	--	<0.4
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	<0.61	<1.3	--	--	--	--	--	--	--	<1.3	--	<0.3	--	<0.35	--	<1
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	<1.1	<1.1	--	--	--	--	--	--	--	<1.1	--	<0.1	--	<0.1	--	<0.2
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.17	<0.4	--	--	--	--	--	--	--	<0.4	--	<0.1	--	<0.1	--	<0.2
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.25	<0.4	--	--	--	--	--	--	--	<0.4	--	<0.1	--	<0.1	--	<0.2
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	--	--	--	--	--	--	--	--	--	--	<6.5	--	<6.5	--	<6.5
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.31	<0.31	--	--	--	--	--	--	--	<0.31	--	<0.15	--	<0.15	--	<0.2
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	<0.83	<0.83	--	--	--	--	--	--	--	<0.83	--	<0.1	--	<0.1	--	<0.2
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	<0.57	<0.8	--	--	--	--	--	--	--	<0.8	--	<0.15	--	<0.15	--	<1
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	--	--	--	--	--	--	<0.2	--	--	--	--
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.59	<0.5	--	--	--	--	--	--	--	<0.5	--	<0.2	--	<0.2	--	<0.2
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	<0.31	<0.7	--	--	--	--	--	--	--	<0.7	--	<0.1	--	<0.1	--	<0.1
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	<0.44	<1	--	--	--	--	--	--	--	<1	--	<0.6	--	<0.6	--	<0.6
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	<0.27	<0.4	--	--	--	--	--	--	--	<0.4	--	<0.1	--	<0.1	--	<0.2
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	<0.29	<0.29	--	--	--	--	--	--	--	<0.29	--	0.318	--	<0.2	--	0.5
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	<0.23	<0.4	--	--	--	--	--	--	--	<0.4	--	<0.2	--	<0.2	--	<0.2
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.26	<0.5	--	--	--	--	--	--	--	<0.5	--	<0.1	--	<0.1	--	<0.2
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	<0.87	<0.87	--	--	--	--	--	--	--	<0.87	--	<0.1	--	<0.1	--	<0.2
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<3	<3	--	--	--	--	--	--	--	<3	--	<0.1	--	<0.1	--	<0.2
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	<0.46	<0.7	--	--	--	--	--	--	--	<0.7	--	<0.25	--	<0.25	--	<0.3
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.51	<0.5	--	--	--	--	--	--	--	<0.5	--	<0.4	--	<0.4	--	<0.4
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	<0.5	<0.5	--	--	--	--	--	--	--	<0.5	--	<0.1	--	<0.1	--	<0.1
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	<0.7	<1	--	--	--	--	--	--	--	<1	--	<0.2	--	<0.2	--	<0.2
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	<0.29	<0.5	--	--	--	--	--	--	--	<0.5	--	<0.15	--	<0.15	--	<0.2
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	--	--	--	--	--	--	--	--	--	--	<2	--	<2	--	<2
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	<0.3	<0.3	--	--	--	--	--	--	--	<0.3	--	<0.1	--	<0.1	--	<0.2
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.8	<0.8	--	--	--	--	--	--	--	<0.8	--	<1	--	<1	--	<1
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	<0.51	<0.6	--	--	--	--	--	--	--	<0.6	--	<0.75	--	<0.75	--	<0.8
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	<0.3	<0.6	--	--	--	--	--	--	--	<0.6	--	<0.75	--	<0.75	--	<0.8
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	<0.29	<0.29	--	--	--	--	--	--	--	<0.29	--	<0.1	--	<0.1	--	<0.1
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	<0.32	<0.45	--	--	--	--	--	--	--	<0.45	--	<0.1	--	<0.1	--	<0.3
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	<0.7	--	<0.7	--	<1
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	<0.3	<0.3	--	--	--	--	--	--	--	<0.3	--	<0.4	--	<0.4	--	<0.4
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	<0.39	<0.39	--	--	--	--	--	--	--	<0.39	--	<0.1	--	<0.1	--	<0.2
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	<0.25	<0.25	--	--	--	--	--	--	--	<0.25	--	<0.1	--	<0.1	--	<0.2
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	<0.71	<0.44	--	--	--	--	--	--	--	<0.44	--	<0.2	--	<0.2	--	<0.2
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	<0.36	<0.5	--	--	--	--	--	--	--	<0.5	--	<0.2	--	<0.2	--	<0.2
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	<0.2	<0.2	--	--	--	--	--	--	--	<0.2	--	<0.15	--	<0.15	--	<0.2
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.62	<0.62	--	--	--	--	--	--	--	<0.62	--	<0.4	--	<0.4	--	<0.4
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	<0.3	<0.3	--	--	--	--	--	--	--	<0.3	--	<0.1	--	<0.1	--	<0.2
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	228	242	225	225	210	--	215	--	227	237	227	202	220	247	234	230
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	<1.2	--	**11.9**	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	<1.3	<1	<1.3	<1.3	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	35	27	25	24.2	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	<0.1	--	<0.09	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	<0.2	0.752	<0.06	<0.06	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	<3	44	24.6	44	16.5	--	--	34.7	20.7	<	<	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	17.8	18.1	17.7	17.3	16.7	--	15.8	14.8	14.1	15.9	16.3	14.8	14.2	14.3	14.2	14.1
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	4	<0.002	<1.6	<1.6	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	<0.003	--	<3	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	<0.004	<4	<4	<4	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	<0.1	<0.1	<0.1	0.12	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	280	288	279	270	286	--	276	263	267	261	270	267	262	271	270	252
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	<	0.0178	<	<	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	10	0.008	4	<0.6	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	<0.07	0.851	<0.07	<0.07	--	--	--	--	--	--	--	--	--	<0.2	--	<1
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	<0.003	--	<3	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	9.1	9.84	8.14	9.32	8.44	--	6.58	8.41	8.05	8.25	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	<3	<2	<0.9	<0.9	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	<0.003	<0.006	<3	<3	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	11.90	10.90	11.80	11.00	--	--	--	--	--	--	--	8.88	8.68	8.65	8.62	9.16
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	<0.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	<0.005	15	10	<1.5	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	0.0	--	--	--	--	--	0.0	--	--	--	0.0	--	0.0	0.0	--	--
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COMMENT, SAMPLE TURBIDITY		NE	NE	--	--	--	--	--	--	0.0	--	--	--	0.0	--	0.0	0.0	--	--
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1067.30	1067.07	1066.99	1065.41	1065.39	1064.72	1063.38	1065.48	1065.62	1065.78	1065.21	1063.15	1061.17	1060.48	1060.50	1066.73
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.79	7.75	7.37	7.67	7.52	--	--	7.32	7.72	7.86	7.69	7.97	7.66	--	7.83	--
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	523	523	519	574	551	--	--	601	576	606	593	567	567	--	526	--
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	7.80	10.10	11.60	10.70	10.00	--	<	10.90	10.10	10.20	7.80	8.40	11.40	--	11.60	--

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Groundwater Analytical Results
MW-14Z

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-14Z																
		PAL	ES	3/19/08	9/15/08	3/30/09	9/15/09	3/30/10	9/21/10	3/29/11	9/20/11	4/3/12	9/25/12	4/3/13	9/24/13	4/29/14	9/24/14	3/25/15	9/16/15
VOCs (ug/L)																			
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	--	--	--	--	--	--	--	--	--	--	<0.25	--	<0.25	--	<0.40
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.2	--	<0.5	--	<0.5	--	<0.9	--	<0.9	--	<0.2	--	<0.2	--	<0.29
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	--	--	--	--	--	--	--	--	--	--	<0.23	--	<0.23	--	<0.30
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.3	--	<0.4	--	<0.4	--	<0.42	--	<0.42	--	<0.28	--	<0.28	--	<0.30
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.2	--	<0.4	--	<0.4	--	<0.75	--	<0.75	--	<0.19	--	<0.19	--	<0.30
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.4	--	<0.4	--	<0.4	--	<0.57	--	<0.57	--	<0.31	--	<0.31	--	<0.40
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.34	--	<0.34	--	<0.30
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.24	--	<0.24	--	<0.23
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	--	--	--	--	--	--	--	--	--	--	<0.45	--	<0.45	--	<0.30
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	--	--	--	--	--	--	--	--	--	--	<0.31	--	<0.31	--	<0.28
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	<0.14	--	<0.14	--	<0.29
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<1.3	--	<1.3	--	<1.3	--	<1.7	--	<1.7	--	<0.87	--	<0.87	--	<0.25
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.3	--	<0.3	--	<0.3	--	<0.61	--	<0.56	--	<0.36	--	<0.36	--	<0.30
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.3	--	<0.3	--	<0.3	--	<0.36	--	<0.36	--	<0.28	--	<0.28	--	<0.24
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.3	--	<0.4	--	<0.4	--	<0.49	--	<0.49	--	<0.2	--	<0.2	--	<0.18
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	--	--	--	--	--	--	--	--	--	--	<0.18	--	<0.18	--	<0.27
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	--	--	--	--	--	--	--	--	--	--	<0.13	--	<0.13	--	<0.17
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.32	--	<0.32	--	<0.30
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<3.0
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.2
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	<6.5	--	<6.5	--	<6.5	--	<5	--	<5	--	--	--	--	--	<4.0
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.2	--	<0.2	--	<0.2	--	<0.41	--	<0.41	--	0.38	--	<0.074	--	<0.40
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.25	--	<0.25	--	<0.40
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.4	--	<0.4	--	<0.30
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.4	--	<0.4	--	<0.4	--	<0.56	--	<0.56	--	<0.17	--	<0.17	--	<0.29
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<1	--	<1	--	<1	--	<0.91	--	<0.91	--	<0.31	--	<0.31	--	<0.90
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.13	--	<0.13	--	<0.29
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.15	--	<0.15	--	<0.40
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.14	--	<0.14	--	<0.40
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	--	--	--	--	<1	--	<0.66	--	<0.66	--	--	--	--	--	<0.60
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.3	--	<0.3	--	<0.3	--	<0.49	--	<0.49	--	<0.26	--	<0.26	--	<0.30
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.1	--	<0.2	--	<0.2	--	<0.41	--	<0.41	--	<0.14	--	<0.14	--	<0.30
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<0.6	--	<0.7	--	<0.7	--	<0.97	--	<0.97	--	<0.34	--	<0.34	--	<0.50
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.2	--	<0.2	--	<0.2	--	<1.3	--	<1.3	--	<0.2	--	<0.2	--	<0.30
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.4	--	<0.4	--	<0.4	--	<0.24	--	<0.24	--	<0.18	--	<0.18	--	<0.60
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.3	--	<0.4	--	<0.4	--	<0.83	--	<0.83	--	<0.12	--	<0.12	--	<0.30
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.18	--	<0.18	--	<0.16
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.2	--	<0.4	--	<0.4	--	<0.81	--	<0.81	--	<0.32	--	<0.32	--	<0.30
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.3	--	<0.4	--	<0.4	--	<0.56	--	<0.6	--	<0.33	--	<0.33	--	<0.22
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.3	--	<0.3	--	<0.3	--	<0.99	--	<0.99	--	<0.2	--	<0.2	--	<0.40
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.4	--	<0.4	--	<0.4	--	<0.43	--	<0.43	--	<0.68	--	<0.68	--	<0.40
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.15	--	<0.15	--	<0.40
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.2	--	<0.2	--	<0.2	--	<2.6	--	<0.54	--	0.27	--	<0.13	--	<0.30
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	<0.2	--	<0.3	--	<0.3	--	<0.79	--	<0.79	--	<0.19	--	<0.19	--	<0.40
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.26	--	<0.26	--	<0.40
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.14	--	<0.14	--	<0.30
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.2	--	<0.2	--	<0.2	--	<0.87	--	<0.87	--	<0.15	--	<0.15	--	<0.26
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	<2	--	<2	--	<2	--	<4.3	--	<4.3	--	--	--	--	--	<2.6
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.5	--	<0.5	--	<0.5	--	<0.54	--	<0.61	--	<0.24	--	<0.24	--	<0.30
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<1	--	<1	--	<1	--	<0.89	--	<0.89	--	<0.16	--	<0.16	--	<0.30
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.13	--	<0.13	--	<0.30
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.21	--	<0.21	--	<0.25
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.8	--	<0.8	--	<0.8	--	<0.83	--	<0.83	--	<0.27	--	<0.27	--	<0.30
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.2	--	<0.2	--	<0.30
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.8	--	<0.8	--	<0.8	--	<0.95	--	<0.95	--	<0.15	--	<0.15	--	<0.30
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	<0.17	--	<0.17	--	<0.30
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.1	--	<0.1	--	<0.1	--	<0.86	--	<0.86	--	<0.1	--	<0.1	--	<0.29
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.3	--	<0.3	--	<0.3	--	<0.45	--	<0.45	--	<0.17	--	<0.17	--	<0.27
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	<1	--	<2	--	<2	--	<1.7	--	<1.7	--	--	--	--	--	<3.0
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.4	--	<0.4	--	<0.4	--	<0.67	--	<0.67	--	3.4	--	0.66	--	<0.21
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.2	--	<0.5	--	<0.5	--	<0.89	--	<0.89	--	<0.25	--	<0.25	--	<0.30
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.4	--	<0.4	--	<0.4	--	<0.19	--	<0.19	--	<0.21	--	<0.21	--	<0.23
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.2	--	<0.2	--	<0.2	--	<0.94	--	<0.94	--	<0.28	--	<0.28	--	<0.40
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.4	--	<0.4	--	<0.4	--	<0.48	--	<0.48	--	<0.19	--	<0.19	--	<0.30
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.2	--	<0.2	--	<0.2	--	<0.18	--	<0.18	--	<0.1	--	<0.1	--	<0.14
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.4	--	<0.4	--	<0.4	--		--	<2.6	--	0.67	--	<0.068	--	<0.70
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.2	--	<0.2	--	<0.2	--	<0.6	--	--	--	--	--	--	--	<0.26
INORGANICS																			
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	248	245	206	254	245	252	241	235	243	229	230	220	200	190	230	230
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)[1]	mg/L	125	250	12.3	12.6	14.6	15.6	16.4	17.2	16.3	17.8	19.5	20.0	22.0	20.0	23.0	22.0	21.0	20.0
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	267	256	265	263	288	282	270	263	262	282	278	290	290	290	298	288
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	<1	--	<1	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)[1]	mg/L	125	250	8.28	8.23	8.55	7.43	8.66	9.09	7.84	8.30	8.40	8.80	9.50	9.70	9.70	9.10	10.00	9.90
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																			
COMMENT, SAMPLE COLOR		NE	NE	--	0.0	--	1.0	--	--	--	--	--	--	--	<	<	<	--	0.0
COMMENT, SAMPLE ODOR		NE	NE	--	--	--	--	--	--	--	--	--	--	--	<	--	<	--	<
COMMENT, SAMPLE TURBIDITY		NE	NE	--	0.0	--	1.0	--	--	--	--	--	--	--	<	<	<	--	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1072.05	1082.77	1025.67	1071.89	1068.76	1077.70	1077.07	1078.21	1072.83	1070.00	1067.05	1073.60	1072.67	1073.92	1068.48	1067.02
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.86	7.66	7.90	7.71	7.49	7.65	7.69	7.64	7.60	7.60	7.16	7.63	7.30	7.85	7.75	7.42
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	448	398	471	507	561	548	492	555	564	566	554	568	581	557	573	536
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	11.30	17.70	11.00	16.30	12.40	12.70	11.40	13.30	13.60	13.30	11.90	13.10	11.40	15.70	10.70	11.40

Notes:
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-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Analytical Parameters	Units	NR 140 Standards		Well No./Sampling Date MW-14Z													
		PAL	ES	3/30/16	9/22/16	3/14/17	9/12/17	3/15/18	9/11/18	3/12/19	9/10/19	3/10/20	9/15/20	3/16/21	9/14/21	3/14/22	9/13/22
VOCs (ug/L)																	
1,1,1,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	7	70	--	<0.60	--	<0.60	--	<0.60	--	<0.40	--	<0.40	--	<0.34	--	<0.34
1,1,1-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	40	200	--	<0.50	--	<0.50	--	<0.50	--	<0.29	--	<0.29	--	<0.38	--	<0.38
1,1,2,2-TETRACHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.70	--	<0.70	--	<0.70	--	<0.30	--	<0.30	--	<0.36	--	<0.36
1,1,2-TRICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--	<0.27	--	<0.27
1,1-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	85	850	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.28	--	<0.28
1,1-DICHLOROETHYLENE IN WHL WTR SAMPLE (UG/L)	ug/L	0.7	7	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.49	--	<0.49
1,1-DICHLOROPROPENE (UG/L)	ug/L	NE	NE	--	<0.70	--	<0.70	--	<0.70	--	<0.30	--	<0.30	--	<0.41	--	<0.41
1,2,3-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	NE	NE	--	<0.80	--	<0.80	--	<0.80	--	<0.23	--	<0.23	--	<0.43	--	<0.43
1,2,3-TRICHLOROPROPANE IN WHOLE WATR SAMPLE (UG/L)	ug/L	12	60	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.35	--	<0.35
1,2,4-TRICHLOROBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	14	70	--	<0.50	--	<0.50	--	<0.50	--	<0.28	--	<0.28	--	<0.50	--	<0.50
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.40	--	<0.40	--	<0.40	--	<0.29	--	<0.29	--	<0.34	--	<0.34
1,2-DIBROMO-3-CHLOROPROPANE IN WHL WTR SAMP (UG/L)	ug/L	0.02	0.2	--	<0.70	--	<0.70	--	<0.70	--	<0.25	--	<0.25	--	<0.49	--	<0.49
1,2-DIBROMOETHANE(EDB) IN WHOLE WATER SAMPLE(UG/L)	ug/L	0.005	0.05	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.33	--	<0.33
1,2-DICHLOROETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.26	--	<0.26	--	<0.26	--	<0.24	--	<0.24	--	<0.69	--	<0.69
1,2-DICHLOROPROPANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.40	--	<0.40	--	<0.40	--	<0.18	--	<0.18	--	<0.37	--	<0.37
1,3,5-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	96	480	--	<0.40	--	<0.40	--	<0.40	--	<0.27	--	<0.27	--	<0.30	--	<0.30
1,3-DICHLOROPROPANE (UG/L)	ug/L	120	600	--	<0.50	--	<0.50	--	<0.50	--	<0.17	--	<0.17	--	<0.28	--	<0.28
2,2-DICHLOROPROPANE (UG/L)	ug/L	NE	NE	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.31	--	<0.31
2-HEXANONE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<7.0	--	<7.0	--	<7.0	--	<3.0	--	<3.0	--	<3.3	--	<3.3
4-METHYL-2-PENTANONE(MIBK) IN WHL WTR SAMPLE(UG/L)	ug/L	50	500	--	<6.0	--	<6.0	--	<6.0	--	<2.2	--	<2.2	--	<3.7	--	<3.7
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	1800	9000	--	<9.0	--	<9.0	--	<9.0	--	<4.0	--	<4.0	--	<4.1	--	<4.1
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.24	--	<0.24	--	<0.24	--	<0.40	--	<0.40	--	<0.47	--	<0.47
BROMOBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.60	--	<0.60	--	<0.60	--	<0.40	--	<0.40	--	<0.33	--	<0.33
BROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.80	--	<0.80	--	<0.80	--	<0.30	--	<0.30	--	<0.26	--	<0.26
BROMODICHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.06	0.6	--	<0.40	--	<0.40	--	<0.40	--	<0.29	--	<0.29	--	<0.76	--	<0.76
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	1	10	--	<0.70	--	<0.70	--	<0.70	--	<0.90	--	<0.90	--	<0.72	--	<0.72
BUTYLBENZENE, N- (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.29	--	<0.29	--	<0.34	--	<0.34
BUTYLBENZENE, SEC- (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.33	--	<0.33
BUTYLBENZENE, TERT- (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.27	--	<0.27
CARBON DISULFIDE IN WHL WATER SAMPLE (UG/L)	ug/L	200	1000	--	<0.50	--	<0.50	--	<0.50	--	<0.60	--	<0.60	--	<0.83	--	<0.83
CARBON TETRACHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.37	--	<0.37
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	20	100	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.37	--	<0.37
CHLOROETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	80	400	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<0.50	--	<1.1	--	<1.1
CHLOROFORM IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.6	6	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.46	--	<0.46
CHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	3	30	--	<0.70	--	<0.70	--	<0.70	--	<0.60	--	<0.60	--	<1.3	--	<1.3
CIS-1,2-DICHLOROETHENE, WHOLE WATER (UG/L)	ug/L	7	70	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.41	--	<0.41
CIS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.16	--	<0.16	--	<0.34	--	<0.34
DIBROMOCHLOROMETHANE IN WHOLE WATER SAMPLE (UG/L)	ug/L	6	60	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--	<0.36	--	<0.36
DIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.80	--	<0.80	--	<0.80	--	<0.22	--	<0.22	--	<0.45	--	<0.45
DICHLORODIFLUOROMETHANE IN WHOLE WTR SAMPLE (UG/L)	ug/L	200	1000	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.40	--	<0.63	--	<0.63
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.50	--	<0.50	--	<0.50	--	<0.40	--	<0.40	--	<1.2	--	<1.2
DIISOPROPYL ETHER IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.29	--	<0.29	--	<0.29	--	<0.40	--	<0.40	--	<0.26	--	<0.26
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	140	700	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.42	--	<0.42
FLUOROTRICHLOROMETHANE IN WHOLE WATER SAMPLE(UG/L)	ug/L	698	3490	--	<0.30	--	<0.30	--	<0.30	--	<0.40	--	<0.40	--	<0.41	--	<0.41
HEXACHLOROBUTADIENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.90	--	<0.90	--	<0.90	--	<0.40	--	<0.40	--	<0.57	--	<0.57
ISOPROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--	<0.39	--	<0.39
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	120	600	--	<0.50	--	<0.50	--	<0.50	--	<0.26	--	<0.26	--	<0.30	--	<0.30
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	800	4000	--	<4.0	--	<4.0	--	<4.0	--	<2.6	--	<2.6	--	<2.9	--	<2.9
METHYL TERT-BUTYL ETHER (MTBE), WHL WTR SMPL(UG/L)	ug/L	12	60	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.28	--	<0.28
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.70	--	<0.70	--	<0.70	--	<0.30	--	<0.30	--	<0.35	--	<0.35
N-PROPYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.34	--	<0.34
O-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.25	--	<0.25	--	<0.31	--	<0.31
O-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	60	600	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.36	--	<0.36
P-CHLOROTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.30	--	<0.30	--	<0.31	--	<0.31
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	15	75	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.33	--	<0.33
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NE	NE	--	<0.50	--	<0.50	--	<0.50	--	<0.30	--	<0.30	--	<0.29	--	<0.29
STYRENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	100	--	<0.50	--	<0.50	--	<0.50	--	<0.29	--	<0.29	--	<0.33	--	<0.33
TETRACHLOROETHYLENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.5	5	--	<0.50	--	<0.50	--	<0.50	--	<0.27	--	<0.27	--	<0.55	--	<0.55
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	10	50	--	<3.0	--	<3.0	--	<3.0	--	<3.0	--	<3.0	--	<3.4	--	<3.4
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	160	800	--	<0.30	--	<0.30	--	<0.30	--	<0.21	--	<0.21	--	<0.27	--	<0.27
TRANS-1,2-DICHLOROETHENE, TOTAL, IN WATER (UG/L)	ug/L	20	100	--	<0.60	--	<0.60	--	<0.60	--	<0.30	--	<0.30	--	<0.35	--	<0.35
TRANS-1,3-DICHLOROPROPENE IN WHL WTR SAMPLE (UG/L)	ug/L	NE	NE	--	<0.40	--	<0.40	--	<0.40	--	<0.23	--	<0.23	--	<0.57	--	<0.57
TRIBROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	0.44	4.4	--	<0.70	--	<0.70	--	<0.70	--	<0.40	--	<0.40	--	<0.50	--	<0.50
TRICHLOROETHYLENE (TCE) IN WHOLE WTR SAMPLE (UG/L)	ug/L	0.5	5	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.30	--	<0.39	--	<0.39
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	0.02	0.2	--	<0.19	--	<0.19	--	<0.19	--	<0.14	--	<0.14	--	<0.15	--	<0.15
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.50	--	<0.50	--	<0.50	--	<0.70	--	<0.70	--	<0.74	--	<0.74
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	400	2000	--	<0.40	--	<0.40	--	<0.40	--	<0.26	--	<0.26	--	<0.72	--	<0.72
INORGANICS																	
ALKALINITY, TOTAL FILTERED (MG/L AS CACO3)	mg/L	NE	NE	150	180	250	250	270	250	66	47	120	210	200	190	200	44
ANTIMONY, DISSOLVED (UG/L SB)	ug/L	1.2	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC, DISSOLVED (UG/L AS)	ug/L	1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BARIUM, DISSOLVED (UG/L BA)	ug/L	400	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM, DISSOLVED (UG/L BE)	ug/L	0.4	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM, DISSOLVED (UG/L CD)	ug/L	0.5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHEMICAL OXYGEN DEMAND, FILTERED (MG/L)	mg/L	NE	NE	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)(1)	mg/L	125	250	12.0	13.0	20.0	25.0	22.0	19.0	3.0	2.1	7.8	18.0	18.0	16.0	20.0	2.3
CHROMIUM, DISSOLVED (UG/L CR)	ug/L	10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COBALT, DISSOLVED (UG/L CO)	ug/L	8	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER, DISSOLVED (UG/L CU)	ug/L	130	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORIDE, DISSOLVED (MG/L F)	mg/L	0.8	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HARDNESS, TOTAL, FILTERED (MG/L AS CACO3)	mg/L	NE	NE	160	196	239	255	261	253	68.8	46.6	122	236	247	229	295	44.3
IRON, DISSOLVED (MG/L FE)	mg/L	0.15	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD, DISSOLVED (UG/L PB)	ug/L	1.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE, DISSOLVED (UG/L MN)	ug/L	60	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY, DISSOLVED (UG/L HG)	ug/L	0.2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NICKEL, DISSOLVED (UG/L NI)	ug/L	20	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NITRITE PLUS NITRATE, DIS. 1 DET. (MG/L AS N)	mg/L	2	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM, DISSOLVED (UG/L SE)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILVER, DISSOLVED (UG/L AG)	ug/L	10	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SULFATE, DISSOLVED (MG/L SO4)(1)	mg/L	125	250	9.00	9.70	10.00	9.40	7.10	6.60	3.40	3.60	4.80	6.60	6.30	6.00	6.40	2.70
THALLIUM, DISSOLVED (UG/L TL)	ug/L	0.4	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM, DISSOLVED (UG/L V)	ug/L	6	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																	
COMMENT, SAMPLE COLOR		NE	NE	<	0.0	<	0.0	<	<	0.0	<	0.0	0.0	0.0	0.0	<	0.0
COMMENT, SAMPLE ODOR		NE	NE	<	<	<	<	<	<	<	<	<	<	<	<	<	<
COMMENT, SAMPLE TURBIDITY		NE	NE	<	0.0	<	0.0	<	<	0.0	<	0.0	0.0	0.0	0.0	<	0.0
ELEVATION, GROUNDWATER (FEET ABOVE MEAN SEA LEVEL)	ft	NE	NE	1069.64	1073.90	1079.81	1085.48	1080.29	1078.48	1083.98	1082.36	1082.78	1083.11	1078.69	1073.19	1072.26	1071.89
PH, FIELD (STANDARD UNITS)	SU	NE	NE	7.72	8.10	7.17	7.64	7.45	6.43	7.66	7.38	7.46	7.47	7.08	6.95	7.42	7.16
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	NE	NE	353	410	539	551	546	510	145	97	265	485	488	478	516	98
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	NE	NE	10.10	10.09	10.15	10.15	10.65	10.19	9.29	10.37	10.19	10.32	9.71	10.32	10.57	10.02

Notes:
NE - No standard established.
-- Not analyzed.
< - Not detected above the limit of detection.
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Preventative Action Limit (PAL).
0.0 - Exceeds ch. NR 140 Public Health or Public Welfare Groundwater Quality Enforcement Standard (ES).
(1) - ch. NR 140 Public Welfare Groundwater Quality Parameter. All other parameters with groundwater standards are Public Health Standards.

Appendix R

Environmental Monitoring Plan

Environmental Monitoring and Maintenance Plan

Vernon County Landfill

Viroqua, Wisconsin

VERSW 167824 | August 23, 2023

SEH
Building a Better World for All of Us®
Engineers | Architects | Planners | Scientists

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Environmental Monitoring and Maintenance Plan

Vernon County Landfill

Prepared for Vernon County, Wisconsin

1 Introduction

This plan summarizes the environmental monitoring program and maintenance requirements for the Vernon County Landfill.

The Vernon County Landfill is a 250-acres parcel located in the Town of Viroqua, Wisconsin. The site is located in Section 15, T13N, R4W, City of Viroqua, Vernon County, Wisconsin. The site is owned by Vernon County and has been operating since 1993. The integrated waste management system includes, but is not limited to:

- An approximate 10-acre municipal solid waste landfill, with an approximate design capacity of 590,000 cubic yards (WDNR License No. 3268).
- A closed small sized (50,000 cubic yard) C&D Landfill (WDNR License No. 3712).
- A recyclable material processing and baling facility.

Figure 1, “Environmental Monitoring Plan” shows existing facility layout of the Landfill. The monitoring requirements summarized in this plan are based on the requirements outlined in Wisconsin Department of Natural Resources (WDNR) site approvals.

2 Groundwater Monitoring Well Sampling

The groundwater monitoring requirements for the Landfill are summarized within **Table 1**. Groundwater sampling and decontamination procedures will follow guidelines established by the WDNR. Groundwater samples will be collected at the frequency specified by WDNR plan approvals. Groundwater sampling involves the preparation of the groundwater monitoring wells for sampling, the collection of representative groundwater samples, analysis of the groundwater samples, comparison of the analytical results to the applicable groundwater standards, and reporting of the results to the WDNR Groundwater Environmental Monitoring Database (GEMS). Well Information Forms (WIFs) are found in **Appendix A**. The sampling procedures are outlined below:

- All sampling preparation is completed by the sampling team prior to sampling event.
- Measure water elevation: Measure the distance from the top of the monitoring well casing to the top of groundwater in the well to the nearest hundredth (0.01) of a foot, using an electronic water level indicator. Subtract the measured distance from the elevation of the top of the well casing to obtain groundwater elevation. The well casing is referenced to USGS elevation. The measurements are recorded on the field form.

- As necessary, pumps will be pulled that interfere with obtaining accurate water levels. This procedure may need to be completed 1-2 days before a water level measurement can be taken to stabilize water level in the well.
- Well Purging and Field Measurements: Wells are purged using dedicated pumps or a portable pump, decontaminated prior to use. Four well volumes of water or the amount of water to purge the well dry is removed from each well before sampling. The amount of water purged is recorded on the field form. Field tests for specific conductance, temperature, and pH are performed on an unfiltered sample in the field. The appropriate meters are used for measurements. Also, the presence of any color, turbidity, or odor in the sample is noted on the field form.
- Collect Sample: Collect the necessary sample from the monitoring well after the required volume of water has been purged. If the well is purged dry, wait for the well to recharge sufficiently to allow removal of an adequate sample volume. Typically, the volatile organic compound (VOC) samples are collected first at the wellhead, immediately upon removal of the sample from the well. Appropriate samples for indicator parameters and metals are filtered through a 0.45-micron membrane. The samples are then preserved as outlined in **Table 2**, "Analytical Parameters, Methods, and Preservatives." All samples are stored at 4° C.
- Calibration: Field measurement meters are to be calibrated daily according to manufacturer's instructions. Calibrations are to be recorded in field form or field book format.
- Equipment decontamination: All equipment used for sampling, except for dedicated well pumps and tubing, is cleaned between wells by triple rinsing with distilled/deionized water to prevent cross-contamination.
- The volume of sample needed is determined by the laboratory and is relative to the parameters being tested. Sample volume, bottle type, and preservative type listed on **Table 2** are recorded on the chain-of-custody form at the completion of each sampling event.
- Chain-of-Custody: The samples are maintained under chain-of-custody procedures throughout the sampling event. The field sampler is responsible for care, custody, and transportation of the samples to the WDNR certified laboratory.

To evaluate data quality, one duplicate groundwater sample is typically collected for each group of 10 samples. These samples are typically collected from wells which are downgradient of the facility. Field/equipment blanks will be collected and transported during groundwater sampling to evaluate decontamination procedures. One field/equipment blank for each group of 10 samples is to be collected. The field/equipment blanks are typically collected after sampling of a downgradient well. One trip blank for VOCs per cooler is to be initiated at the laboratory and transported with the sample bottles. All samples are tracked on the chain-of-custody forms.

The list of groundwater wells and parameters for the Landfill are provided on **Table 1**. The locations of groundwater wells for the Landfill are shown on **Figure 1**.

Analytical parameters will be analyzed by the laboratory in accordance with methods in the latest edition of Test Methods for Evaluating Solid Waste Physical/Chemical Methods SW 846. The parameters, analytical methods, and appropriate preservatives for the detection monitoring parameters are listed in **Table 2** and Wis. Admin. Code NR 507 Appendix I, Table 3.

Groundwater quality analyses results are provided by the laboratory in both electronic and hard copy format. The electronic data is uploaded into a data management system and reported electronically to WDNR-GEMS by the County's landfill consultant. Analytical results are reported with the limit of detection (LOD) and the limit of quantification (LOQ) for each parameter. If a substance is detected below the limit of quantification, the detected value is reported with the appropriate qualifier.

Groundwater laboratory analytical and field data are reported to WDNR-GEMS semi-annually in January and July. The GEMS submittal will also include:

- NR 140 Exceedance Notification,
- Monthly Landfill Gas Well Data,
- Semi-Annual Perimeter Gas Probe Data,
- Leachate Discharge Quantities,
- Semi-Annual Sedimentation Basin Data,
- Environmental Monitoring Data Certification Form 4400-231 (R 1/04).

3 Private Well Monitoring

One private water supply well is present on the facility property, but it is located greater than 1,200 feet from the proposed expansion area. One private water supply well is located south of the landfill property and is also greater than 1,200 feet south of the proposed expansion area. Currently, the monitoring conducted on these wells is summarized in **Table 3**.

The procedures for sampling private water supply wells are as follows:

- Flush the system from private wells as close to the pump as possible and before the water softener, water heater, or pressure tank, if possible. Purge and sample only from the cold water ports. If it is not possible to collect a sample before treatment, note this on the field form. There is usually a sample tap just prior to entering the pressure tank.
- Remove aerators, filters, or other devices from the sample tap before taking a sample.
- If the sample must be taken from an outside tap, remove any hoses before taking a sample.
- If the sample is collected on the well side of the pressure tank, make sure the pump is running and allow the water to run from the tap for at least ten minutes or four pump cycles prior to sample collection. Ensure the flowing water is cold before sampling.
- If the sample is collected on the plumbing side of the pressure tank, allow the water to run at least 20 minutes prior to sample collection to flush out water in the pressure tank and cycle the water pump. For large pressure tanks, calculate the necessary flushing time based on pressure tank volume and flow rate. Ensure the flowing water is cold before sampling.
- If not purging from sampling port, purge water supply line to sampling port to ensure a fresh representative sample is collected. Ensure the flowing water is cold before sampling.
- Make every effort possible to reduce the amount of aeration of the sample by filling the sample container with the least amount of turbulence. If the sample port has any aeration screen or strainer filter or other device remove it prior to sampling.
- Reduce the water flow to a thin stream before collecting sample for VOCs.

- Do not filter samples taken from water supply wells. Sample directly into sample containers. Sample order should be:
  - preserved vials
  - unpreserved vials
  - preserved glass bottles
  - unpreserved glass bottles
  - preserved plastic bottles
  - unpreserved plastic bottles
- Make every effort to reduce any possible sources of contamination in area of sampling port (example: remove gas containers, fertilizers, etc. from area).
- For each sampling event, the same sample port should be used.

In-field measurements, color, odor, turbidity, field pH, and field conductivity (corrected to 25˚ C) are performed on a separate unfiltered sample at the time of sampling. In-field measurements are recorded on the field form.

The private water supply wells are sampled for the parameters outlined in **Table 3**. Samples from private wells may use Method EPA 524.2 but must include additional VOCs on the Method 8260 list and NR 507 Appendix III list.

To evaluate drinking water data quality, one duplicate VOC drinking water sample is collected at each event. The duplicate sample is collected at the P-2 or “Williams” well whenever possible. Field/equipment blanks will be collected/transported during drinking water sampling to evaluate decontamination procedures. One trip blank for VOCs per cooler will be initiated at the laboratory and transported with the sample bottles. All samples are tracked on the chain of custody forms.

The results are reported to WDNR-GEMS semi-annually with the environmental monitoring data for the Active MSW Landfill (License #3268).

4 Surface Water Monitoring

Surface water from the landfill flows into a sedimentation basin located southeast of the Active MSW Landfill, as shown on **Figure 1**.

A surface water sample will be collected at the inspection point (Sedimentation Basin) semi-annually for analysis of parameter identified in **Table 4**.

All analytical parameters collected semi-annually shall be collected as a grab direct immersion sample. Pond samplers, pumps, boats, hip boots, waders, and other water sampling devices may be required to collect a surface water or stormwater sample safely. A direct immersion sampling method shall be implemented for sample collection whenever possible and is described below.

- Don appropriate health and safety equipment.
- Obtain the required sample container(s).
- If entering the water body, always do so with as little bottom disturbance as possible and wait for the water around the planned sampling area to return to its undisturbed state (clarity) before sampling.

- Collect each liquid sample by slowly submerging the sample container with minimal surface disturbance. If sampling in a stream or current, make sure the open end of the sample container is pointed upstream.
- Retrieve the container from the liquid with minimal disturbance; cap and wipe the outside of the container with a towel or cloth.

The surface water monitoring results will be reported to WDNR-GEMS semi-annually with the environmental monitoring data for the Active MSW Landfill (License #3268).

5 Leachate Monitoring Program

5.1 Leachate Sampling Points

The leachate collection system for the Active MSW Landfill (License #3268), drains to leachate storage tank located near the southwest side of the property. Additional design and configuration detail information for the leachate system is located in **Appendix B**, “Leachate Figures”.

5.2 Leachate Quality

Leachate operation monitoring requirements are to be in accordance with Chapter NR 507. Monitoring requirements are summarized on **Table 5**, “Leachate and Lysimeter Monitoring Requirements.” The locations of leachate monitoring points are shown on **Figure 1**.

Grab samples are collected from the leachate storage tank (WDNR Point ID 300). A representative grab sample will be collected using a composite sampler, bailer or similar method. These samples will be collected semi-annually in the months of March and September.

During collection of the unpreserved sample, field pH and field specific conductance are to be measured. Additionally, the color, turbidity, and odor of the sample are noted. All field measurements are recorded on the field form. Leachate quantities are recorded monthly and reported semi-annually with the leachate quality data.

Reporting of the semi-annual monitoring for the landfill to the WDNR-GEMS database will be completed on a semi-annual basis.

5.3 Leachate Head

Leachate head monitoring is conducted at the Active MSW Landfill (License #3268), in accordance with the schedule outlined on **Table 5**. **Figure 1** shows the location of the leachate head monitoring wells for the above reference sites.

A Plan modification was submitted to the WDNR on October 2, 2020, proposing the revised leachate monitoring system that is summarized on **Table 5**. This modification proposed to monitor leachate cleanout location CO-3S, CO-7S, CO-3N, and CO-6N instead of damaged or missing leachate wells LHW-1, LHW-2, LHW-3, and LHW-4. This proposed plan modification was approved by the WDNR in a letter dated February 9, 2021.

When measuring the liquid elevation at the leachate cleanouts, the elevation must be adjusted by 18-inches to reflect leachate head elevation on the liner versus the leachate collection trend. Leachate quantities pumped are recorded monthly with the leachate quality data. Reporting leachate head volumes for Active MSW Landfill (License #3268) to WDNR-GEMS database is included in the semi-annual GEMS submittal.

6 Landfill Gas Monitoring

The landfill gas (LFG) monitoring network consists of LFG monitoring probes located on the perimeter of the Active MSW Landfill (License #3268). The location of LFG probes are shown on **Figure 1**.

6.1 LFG Monitoring

LFG probe monitoring is conducted in accordance with the Plan of Operation as specified on **Table 6**, "Landfill Gas Monitoring". Gas probes will be monitored using a handheld combustible gas meter, i.e., LANDTEC GEM 5000. Each probe will be monitored semi-annually for percent methane and percent oxygen. Site conditions will also be required at the time of gas monitoring which includes monitoring of ambient temperature, barometric pressure, barometric pressure trend, and ground surface conditions. The data results from LFG probes are reported to the WDNR semi-annually. The location of LFG monitoring points are shown on **Figure 1**, "LFG Monitoring Plan."

Once final closure occurs, the LFG produced by the Active MSW Landfill (License #3268) will be extracted and conveyed to a blower and flare system. Future LFG extraction monitoring is summarized on **Table 7**, "Landfill Gas Extraction System Monitoring Requirements". Data will be collected from the LFG extraction blower twice monthly while it is operating. The blower inlet, blower outlet, and flare data are reported under WDNR Point ID 400 through 402, respectively. The data results from the LFG extraction points will be reported to the WDNR semi-annually.

7 Inspection and Maintenance Requirements

The Landfill Operations Coordinator, or designee, conducts daily, weekly, and monthly of all active and closed landfill areas. Inspection and maintenance requirements for the Landfill are shown on **Table 8**, "Inspection and Maintenance Requirements." Results of the inspections are documented on inspection logs and retained by the Landfill Operations coordinator.

The inspections will include but not be limited to review of the following:

- Site Conditions shall be noted for:
  - Weather conditions and station data.
  - Dust/Water application volume.
  - Odors.
- Intermediate and final cover shall be inspected, and observations of the following noted:
  - Growth of vegetation and presence of any bare spots.
  - Erosion of the waste slope and/or intermediate cover.
  - Sloughing or slumping of the waste face or intermediate cover.
  - Presence of any leachate seeps.
  - Evidence of gas leakage through the cover.
- Leachate management system shall be checked for:
  - Leachate extraction wells working.
  - Building inspection.
  - Integrity of the leachate transfer piping.

  - Sedimentation/clogging in the leachate manhole.
  - Proper operation of the leachate pump including manufacturer's recommended periodic maintenance.
  - SCADA and leachate totals.
- Surface water management structures shall be checked for:
  - Integrity of surface water and erosion control devices.
  - Siltation or sedimentation in surface water conveyance structure.
  - Erosion in and/or around surface water conveyance structure.
- Operating gas and leachate management system on the Landfill shall be:
  - SCADA and gas monitor operation and calibration.
  - LFG quality measurements.

The Landfill Operations Manager, or designee, shall take action within 48 hours to correct any deficiency on any of the listed structures. The corrective action shall return the damage structure to its original condition or better.

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Tables

Table 1 – Groundwater Monitoring Requirements
Table 2 – Analytical Parameters, Methods, and Preservatives
Table 3 – Private Water Supply Well Monitoring
Table 4 – Surface Water Monitoring
Table 5 – Leachate and Lysimeter Monitoring Requirements
Table 6 – Landfill Gas Probe Monitoring
Table 7 – Landfill Gas Extraction System Monitoring Requirements
Table 8 – Inspection and Maintenance Requirements

Table 1
Groundwater Monitoring Requirements
Vernon County Landfill (License # 3268)

WELL ID	DNR ID	Grid Location		GW Elevation 04189	Odor 00001	Color 00002	Turbidity 00003	Field Temp. 00010	Field Conductivity 00094	Field pH 00400	Chloride 00940	Total Hardness 22413	Alkalinity 39036	Dissolved Iron 74010	VOCs[1]
		Northing	Easting												
MW-1	101	1745979.0	582815.9	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-1R	120	1745703.8	582940.9	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-1P	102	1745957.4	582809.9	SA	SA	SA	SA	SA	SA	SA	--	--	--	--	--
MW-1RZ	123	1745693.7	582922.0	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-1PR[2]	121	1745694.9	582942.0	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-2	103	1745492.1	583625.4	SA	SA	SA	SA	SA	SA	SA	--	--	--	--	--
MW-2P	104	1745476.6	583625.5	SA	SA	SA	SA	SA	SA	SA	--	--	--	--	--
MW-3	105	1746427.5	584086.5	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-4P	107	1746438.4	584086.3	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-5[3]	108	1746588.2	583468.0	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-5A[2,3]	109	1746571.9	583467.9	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-6	110	1746417.5	584086.7	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-7	111	1745887.8	583843.8	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-8R	112	1745874.2	583837.0	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-9[2]	113	1745892.3	583858.6	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-10	114	1746433.2	582822.1	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-11	115	1746432.0	582806.2	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-12[2]	116	1746413.0	582806.6	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-13P	117	1746035.6	582910.5	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-14[3]	118	1746475.7	583881.3	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-14Z[3]	119	1746488.0	583867.0	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-14WT	125	1746693.1	583964.8	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-15WT	127	1746728.6	583598.0	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-16WT[2]	129	1746673.4	583157.4	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-16	131	1746669.7	583147.8	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-17WT2	133	1746684.9	582907.9	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-5R[4]	TBD	Future	Future	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
MW-5AR[2,4]	TBD	Future	Future	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-14R[4]	TBD	Future	Future	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A

SA = Semi Annual Monitoring (March and September).

A= Annual Monitoring (September).

1. VOCs within ch. NR 507, Appendix III, including acetone, carbon disulfide, methyl ethyl ketone, and tetrahydrofuran.

2. Subtitle "D" Wells.

3. Well will need to be abandoned during proposed expansion construction. Sampling will occur until well is abandoned.

4. Proposed replacement monitoring wells to be installed when exisiting monitoring wells MW-5, MW-5A, MW-14, and MW-14Z are abandoned due to proposed expansion construction.

Table 2
Analytical Parameters, Methods, and Preservatives
Vernon County Landfill (License # 3268)

Parameter	Minimum Sample Size	Container	Preservative[1]	Method
Volatile Organic Compounds	120 ml	GV40T	HCL	EPA 8021, 8260
Alkalinity	100 ml	P or G	---	EPA 310.2
Antimony	250 ml	P or G	HNO3, pH <2	EPA 200.9
Arsenic	250 ml	P or G	HNO3, pH <2	EPA 200.9
Barium	250 ml	P or G	HNO3, pH <2	EPA 6010
Beryllium	250 ml	P or G	HNO3, pH <2	EPA 6010
Biochemical Oxygen Demand (BOD)	100 ml	P or G	---	SM5210B
Boron	250 ml	P or G	HNO3, pH <2	EPA 6020
Cadmium	250 ml	P or G	HNO3, pH <2	EPA 6020
Chemical Oxygen Demand (COD)	50 ml	P or G	HNO3, pH <2	EPA 410.4, 5220B
Chloride	50 ml	P or G	---	EPA 300.0
Chromium	250 ml	P or G	HNO3, pH <2	EPA 6010
Cobalt	250 ml	P or G	HNO3, pH <2	EPA 6010
Color	---	---	---	---
Conductivity (Field)	---	---	---	---
Copper	250 ml	P or G	HNO3, pH <2	EPA 6010
Fluoride	250 ml	P or G	---	EPA 340.2
Groundwater Elevation	---	---	---	---
Hardness	50 ml	P or G	---	EPA 6010
Iron	250 ml	P or G	HNO3, pH <2	EPA 6010
Lead	250 ml	P or G	HNO3, pH <2	EPA 6020
Manganese	250 ml	P or G	HNO3, pH <2	EPA 6010
Mercury	50 ml	P or G	HNO3, pH <2	EPA 245.1
Nickel	250 ml	P or G	HNO3, pH <2	EPA 6010
Nitrate + Nitrite (NO3+NO2)	50 ml	P or G	---	EPA 3531
Odor	---	---	---	---
pH (Field)	---	---	---	---
Selenium	250 ml	P or G	HNO3, pH <2	EPA 6020
Silver	250 ml	P or G	HNO3, pH <2	EPA 6010
Sodium	250 ml	P or G	HNO3, pH <2	EPA 200.7
Sulfate	250 ml	P or G	---	EPA 300.0
Temperature (Field)	---	---	---	EPA 170.1, 2550 B
Thallium	250 ml	P or G	HNO3, pH <2	EPA 200.9
Total Kjeldahl Nitrogen	250 ml	P or G	H2SO4, pH <2	SM 4500-NH3E
Total Suspended Solids	250 ml	P or G	---	USGS I-3765
Turbidity	---	---	---	---
Vanadium	250 ml	P or G	HNO3, pH <2	EPA 6010
Zinc	250 ml	P or G	HNO3, pH <2	EPA 6010

1. All samples must be cooled to 4 C.
GV 40T - 40 ml glass vial with teflon cap
G = Glass
P = Plastic

Table 3
Private Water Supply Well Monitoring
Vernon County Landfill (License # 3268)

Private Water Supply WELL ID	DNR ID	Color 00002	Odor 00001	Turbidity 00003	Field Temp. 00010	Field pH 00400	Field Conductivity 00094	Alkalinity, total 39036	Total Hardness 22413	Chloride 00940	VOCs[1]
Facility Well (P-1)	201	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Williams Well (P-2)	202	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA

SA = Semi Annual Monitoring (March and September).
1. Samples from private wells may use Method EPA 524.2, but must include additional VOCs on Method EPA 8260 list and NR507 Appendix III list.

Table 4
Surface Water Monitoring
Vernon County Landfill (License # 3268)

Sample Point	DNR ID	Surface Water Elevation 99520	Dissolved Oxygen 299	Odor 00001	Color 00002	Turbidity 00003	Field Temp. 00010	Field Cond 00094	Field pH 00400	Total Alkalinity 00410	Chloride 00940	Total Iron 74010	Filtered Nitrate 00620	Total Phosphorous 00665	Total Hardness 00900
Sedimentation Basin	502	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA

SA = Semi Annual Monitoring (March and September).

Table 5
Leachate and Lysimeter Monitoring Requirements
Vernon County Landfill (License # 3268)

Sample Point	DNR ID	Grid Location		Volume Removed		Depth of Leachate	Leachate Head Elevation	Depth to Liquid	Liquid Elevation	Odor	Color	Turbidity	BOD	Field Cond	Field pH	Total Susp Solids	TKN	Total NH3	Total Alkalinity	Total Cadmium	Total Chloride	Total Hardness	Total Iron	Total Lead	Total Manganese	Total Mercury	Total Sodium	Total Sulfate	VOCs[1]	SVOCs[2]
		Northing	Easting	Lysimeter	Leachate																									
				74064	00032	00031	00023	72002	99423	00001	00002	00003	00310	00094	00400	00150	00625	00610	00410	01027	00940	00900	74010	01051	01055	71900	00929	00945		
Leachate Storage Tank	300	1745623.3	583001.682	--	M	--	--	--	--	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A
Lys-1	340	1745918.79	582940.41	M	--	--	--	M	SA	SA	SA	SA	--	SA	SA	--	SA	--	SA	--	SA	SA	--	--	--	--	SA	SA	A	A
Lys-3	342	1746261.9	582893.0	M	--	--	--	M	SA	SA	SA	SA	--	SA	SA	--	SA	--	SA	--	SA	SA	--	--	--	--	SA	SA	A	A
CO-3S	331	1745938.82	583031.843	--	M	M	M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CO-7S	332	1746138.75	583027.563	--	M	M	M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CO-3N	333	1745920.51	583698.75	--	M	M	M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CO-6N	334	1746072.28	583780.511	--	M	M	M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LCH-5[3]	335	1746365.69	583124.42	--	M	M	M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LCH-6[3]	336	1746372.42	583461.234	--	M	M	M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LCH-7	TBD	Future	Future	--	M	M	M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LCH-8	TBD	Future	Future	--	M	M	M																							
CO-9S	TBD	Future	Future	--	M	M	M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1. VOCs within ch. NR 507, Appendix III, including acetone, carbon disulfide, methyl ethyl ketone, and tetrahydrofuran.
2. SVOCs within ch. NR 507, Appendix IV.
3. To be abandoned during proposed expansion construction. Sampling will occur until location is abandoned.
M- Monthly SA - Semiannually
A - Annually

Table 6
Landfill Gas Probe Monitoring
Vernon County Landfill (License # 3268)

Sample Point	DNR #	Grid Location		Gas Quality		Field Temperature	Barometric Pressure	Barometric Pressure Trend	Ground Surface Condition
				Methane	Oxygen				
		Northing	Easting	%	%	F	mm of HG		
				85547	85550	46388	00025	46381	
Reported under Active MSW Landfill (License #3253)									
GP-1	460	1745680.9	583357.5	Q	Q	Q	Q	Q	--
GP-2R	463	1745951.2	583821.3	Q	Q	Q	Q	Q	--
GP-3	464	1746000.7	582918.3	Q	Q	Q	Q	Q	--
GP-4	TBD	Future	Future	Q	Q	Q	Q	Q	--

Q = Quarterly Monitoring (March, June, September, and December).

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Table 7
Landfill Gas Extraction System Monitoring Requirements
Vernon County Landfill (License # 3268)

Sample Point	DNR ID #	Coordinates		Gas Quality				Vacuum	Pressure	Header Pressure	Field Temperature F	Flow Rate
				Carbon Dioxide	Methane	Nitrogen	Oxygen					
		Northing	Easting	%	%	%	%	" H2O		" H2O		
				85544	85547	99181	85550	46390	46382	46382	46388	46386
Blower Inlet	400	Future	Future	Mx2	Mx2	Mx2	Mx2	Mx2	Mx2	--	Mx2	Mx2
Blower Outlet	401	Future	Future	Mx2	Mx2	Mx2	Mx2	Mx2	Mx2	--	Mx2	Mx2
Flare	402	Future	Future	--	--	--	--	--	--	Mx2	--	Mx2
GW-1	410	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-2	412	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-3	414	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-4	416	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-5	418	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-6	420	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-7	422	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-8	424	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-9	426	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-10	428	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-11	430	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-12	TBD	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-13	TBD	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-14	TBD	Future	Future	--	Q	--	Q	--	--	Q	Q	Q
GW-15	TBD	Future	Future	--	Q	--	Q	--	--	Q	Q	Q

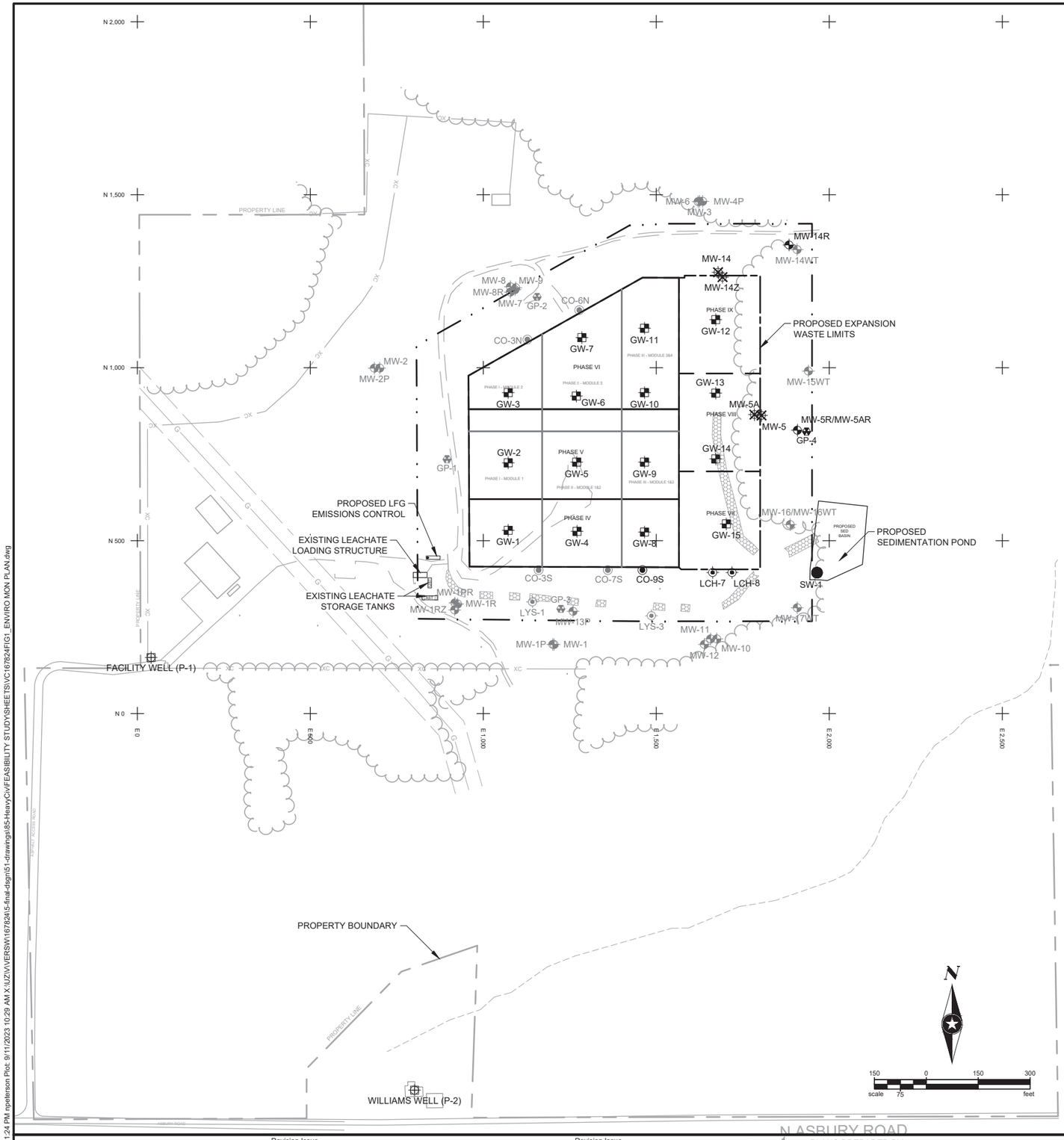
Mx2 = Twice Monthly M = Monthly
Q = Quarterly A = Annually
1. Required at the time of any gas monitoring.

Table 8
Inspection and Maintenance Requirements
Vernon County Landfill (License # 3268)

Location	Inspection Schedule	Maintenance Schedule
Cover Vegetation	Semi-Annually	Maintain Healthy Vegetative Growth, Repair as Necessary
Cover Vegetation	Annually	Mow Cover
Runoff Control Strucutres	Semi-Annually	Inspect for Erosion and Sedimentation, Repair as Necessary
Cap Settlement	Semi-Annually	Check for Cap Settlement, Repair as Necessary
Road Repair	Semi-Annually	Inspect Roads, Repair as Necessary
Gas Extraction System	Monthly	Inspect Wells, Blower, Piping, etc.
Leachate Collection System	Semi-Annually	Inspect Lift Station, Pumps, Tank, Loading Structure, Cleanout Riser, etc.
Leachate Collection System	Annually	Clean out Leachate Lines
Lysimeters	Semi-Annually	Inspect Sampling Ports and Manholes
Groundwater Monitoring Wells	Semi-Annually	Inspect Surface Seal, Protective Casing/Cover, Lock, Well Casing, Labels, Cap, Bailer Fit, etc.
Groundwater Monitoring Wells	Annually	Measure Well Depth
M = Monthly	SA - Semi-Annually	
A = Annually		

Figures

Figure 1 – Environmental Monitoring Plan



LEGEND:

EXISTING:

MW-15WT	GROUNDWATER MONITORING WELL
FACILITY WELL (P-1)	PRIVATE GROUNDWATER WELL
LHW-5	LEACHATE HEAD WELL
CO-3N	CLEANOUT (HEAD WELL)
LYS-1	LYSIMETER
GP-3	GAS PROBE

PROPOSED:

MW-X	GROUNDWATER MONITORING WELL
MW-5	GROUNDWATER MONITORING WELL (TO BE ABANDONED)
LHW-7	LEACHATE HEAD WELL
GP-4	GAS PROBE
GW-15	LANDFILL GAS MONITORING/EXTRACTION WELL
SW-1	SURFACE WATER SAMPLING LOCATION

GENERAL:

	150-FT DESIGN MANAGEMENT ZONE (DMZ)
	APPROXIMATE PROPERTY BOUNDARY
	EXISTING APPROVED WASTE LIMITS
	PROPOSED EXPANSION WASTE LIMITS
	PROPOSED SEDIMENTATION BASIN LIMITS
	PROPOSED FLARE LOCATION
	EXISTING LEACHATE STORAGE TANK

Groundwater Monitoring Wells/Piezometers

Well ID	Parameters		Sample Interval
Existing Wells: MW-1, MW-1R, MW-1RZ, MW-3, MW-4P, MW-5, MW-6, MW-7, MW-8R, MW-10, MW-11, MW-13P, MW-14, MW-14Z, MW-14WT, MW-15WT, MW-16	Groundwater Elevation	SA	March & September
	Field pH	SA	
	Field Conductivity	SA	
	Field Temperature	SA	
	Diss. Alkalinity	SA	
	Diss. Chloride	SA	
	Total Hardness	SA	
	Color, Odor, Turbidity	SA	
	Dissolved Iron	SA	
Proposed Wells[1]: MW-5R, MW-14R	VOCs	A	September
Existing Wells: MW-1P, MW-2, MW-2P	Groundwater Elevation	SA	March & September
	Field pH	SA	
	Field Conductivity	SA	
	Field Temperature	SA	
	Color, Odor, Turbidity	SA	
Existing Subtitle D Wells: MW-1PR, MW-5A, MW-9, MW-12, MW-16WT, MW-17WT	Groundwater Elevation	SA	March & September
	Field pH	SA	
	Field Conductivity	SA	
	Field Temperature	SA	
Proposed Subtitle D Wells[1]: MW-5AR	Diss. Alkalinity	SA	
	Diss. Chloride	SA	
	Total Hardness	SA	
	Color, Odor, Turbidity	SA	
	Dissolved Iron	SA	
	VOCs	SA	
Proposed to be Abandoned Wells: MW-5, MW-5A, MW-14, MW-14Z			

1. Proposed replacement monitoring wells to be installed when existing monitoring wells MW-5, MW-5A, MW-14, MW-14Z are abandoned due to proposed expansion construction.

Private Wells

Well ID	Parameters		Sample Interval
Facility Well (P-1), Williams Well (P-2)	Field pH	SA	March & September
	Field Conductivity	SA	
	Field Temperature	SA	
	Color, Odor, Turbidity	SA	
	Diss. Alkalinity	SA	
	Diss. Chloride	SA	
	Total Hardness	SA	
	VOCs	SA	

Leachate

Monitoring Points	Parameters		Sample Interval
Leachate Head Wells: CO-3S, CO-3N, LCH-5, CO-7S, CO-6N, LCH-6; Proposed Leachate Head Wells: LCH-7, LCH-8, CO-9S	Leachate Volume Pumped	M	Monthly
	Leachate Elevation	M	
	Leachate Depth	M	
Proposed to be Abandoned Head Wells: LCH-5, LCH-6			
Leachate Storage Tank	Leachate Volume Pumped	M	Monthly
	BOD	SA	March & September
	Total Ammonia Nitrogen	SA	
	Field pH	SA	
	Field Conductivity	SA	
	Total Alkalinity	SA	
	Total Chloride	SA	
	Total Suspended Solids	SA	
	Total Hardness	SA	
	Total Sulfate	SA	
	Total Sodium	SA	
	Total Cadmium	SA	
	Total Iron	SA	
	Total Lead	SA	
	Total Manganese	SA	
	Total Mercury	SA	
	Total Kjeldahl Nitrogen	SA	
	Color, Odor, Turbidity	SA	
	VOCs	SA	
	SVOCs	A	September

LFG Monitoring

Monitoring Points	Parameters		Sample Interval
Existing Gas Monitoring Wells: GP-1, GP-2R, GP-3	% Methane	Q	March, June, September, and December
	% Oxygen	Q	
	Field Temperature	Q	
	Barometric Pressure	Q	
	Barometric Pressure Trend	Q	
Proposed Gas Monitoring Wells: GP-4	% Methane	Q	March, June, September, and December
	% Oxygen	Q	
	Field Temperature	Q	
	Barometric Pressure	Q	
	Barometric Pressure Trend	Q	
Proposed LFG Extraction Wells: GW-1, GW-2, GW-3, GW-4, GW-5, GW-6, GW-7, GW-8, GW-9, GW-10, GW-11, GW-12, GW-13, GW-14, GW-15	Header Pressure in Water Column	M	March, June, September, and December
	% Methane	Q	
	% Oxygen	Q	
	Field Temperature	Q	
	Flow Rate	Q	
Proposed LFG System: Blower Inlet, Blower Outlet	% Methane	Mx2	Twice Monthly
	% Oxygen	Mx2	
	% Carbon Dioxide	Mx2	
	% Nitrogen	Mx2	
	Vaccum (in H2O)	Mx2	
	Pressure	Mx2	
	Field Temperature	Mx2	
	Flow Rate	Mx2	
Flare	Head Pressure (in H2O)	Mx2	Twice Monthly
	Flow Rate	Mx2	

Lysimeters

Monitoring Points	Parameters		Sample Interval
Lys-1, Lys-3	Lysimeter Discharge (gallons)	M	Monthly
	Depth to Liquid	M	
	Liquid Elevation	SA	March & September
	Field pH	SA	
	Field Conductivity	SA	
	Total Alkalinity	SA	
	Total Chloride	SA	
	Total Hardness	SA	
	Total Sodium	SA	
	Total Sulfate	SA	
	Total Kjeldahl Nitrogen	SA	
	Color, Odor, Turbidity	SA	
	VOCs	A	September
	SVOCs	A	

Surface Water Monitoring

Monitoring Points	Parameters		Sample Interval
Sedimentation Basin (SW-1)	Surface Water Elevation	SA	March & September
	Dissolved Oxygen	SA	
	Field pH	SA	
	Field Conductivity	SA	
	Field Temperature	SA	
	Total Alkalinity	SA	
	Total Chloride	SA	
	Total Hardness	SA	
	Total Iron	SA	
	Filtered Nitrate	SA	
	Total Phosphorous	SA	
	Color, Odor, Turbidity	SA	

Operation and Maintenance Activities

Location	Inspection Schedule	Maintenance Schedule
Cover Vegetation	Semi-Annually	Maintain Healthy Vegetative Growth, Repair as Necessary
Cover Vegetation	Annually	Mow Cover
Runoff Control Strucutres	Semi-Annually	Inspect for Erosion and Sedimentation, Repair as Necessary
Cap Settlement	Semi-Annually	Check for Cap Settlement, Repair as Necessary
Road Repair	Semi-Annually	Inspect Roads, Repair as Necessary
Gas Extraction System	Monthly	Inspect Wells, Blower, Piping, etc.
Leachate Collection System	Semi-Annually	Inspect Lift Station, Pumps, Tank, Loading Structure, Cleanout Riser, etc.
Leachate Collection System	Annually	Clean out Leachate Lines
Lysimeters	Semi-Annually	Inspect Sampling Ports and Manholes
Groundwater Monitoring Wells	Semi-Annually	Inspect Surface Seal, Protective Casing/Cover, Lock, Well Casing, Labels, Cap, Bailer Fit, etc.
Groundwater Monitoring Wells	Annually	Measure Well Depth

Save: 8/30/2023 1:24 PM npeterson Plot: 9/11/2023 10:29 AM X:\UZ\V\VERSW\167824\5-final-dsgn\51-drawings\85-HeavyCiv\FEASIBILITY STUDY\SHEETS\VC167824FIG1_ENVIRO MON PLAN.dwg

		Rev.#	Revision Issue Description	Date	Rev.#	Revision Issue Description	Date
SEH Project	VERSW 167824	.			.		
Drawn By	NRP	.			.		
Designed By	TTR	.			.		
Checked By	DRH	.			.		

PLANS PREPARED BY:
SEH
329 JAY STREET
SUITE 301
LA CROSSE, WI 54601-4034
PHONE: 1.608.782.3161

PLANS PREPARED FOR:
VERNON COUNTY SOLID WASTE DEPT
53705 CTH LF
VIROQUA, WISCONSIN

VERNON COUNTY LANDFILL

ENVIRONMENTAL MONITORING PLAN

FIG1
of 1

Appendix A

Well Information Forms

State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

GROUNDWATER MONITORING WELL AND POINT INFORMATION

Form 4400-089 (R 04/19)

Use the Groundwater Monitoring Well and Point Information Form to record identification, location and construction information for groundwater monitoring wells and any other sample "points," (e.g., gas probes, lysimeters, leachate collection systems, etc.), that are part of the environmental monitoring program. **NOTE:** Not all fields will be applicable to all point types. Only **one** coordinate reference system may be used per site. Allowable coordinate systems are listed below. (Coordinates for each system require a minimum number of digits as described below.) Local grid coordinates cannot be accepted. Identify the Coordinate Reference System, Datum and Method used.

Facility Name	County	Facility ID No. (FID)	License, Permit or Monitoring No.	Date	Completed By (Name and Firm)
Vernon County MSW Landfill	Vernon	663038310	3268	04/11/2023	Brian Kent, SEH

DNR Point ID No.	Point Name[1]	WUWN[2] (if app.)	Type	Status	Gradient	*Enf. Stds. Y/N.*	Construction Date	Elevations msl (ft)		Well Casing			Well Screen Length (ft)	Well (Pt) Total Length[5] (ft)	Coordinates[6,7,8,9]	
								Ground Surface	Well Top (of casing)	Type	Diam[3] (in)	Length[4] (ft)			Y / Lat / Northing	X / Long / Easting
102	MW-1P		11	A			12/30/1987	1236.4	1238.41	P	2	101.1	10	111.1	1745957.3	582809.9
101	MW-1		12	A			12/30/1987	1236.4	1238.11	P	2	148.0	10	158.0	1745978.9	582815.9
121	MW-1PR		11	A			01/12/1994	1245.0	1247.61	P	2	112.7	15	127.7	1745694.8	582942.0
120	MW-1R		12	A			01/12/1994	1244.6	1247.25	P	2	149.6	15	164.6	1745703.8	582940.8
123	MW-1RZ		12	A			03/12/2003	1244.0	1245.45	P	2	181.5	5	186.5	1745693.6	582921.9
104	MW-2P		11	A			01/17/1988	1252.5	1254.88	P	2	114.8	10	124.8	1745476.5	583625.4
103	MW-2		12	A			01/17/1988	1252.5	1254.35	P	2	164.6	10	174.6	1745492.0	583625.4
105	MW-3		12	A			02/02/1988	1233.0	1235.25	P	2	175.0	5	180.0	1746427.4	584086.5
107	MW-4P		11	A			01/29/1988	1232.9	1235.19	P	2	85.0	10	95.0	1746438.4	584086.2
109	MW-5A		11	A			11/08/1989	1224.0	1225.18	P	2	88.3	15	103.3	1746571.9	583467.8
108	MW-5		12	A			02/17/1988	1223.3	1225.32	P	2	140.6	10	150.6	1746588.2	583467.9
110	MW-6		12	A			02/20/1988	1233.0	1235.37	P	2	197.2	5	202.2	1746417.4	584086.7
111	MW-7		12	A			11/07/1989	1255.7	1258.03	P	2	229.5	5	234.5	1745887.7	583843.8
112	MW-8R		12	A			11/13/1989	1256.1	1258.84	P	2	187.5	15	202.5	1745874.1	583836.9
113	MW-9		11	A			08/29/1989	1255.4	1257.50	P	2	111.8	15	126.8	1745892.2	583858.6
114	MW-10		12	A			09/15/1989	1215.6	1217.52	P	2	178.5	5	183.5	1746433.1	582822.1
115	MW-11		12	A			09/22/1989	1216.4	1218.36	P	2	147.5	15	162.5	1746431.9	582806.2
116	MW-12		11	A			09/22/1989	1216.4	1218.36	P	2	83.5	15	98.5	1746413.0	582806.6
117	MW-13P		11	A			02/26/2003	1224.5	1227.42	P	2	87.4	15	102.4	1746035.5	582910.4
118	MW-14	JX072	12	A			03/12/2003	1247.5	1249.69	P	2	171.1	15	186.1	1746475.7	583881.3
119	MW-14Z	JX073	12	A			03/07/2003	1247.5	1250.22	P	2	205.8	5	210.8	1746488.0	583866.9
125	MW-14WT	WC334	11	A			09/20/2022	1247.2	1249.70	P	2	90.0	15	105.0	1746693.0	583964.7
127	MW-15WT	WC335	11	A			09/28/2022	1220.6	1223.24	P	2	72.8	10	82.8	1746728.6	583598.0

GROUNDWATER MONITORING WELL AND POINT INFORMATION

Form 4400-089 (R 04/19)

DNR Point ID No.	Point Name[1]	WUWN[2] (if app.)	Type	Status	Gradient	*Enf. Stds. Y/N.*	Construction Date	Elevations msl (ft)		Well Casing			Well Screen Length (ft)	Well (Pt) Total Length[5] (ft)	Coordinates[6,7,8,9]	
								Ground Surface	Well Top (of casing)	Type	Diam[3] (in)	Length[4] (ft)			Y / Lat / Northing	X / Long / Easting
129	MW-16WT	WC336	11	A			09/21/2022	1184.7	1187.41	P	2	64.9	10	74.9	1746673.3	583157.3
131	MW-16	WC337	12	A			08/25/2022	1184.3	1186.92	P	2	91.9	5	96.9	1746669.6	583147.8
133	MW-17WT	WC338	11	A			09/26/2022	1196.4	1199.18	P	2	76.9	10	86.9	1746684.9	582907.9
FU046	P-1 (Facility)	201	13	A			12/10/1992			S	6					
8IW730	P-2 (Williams)	202	13	A			07/10/1969			S	6					
	Sedimentation Basin	502	22	A												
	Leachate Storage Tank	300	23	A											1745623.2	583001.6
	Lys-1	340	14	A											1745918.7	1745918.7
	Lys-2	341	14	A											1746103.3	582916.5
	Lys-3	342	14	A											1746261.9	582892.9
	LHW-1	310	24	P											1745934.8	583130.8
	LHW-2	314	24	P											1745941.7	583452.2
	LHW-3	318	24	P											1746129.7	583120.3
	LHW-4	322	24	P											1746077.0	583793.7
	LHW-5	326	24	A											1746365.6	583124.4
	LHW-6	330	24	A											1746372.4	583461.2
	CO-3S	331	24	A											1745938.8	583031.8
	CO-7S	332	24	A											1746138.8	583027.6
	CO-3N	333	24	A											1745920.5	583698.8
	CO-6N	334	24	A											1746072.3	583780.5
	GP-1	460	51	A											1745680.9	583357.5
	GP-2	462	51	A											1745951.2	583821.2
	GP-3	464	51	A											1746000.6	582918.3

GROUNDWATER MONITORING WELL AND POINT INFORMATION

[1] Include previous name as well if one exists.

[2] Wisconsin Unique Well Number.

[3] Well Casing Diameter measures inside diameter.

[4] Length of well casing from top of casing to top of screen.

[5] Total length of well from top of casing to bottom of well. *Should equal sum of well casing length and screen length.*

[6] Identify Coordinate Reference System (only one system may be used per site):

- ◯ Lat/Long (Decimal Degrees) WGS84 (min. 8 digits total w/ 6 right of decimal, e.g., -89.123456)

State Plane (min. 2 digits right of decimal)

- ◯ North
- ◯ Central
- ⊗ South
- ◯ Wisc. Transverse Mercator WTM91 (min. 2 digits right of decimal)
- ◯ Local County Coord. Sys. (WISCRS) (min. digits vary by county)

[7] Identify Projection Datum and units*

- ◯ NAD83
- ◯ NAD27
- ◯ NAD83(91)
- ⊗ NAD83(11)
- ◯ Other Describe: _____

Units used for State Plane, WTM or County Coord. Sys:

- ◯ meters
- ◉ feet

*NOTE: A datum and units are not required for Lat/Long

[8] Identify the Method Used to Determine the Coordinates:

- ⊗ GPS001-Survey grade
- ◯ GPS003-Mapping grade/real-time differential correction
- ◯ GPS004-Mapping grade/post processing
- ◯ SRV001-Classical terrestrial surveying techniques
- ◯ OTH001 (Other), Describe:

[9] Y / Lat / Northing describe the vertical axis.

X / Long / Easting describe the horizontal axis.

(include "-" where needed, e.g., -89.123456)

Remarks:

Completion of this form is mandatory under chs. 281, 289 and 292, Wis. Stats., and ss. NR 110.25, NR 507.14 and NR 716.15, Wis. Admin. Code

INSTRUCTIONS FOR COMPLETING THE GROUNDWATER MONITORING WELL AND POINT INFORMATION FORM (#4400-089)

When completed, this form provides a record of information for each well or sampling point that is part of a facility's environmental monitoring program. It provides the facility or consultant with a means of presenting point information required by the Department in a consistent format. This form should be updated as new points are added to the monitoring program or new information becomes available (e.g., re-surveyed elevation for existing points).

Complete the form with the necessary information as described below:

Facility Name: Enter the name of the site or landfill.

County: Enter the county the site or landfill is located.

Facility ID Number (FID): Enter the 9-digit Facility ID (FID) assigned to the site.

License/Permit/Monitoring Number: Enter the number assigned by the Department to the facility. If unknown, leave blank.

Date: Enter the date on which the form is completed (mm/dd/yyyy).

Completed By: Enter the name and firm of person completing the form.

DNR Point ID Number: Enter the 3-digit number assigned to the point by the Department, for use by the Department.

Point Name: Enter the common name given to the point by the facility or consultant; e.g. MW-2, GP-5. If the point had a previous name, please include and identify as such.

Wisconsin Unique Well Number (WUWN): Enter the Wisconsin Unique Well Number assigned to groundwater monitoring and private wells. WUWNs are available from the Department and are to be assigned to all newly installed monitoring and private wells.

Type: Enter the Numerical code describing the type of well or sampling point. Point type codes range from 11 to 99. *See list of Point Types beginning on page 4.*

Status: Enter the status of the well using the following codes:

A	–	**A**ctively monitored point
I	–	**I**nactive point (existing point not currently being monitored)
P	–	**P**ermanently abandoned point
L	-	P**L**anned.

INSTRUCTIONS FOR COMPLETING THE GROUNDWATER MONITORING WELL AND POINT INFORMATION FORM (#4400-089)

Gradient Position: Enter the location of the well in the groundwater flow system relative to the disposal site, spill, etc. *Use one of the six letters designated below. If gradient position is not known or does not apply to the type of point, leave blank.*

U = Up gradient	D = Down gradient	Y = Side-to-down gradient
S = Side gradient	X = Side-to-up gradient	N = Not known

Enf. Stds. Apply: Enter "Y" if enforcement standards apply at this well. Enforcement standards apply to any well beyond the **D**esign **M**anagement **Z**one (DMZ) or the property boundary of the facility or to a water supply well. For spills, enforcement standards apply at every point at which groundwater is monitored. (For more information, see s. NR 140.22, Wis. Adm. Code.) *If the application of enforcement standards is not relevant to the type of point entered, leave blank.*

Construction Date: Enter the installation date of the point.

Elevations:

Ground Surface: The elevation, in feet, of the ground surface adjacent to the well using mean sea level (MSL) based on national geodetic vertical survey (i.e., NAVD88).

Well Top (of casing): The elevation, of the top of the well casing (not top of protective pipe), in feet using MSL based on national geodetic vertical survey (i.e., NAVD88).

Well Casing:

Type: The type of pipe used: plastic (P), steel (S), or other (O).

Diam: The inside diameter of the pipe used in the well construction, in inches.

Length: The length of the well casing from the top of the casing to the top of the screen, measured in feet.

Well Screen Length: The length of the screen measured in feet.

Well (Point) Total Length: The total length of the well (or point) from the top of the casing to the bottom of the well, measured in feet. *Should equal sum of well casing length and screen length.*

Point Coordinate Reference Systems: Only one coordinate reference system may be used on the form. Allowable coordinate systems are Lat/Long (in decimal degrees [DD] only), State Plane and Wisconsin Transverse Mercator (WTM91). County coordinate systems (WISCRS) may also be used. Local grid coordinates are *not* accepted. The field named "Y / Lat / Northing" describe the vertical axis and the field "X / Long / Easting" describe the horizontal axis.

INSTRUCTIONS FOR COMPLETING THE GROUNDWATER MONITORING WELL AND POINT INFORMATION FORM (#4400-089)

Identify the coordinate reference system used:

- Latitude/Longitude WGS84 (Decimal Degrees, minimum 8 digits total w/ 6 right of decimal)
- State Plane (min. 2 digits right of decimal):
  - North
  - Central
  - South
- Wisc. Transverse Mercator (WTM91, min. 2 digits right of decimal)
- Local County Coordinate System (aka Wisconsin Coordinate Reference System (WISCRS), minimum digits vary by county)

Identify the projection datum used (listed below) by checking the appropriate box on the bottom of the form. NOTE: A datum is not required for Lat/Long.

- NAD83
- NAD27
- NAD83(91)
- NAD83(11)
- Other

Identify the units used, meters or feet, for State Plane, WTM or Local County Coordinate System.

Identify the method used to determine the coordinates by checking the appropriate box on the bottom of the form. The options are:

- GPS001-Survey grade GPS
- GPS003-Mapping grade GPS with real-time differential correction
- GPS004-Mapping grade GPS with post processing differential correction
- SRV001-Classical terrestrial surveying techniques
- OTH001 (Other)

Remarks: Include any comments applicable to the submittal (e.g., Re-surveyed top of well casing elevation).

List of Point Types

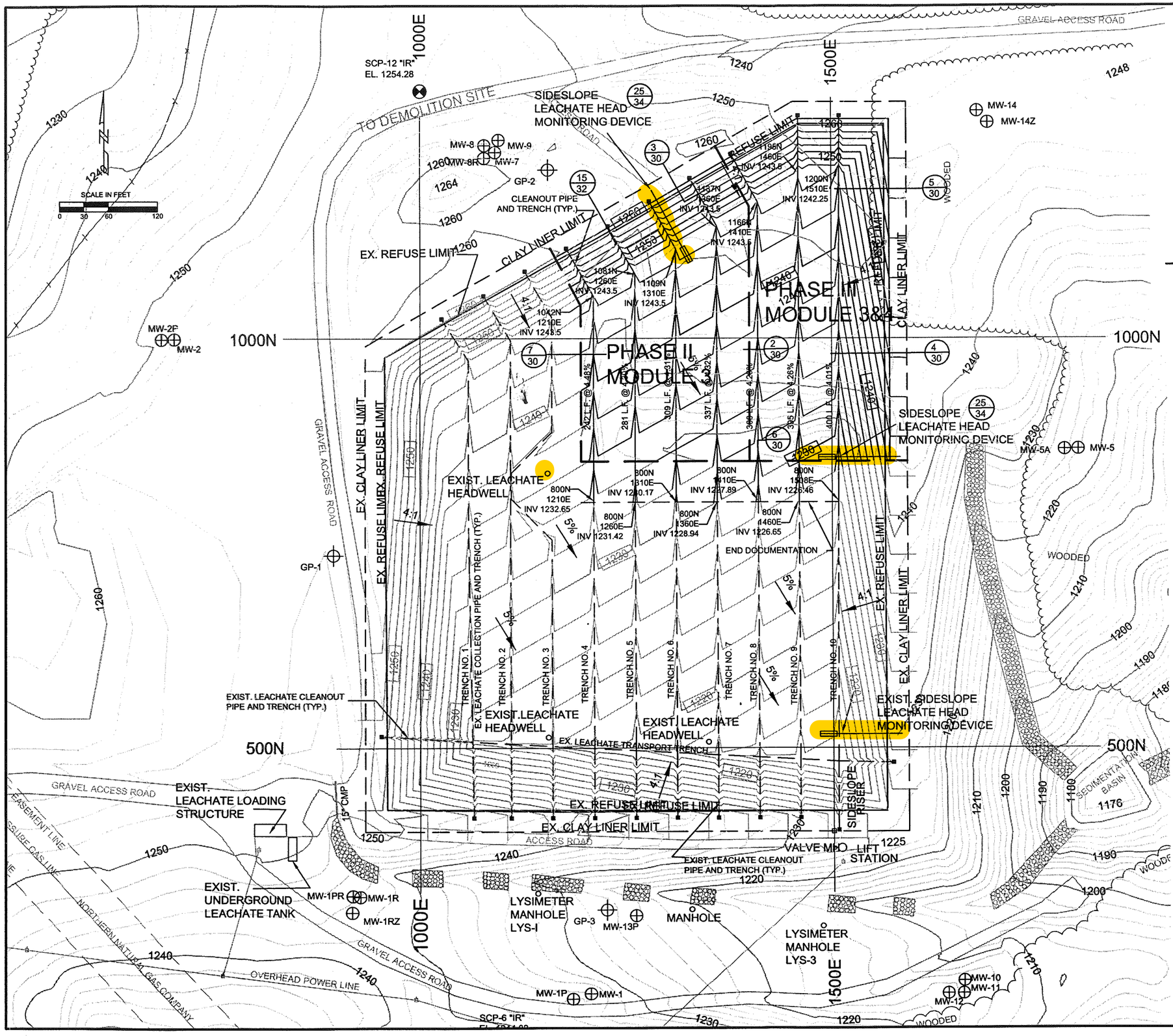
11 (mw) Water table observation well (monitoring well screen intersecting the water table) (non-Subtitle D well)
12 (pz) Piezometer (monitoring well with screen sealed below the water table (non-Subtitle D well)
13 (pw) Private well - potable water supply
14 (ly) Lysimeter
15 (sp) Spring
16 (rp) Resistivity probe
17 (gc) Gradient control
18 (at) Aquifer test well
19 (pn) Private well-non potable
21 (fs) Flow or seep
22 (sw) Surface water
23 (lc) Leachate collection system
24 (lh) Leachate head well
25 (lg) Leachate and gas combo
26 (ew) Groundwater extraction well
27 (he) Horizontal groundwater extraction well

28 (hw) Horizontal monitoring well
29 (ha) Horizontal vapor extraction well
31 (us) Upstream
32 (ms) Mid-site
33 (ds) Downstream
34 (ro) Run-off
35 (im) Impounded
36 (sg) Staff gauge
41 (tr) Treated
42 (pr) Pretreated
45 (pp) Private well primary treatment
46 (ps) Private well secondary treatment
49 (sh) Settlement hub
51 (gp) Gas probe
52 (nl) Non-landfill structure
53 (ge) Gas extraction system
54 (gu) Gas utilization or destruction
55 (gc) Gas condensate
56 (sc) Site conditions collection
57 (sv) Soil venting well (includes both soil vapor extraction and bioventing, includes both extraction and unsaturated zone gas phase injection wells installed in soil or fill, but not refuse)
58 (gm) Gas sample monitoring point
59 (sc) Stone column gas extraction well
61 (ij) Injection well (injection of liquids not gases)
62 (as) In situ air sparging well (injection well to inject gases into the aquifer
63 (uv) Unterdruck Verdampfer Brunnen (UVB) wells (sparging wells where the gases remain in the well and are not injected into the aquifer)
64 (le) Groundwater and light non-aqueous phase liquid (LNAPL) extraction well
65 (de) Groundwater and dense non-aqueous phase liquid (DNAPL) extraction well
66 (ve) Vacuum enhanced groundwater extraction wells
67 (vi) Vacuum enhanced groundwater and LNAPL extraction well
68 (vd) Vacuum enhanced groundwater and DNAPL extraction well
71 (dw) Subtitle D water table observation well (see 11/mw)
72 (dp) Subtitle D piezometer (see 12/pz)
80 (mc) Municipal water supply well: cities, villages, and sanitary districts
81 (oc) Community-other-than-municipal (OTM) water supply well: mobile home parks, apartments, subdivisions, and condominium complexes
85 (nn) Noncommunity-Nontransient water supply well (schools, day care centers, and industries) A Noncommunity water system that regularly serves at least 25 of the same persons over 6 months per year
86 (tn) Noncommunity-Transient water supply well (motels, restaurants, parks, taverns, churches, and campgrounds) A Noncommunity water system that serves at least 25 people at least 60 days of the year
99 (ot) Other

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Appendix B

Leachate Figures



LEGEND

- EXISTING EDGE OF WOODS
- EXISTING POWER POLE
- EXISTING RIPRAP
- SCP - 6 — EXISTING SURVEY CONTROL POINT
- GW- 1 — EXISTING GAS PROBE
- MW - 1 — EXISTING MONITORING WELL
- EXISTING FENCE
- 1230 — EXISTING CONTOURS INDEX (9/29/04)
- EXISTING CONTOURS INTERMEDIATE (9/29/04)
- 1220 — EXISTING SUB-BASE CONTOURS INDEX
- EXISTING SUB-BASE CONTOURS INTERMEDIATE
- 1220 — BASE CONTOURS INDEX
- BASE CONTOURS INTERMEDIATE
- PHASE LIMIT LINE AND CLAY LIMIT LINE

DETAIL REFERENCE NOTE

16/32 SEE DETAIL 16 ON PAGE 32

NOTE:
THIS BASE GRADE SHEET ILLUSTRATES:

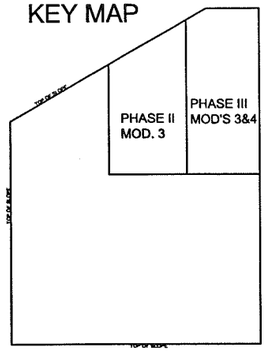
THE EXISTING BASE GRADES AND SLOPE PERCENTS AND SIDESLOPE SLOPE RATIOS CONSTRUCTED IN PRIOR MODULE DOCUMENTATION REPORTS.

THE INSTALLED LEACHATE COLLECTION SYSTEM CONSTRUCTED IN PRIOR MODULE DOCUMENTATION REPORTS.

THE EXISTING WASTE LIMIT AND CLAY LIMIT ESTABLISHED IN PRIOR MODULE DOCUMENTATION REPORTS.

THE REMAINING PHASES II & III CLAY LINER AREAS AND THEIR PERCENT SLOPE AND SIDESLOPE SLOPE RATIOS AND LEACHATE COLLECTION SYSTEM TO BE CONSTRUCTED IN THE NEW PLAN OF OPERATION.

KEY MAP



BASE GRADES

CWEA
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5707 SCHOFIELD AVENUE
WESTON, WISCONSIN
54476
PHONE: (715) 359-9400
FAX: (715) 355-4199
general@cwengineers.com
http://www.cwengineers.com

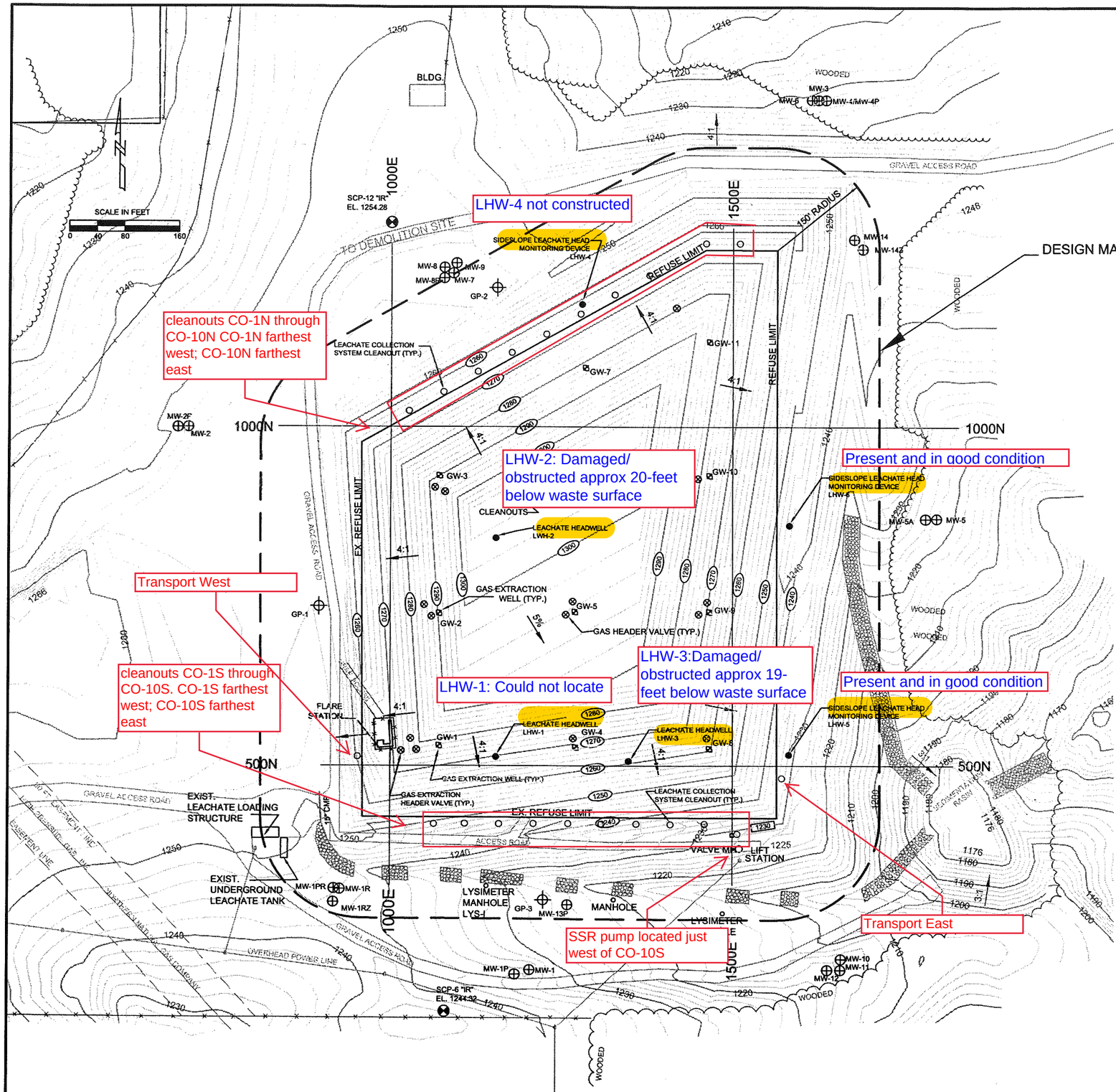
PROJECT:
BASE GRADES AND LEACHATE COLLECTION SYSTEM
VERNON COUNTY SANITARY BALEFILL
PLAN OF OPERATION FOR VERTICAL EXPANSION

REVISIONS:

PROJECT NO: 94602000
DRAWN BY: D.H.
CHECKED BY: P.A.
APPROVED BY: H.Z.
DATE: JAN 2005

SHEET: 6 OF 31

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LEGEND

- EXISTING EDGE OF WOODS
- EXISTING POWER POLE
- EXISTING RIPRAP
- SCP - 6 — EXISTING SURVEY CONTROL POINT
- GW- 1 — EXISTING GAS PROBE
- MW - 1 — EXISTING MONITORING WELL
- EXISTING FENCE
- 1230 — EXISTING CONTOURS INDEX
- EXISTING CONTOURS INTERMEDIATE
- 1220 — FINAL CONTOURS INDEX
- FINAL CONTOURS INTERMEDIATE
- GW-1 — GAS EXTRACTION WELL

MONITORING DEVICES AND MONITORING FREQUENCY

Monitoring Device	Monitoring Frequency
Groundwater Monitoring Wells:	Semi-Annually
Water-Supply Wells	Semi-Annually
Gas Extraction Blower Station	Twice-monthly
Gas Extraction Wells	Monthly
Gas Probes	Semi-Annually
Gas System Condensate	Annually
Leachate Volume	Monthly
Leachate Chemistry	Semi-Annually
Leachate Head Well Volumes	Monthly
Leachate Line Cleaning	Annually
Lysimeters	Semi-Annually
Sedimentation Basin Chemistry	Semi-Annually
Sedimentation Basin Dredging	As Needed
Cover Vegetation Mowing	Annually
Inspections:	
Cover Vegetation	Semi-Annually
Runoff Control Structures	Semi-Annually
Cap Settlement	Semi-Annually
Roads	Semi-Annually
Leachate Collections System	Semi-Annually
Lysimeters	Semi-Annually
Gas Extraction System	Monthly

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general@cwengineers.com
http://www.cwengineers.com

PROJECT:

FINAL CLOSURE & MONITORING PLAN
VERNON COUNTY SANITARY BALEFILL
PLAN OF OPERATION FOR VERTICAL EXPANSION

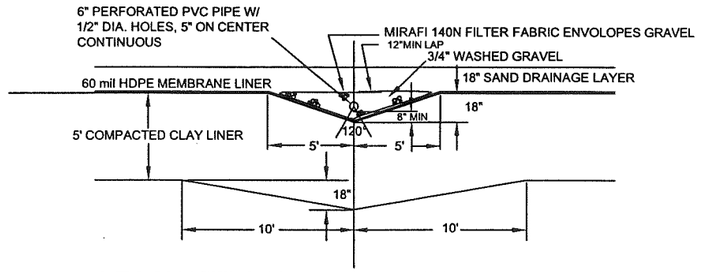
REVISIONS:

PROJECT NO: 94602000
DRAWN BY: D.H.
CHECKED BY: P.A.
APPROVED BY: H.Z.
DATE: JAN 2005

SHEET: 16 OF 31

XREF: PHASE FINAL
LAYER MANAGER CLOSURE MONITOR

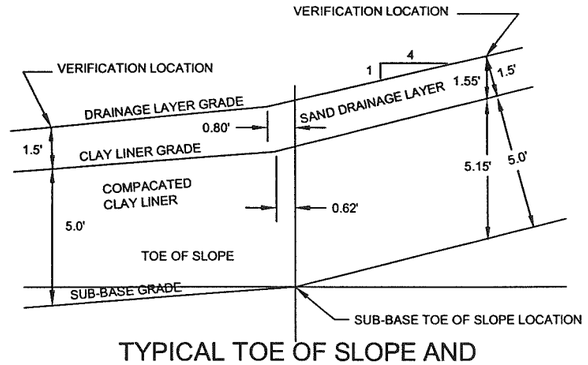
J:\DRAFT\VERNON\PLAN OF OPERATION\TOTAL SITE.dwg, FINAL CLOSURE MONITOR, 2/2/2005 3:21:00 PM



LEACHATE COLLECTION LINE TRENCH AND PERFORATATED PIPE

2

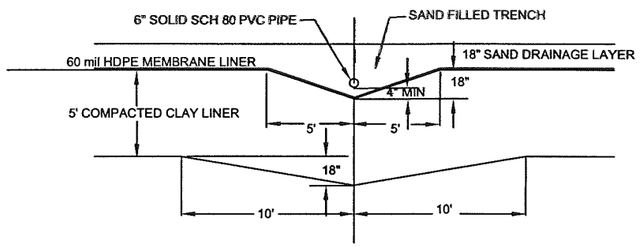
NOT TO SCALE



TYPICAL TOE OF SLOPE AND THICKNESS VERIFICATION

5

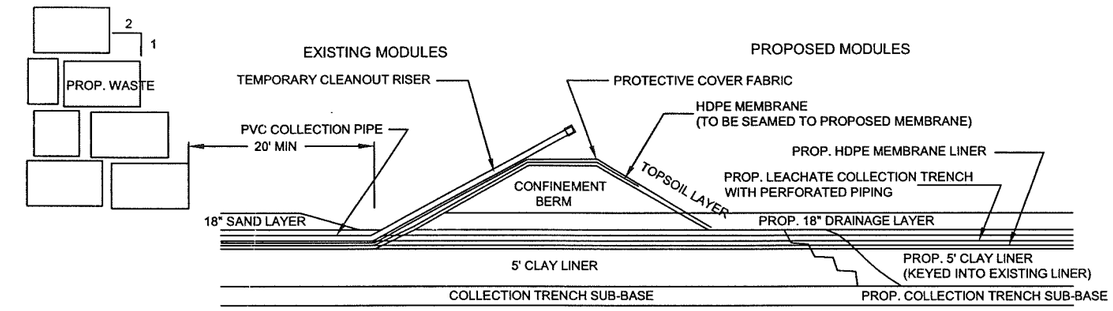
NOT TO SCALE



CLEANOUT LINE TRENCH

3

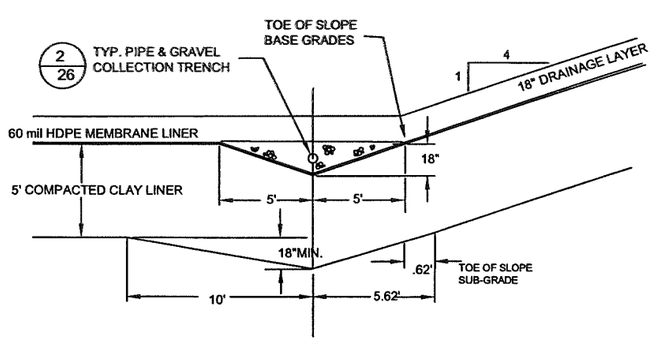
NOT TO SCALE



LEACHATE CONFINEMENT BERM BETWEEN MODULES

6

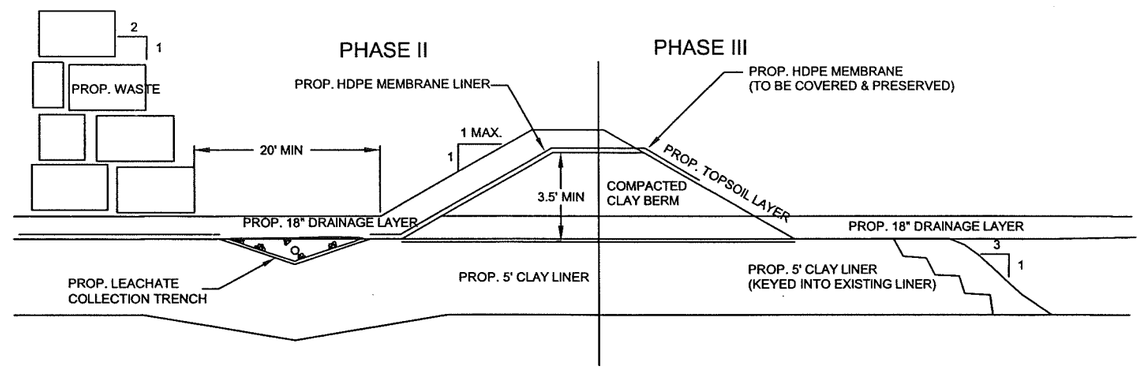
NOT TO SCALE



LEACHATE COLLECTION LINE TRENCH ALONG SIDESLOPE

4

NOT TO SCALE



LEACHATE CONFINEMENT BERM BETWEEN PHASES

7

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general@cwengineers.com
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PROJECT:

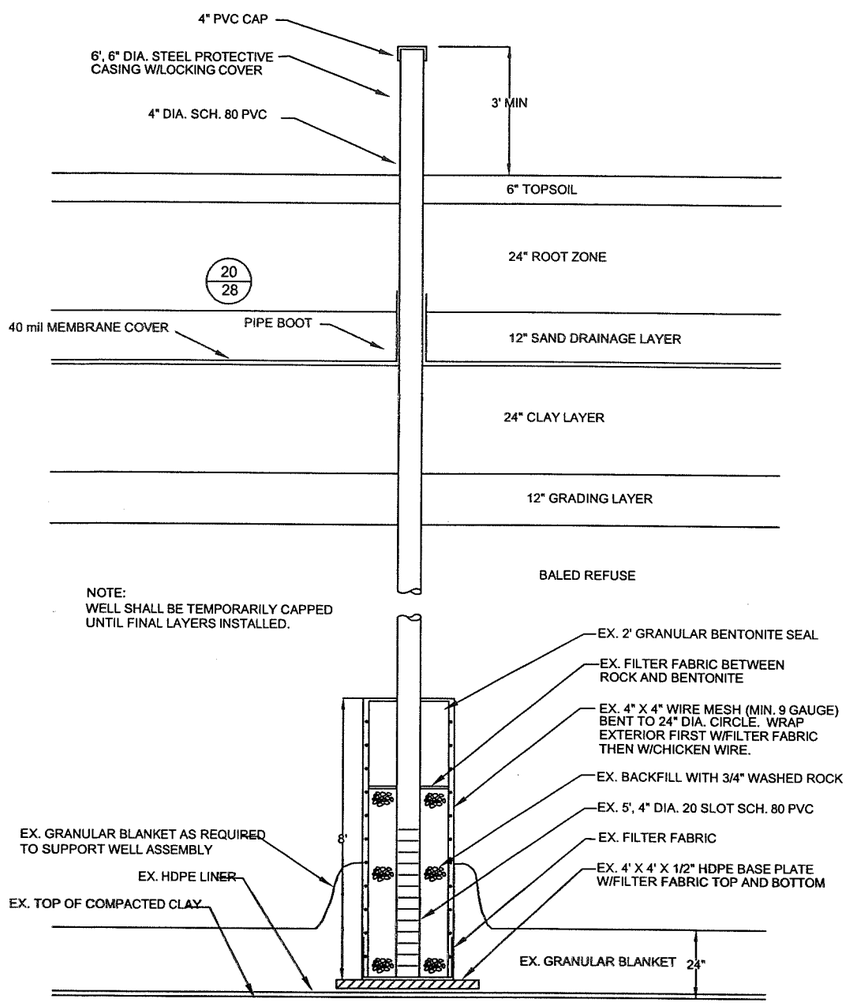
DETAILS
VERNON COUNTY SANITARY BALEFILL
PLAN OF OPERATION FOR VERTICAL EXPANSION

REVISIONS:

PROJECT NO: 94602000
DRAWN BY: D.H.
CHECKED BY: P.A.
APPROVED BY: H.Z.
DATE: JAN 2005

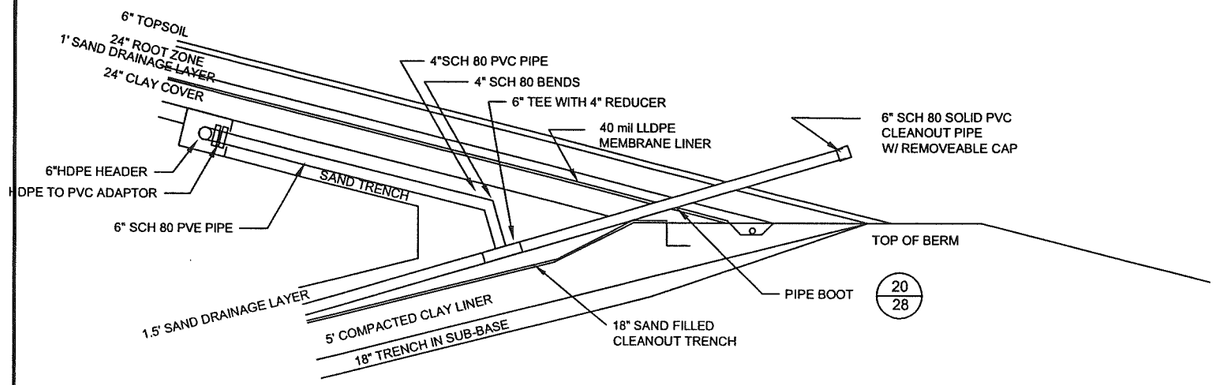
SHEET: 25 OF 31

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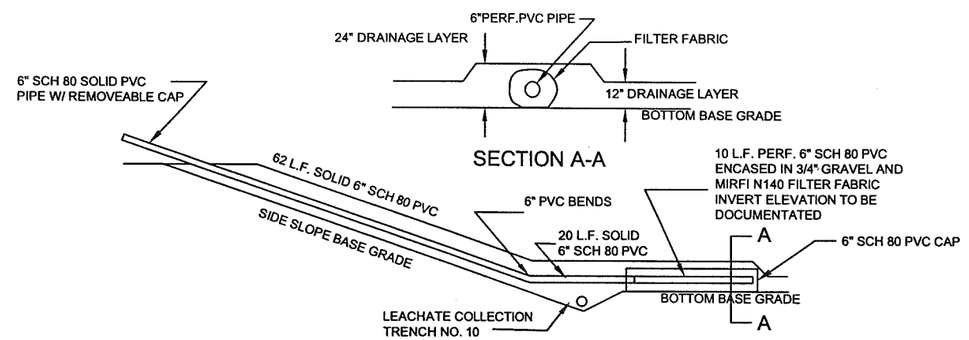
23 LEACHATE HEADWELL

NOT TO SCALE



24 CONDENSATE PIPE TO CLEANOUT TIE-IN

NOT TO SCALE



25 SIDESLOPE LEACHATE HEAD MONITORING DEVICE

NOT TO SCALE

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CENTRAL WISCONSIN ENGINEERS & ARCHITECTS

5707 SCHOFIELD AVENUE
WESTON, WISCONSIN
54476

PHONE: (715) 359-9400
FAX: (715) 355-4199

general@cwengineers.com
http://www.cwengineers.com

PROJECT:

DETAILS

VERNON COUNTY SANITARY BALEFILL
PLAN OF OPERATION FOR VERTICAL EXPANSION

REVISIONS:

PROJECT NO: 94602000

DRAWN BY: D.H.

CHECKED BY: P.A.

APPROVED BY: H.Z.

DATE: JAN 2005

SHEET: 29 OF 31

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Appendix S

Leachate Discharge Permit and Quality Report Summaries

S-1 – La Crosse County Landfill Industrial Wastewater Discharge Permit
S-2 – City of Viroqua Industrial Wastewater Discharge Permit
S-3 – Leachate Analytical Data Summary (2018-2022)

S-1 – La Crosse County Landfill Industrial Wastewater Discharge Permit

CONTRACT APPROVAL FORM

CONTRACT TITLE:	Delivery and Acceptance of Leachate Generated		
FULL VENDOR /PROVIDER NAME:	Vernon County Solid Waste Department		
VENDOR ACRONYM: (if applicable)			
COUNTY DEPARTMENT:	La Crosse County Solid Waste Department		
CONTRACT START DATE:	4/15/16	**CONTRACT END DATE:**	4/15/19
CONTRACT TYPE:	☒ ORIGINAL CONTRACT		
	☐ AMENDMENT/EXTENSION	DATE OF ORIGINAL	*(MM/DD/YYYY)*

THE ATTACHED CONTRACT REQUIRES:

		Approved By:	Date
☒	Department Head Approval	Henry A. Koch, P.E.	5/16/2016
☐	Committee Approval		
☐	County Board Approval		
☐	Finance Director		
☒	Board Chair Signature	Tara Johnson	
☐	County Administrator		

DEPARTMENT COMMENTS: ____

FINANCIAL INFORMATION:				CORPORATION COUNSEL REVIEW:	
ORG#	____	____	____	Date:	
ACCT#	____	____	____	☐	Approved as to form/content
CURRENT REVISED BUDGET				☐	Hold for County Board Approval
	____	____	____	☐	Not Acceptable
CONTRACT AMOUNT	____	____	____		
				Signature of Reviewing Attorney	
SOURCE OF FUNDING		____	____		

CORPORATION COUNSEL COMMENTS:

REV. 12/23/09

Memorandum of Understanding

between

La Crosse County Solid Waste Department (La Crosse County)

and

Vernon County Solid Waste Department (Vernon County)

I. Purpose and Scope

The purpose of this Memorandum of Understanding (MOU) is to clearly identify the roles and responsibilities of each party as they relate to the delivery and acceptance of leachate generated from Vernon County for recirculation at La Crosse County.

As part of La Crosse County's Organic Stability Plan, leachate is recirculated in specified areas of the active landfill filling operation to increase moisture content of waste in efforts to expedite decomposition of the organic fraction. The cost to re-circulate leachate generated at La Crosse County is much higher than the cost to direct discharge the leachate to the City of La Crosse's waste water treatment system (WWTS) due to handling of the liquid. Therefore, it is prudent for La Crosse County to identify more effective cost options to achieve the requirements of the Organic Stability Plan.

Vernon County experiences considerable costs to manage leachate generated at their facility. Vernon County is located in a rural area and does not have a direct connection to a WWTS. Therefore, leachate generation must be collected and transported to a WWTS that is capable of accepting and treating the volume and contaminant concentrations typical of leachate generated at Vernon County. Due to elevated levels of ammonia-nitrogen, many of the local WWTS charge an increased price to treat the leachate from Vernon County. In addition, the local WWTS often are not capable of receiving leachate from Vernon County during select times of year due to precipitation/run-off and capacity issues, or during times of system maintenance. This creates operational issues for Vernon County. It is necessary for Vernon County to identify additional cost effective leachate management options to provide stability for their system.

In accordance with regulatory requirements, La Crosse County has been granted approval from the Wisconsin Department of Natural Resource's to utilize leachate generated at Vernon County for recirculation at La Crosse County. Approval has been granted via a Research, Development and Demonstration (RD&D) Plan approval dated April 15, 2016. The RD&D approval is effective for three years, and La Crosse County may apply for up to three, 3-year renewal periods.

La Crosse County and Vernon County endeavor to work collaboratively to manage leachate generated at Vernon County and recirculated at La Crosse County to the benefit of each system. The framework for this MOU is based on:

- A mutual understanding of the importance of each facility to the region and each other
- A mutual understanding of the importance of relationships and precedent of collaborative agreement
- The importance of fiscal accountability to each systems stakeholders
- The importance of environmental stewardship

II. MOU Term

The term of this MOU Agreement is the period within which the project responsibilities of this agreement shall be performed. The term commences on the date the WDNR issues approval of the RD&D Plan (April 15, 2016) and terminates the day the RD&D Plan approval expires (April 15, 2019). This MOU automatically renews should additional renewals be approved by the WDNR, unless La Crosse County and Vernon County mutually agree to terminate this Agreement in accordance with Section VII below.

III. La Crosse County Responsibilities

The La Crosse County Solid Waste Department shall undertake the following activities during the duration of the MOU term:

1. Provide advance direction and visual representation of the area to be utilized for leachate recirculation.
2. Provide reasonable access to Vernon County, or their contract hauler for ingress and egress
3. Provide access to the recirculation area during normal landfill business hours.
4. Assist, or provide assistance as necessary to efficiently off load leachate in areas specified.
5. Limit access to the recirculation area by the public during leachate recirculation operations.
6. Invoice Vernon County for disposal on a quarterly basis, or as otherwise agreed upon.
7. Review site conditions with respect to Organic Stability Plan and RD&D Plan to inspect and document compliance with warning and threshold alert symptoms.
8. Provide notice to Vernon County within 24-hours of any period in which leachate cannot be accepted at La Crosse County.
9. Review and approve all documentation evidencing Vernon County's performance of services as set forth in the Scope of Work and monitor their compliance with the MOU.

IV. Vernon County Responsibilities

The Vernon County Solid Waste Department shall undertake the following activities during the duration of the MOU term:

1. Provide 24-hour advanced notice of any load being transported to La Crosse County.
2. Notify La Crosse County of any change of operation, or waste acceptance practice that may affect "typical" leachate quality.
3. Provide laboratory analytical data for all leachate samples collected as part of permits and approvals, or as voluntary collected.
4. Deliver up to 26,400 gallons per week of leachate for leachate recirculation to La Crosse County. This is understood by both parties to be a goal, and not a requirement. Instances

may occur with both parties that may result in increasing, limiting or suspending leachate recirculation indefinitely due to precipitation, costs, convenience, or compliance with the RD&D Plan.

5. Conduct operations during normal landfill business hours. Afterhour's access and operations may be allowed on an "emergency" basis.

6. Conduct, or subcontract all leachate collection, transportation and disposal in compliance with all Local, State, and Federal Regulations and Permits.

7. Maintain and submit to La Crosse County records of volume of leachate transported to La Crosse County for the basis of invoicing

8. Compensate La Crosse County $0.005 for each gallon of leachate delivered and recirculated. The payment shall be quarterly, or as applicable.

9. Review and approve all documentation evidencing La Crosse County's performance of services as set forth in the Scope of Work and monitor their compliance with the MOU.

VII. Modification and Termination

1. This Agreement may be cancelled or terminated without cause by either party by giving 90 calendar days advance written notice to the other party. Such notification shall state the effective date of termination or cancellation and include any final performance and/or payment invoicing instructions/requirements.

2. Any and all amendments must be made in writing and must be agreed to and executed by the parties before becoming effective.

VIII. Effective Date and Signature

This MOU shall be effective upon the signature of appropriate La Crosse County and Vernon County authorized officials. It shall be in force from the term specified in Section II. La Crosse County and Vernon County indicate agreement with this MOU by their signatures.

Signatures and dates

	Steve Eastwood
[*Authorized signature from La Crosse County*]	[*Authorized signature from Vernon County*]
	Solid Waste Administrator
Title	Title
	May 12, 2016
Date	Date

S-2 – City of Viroqua Industrial Wastewater Discharge Permit

LEACHATE AGREEMENT
BETWEEN THE COUNTY OF VERNON AND THE CITY OF VIROQUA

This agreement is made by and between the County of Vernon, a body corporate, hereafter referred to as "County", and the City of Viroqua, a municipal corporation, hereafter referred to as "City".

WHEREAS, the County owns and proposes to operate a solid waste disposal facility located in Vernon County; and

WHEREAS, the City owns and operates a waste water treatment facility located in the City of Viroqua; and

WHEREAS, the County as part of the operation of the solid waste disposal facility will accumulate liquid waste at said facility, which liquid waste is hereafter referred to as "leachate"; and

WHEREAS, the parties hereto intend to contract for the treatment of said leachate at the City's waste water treatment facility, pursuant to the authority granted by section 66.30, Wisconsin Statutes;

NOW, THEREFOR, in consideration of the mutual covenants and obligations set forth herein, the County and the City mutually agree as follows.

1. Nature of Agreement: The City in this agreement and its obligations herein is acting in its proprietary capacity and is

not acting in its governmental capacity as a public utility with respect to the County or any of the citizens of the County for purposes of this agreement. No part of this agreement shall be construed as an undertaking or obligation of the City to extend the treatment of leachate or sewage to any territory or person other than those areas and persons now served, except the undertaking and obligation to accept leachate from the County strictly in accordance with the terms hereof.

2. Operation of the Leachate System: It is anticipated that the normal execution of this agreement shall be that the County will collect leachate at its solid waste disposal facility and transport the same at the County's cost, expense, and liability to the City's waste water treatment plant and discharge the same into a leachate holding tank or receptacle to be constructed at said sewage plant.

3. Operating Hours and Conditions: The City will allow the County access to the tank or receptacle during supervised hours of the City's waste water treatment plant, and at such other times as the parties may agree in writing.

4. Design, ownership of System, and Capital cost recovery: The City shall design and construct facilities at the City's waste water treatment plant to the extent necessary to accept leachate. The City shall be the owner of such system. The City

may charge the cost thereof to the County to be repaid over a period of years with an interest factor thereon to the extent, and at the same average rate, as the cost to the City for any debt incurred for the design and construction of said leachate facilities. It is understood and agreed that to the extent that the City is also one of the users of the County solid waste disposal facility, as is now intended by the City, and to the extent that the County's uniform charges to municipalities (including the City) for use of the solid waste disposal facility is based, in whole or in part, upon the total cost to the County of the County's solid waste disposal facility, that the City in effect will also be thus paying the City's proportionate part of the capital cost (as well as any operational expense charge as hereinafter provided) of the leachate facilities based upon the City's use of the County's solid waste disposal facility in proportion to such use by other municipalities. The design of the facilities shall be sufficient to accomodate leachate treatment capacity on the following basis (subject to restrictions upon use of such capacity as hereinafter provided):

	Quantity:	BOD load:
Phase I:	1,400 GPD	117 lbs/day
Phase II:	3,100 GPD	258 lbs/day

(Leachate BOD = 10,000 mg/L)

The capacity of the leachate receiving facilities will be 20,000 gallons. Hauling shall be scheduled so this capacity is not exceeded.

5. Use of the Leachate Facilities by others. The City shall have the right to utilize the leachate facilities for other users, but only on conditions that (a) such other users do not interfere with the County's primary right to use of the leachate facilities, and (b) the County shall be relieved of the cost of the leachate facilities in proportion to the use thereof by other users.

6. Repairs and Maintenance of the Leachate Facilities: The City shall be responsible for performing maintenance and repairs of the leachate facilities.

7. Testing: The City shall be responsible for controlling the rate of leachate discharged and for measuring the volumes and strength of leachate discharged into the waste water treatment plant and maintaining records of tests and results, which shall be available to the County at all times. Leachate sampling for strength shall be made as leachate is transferred to the treatment facilities, as the City determines necessary and convenient. Said tests shall be performed in accordance with standard laboratory procedures. The County may also have said leachate sampled.

8. Operating, maintenance and replacement expenses: The expenses for operation, maintenance and replacement of the leachate facilities, testing the leachate, and treatment of the leachate, shall be paid by the County. Expenses for treatment of the leachate will be based on the leachate flow BOD and suspended solids concentration and current user charge system. The City may bill the County quarterly for such expenses, unless the parties hereto agree to a fixed charge per gallon (or on any other method). Any such charge by the City shall conform to any applicable administrative rule or regulation, including any rule, regulation, or tariff within the jurisdiction of the Department of Natural Resources and/or Public Service Commission.

9. Acceptable Leachate: Leachate to be accepted by the City must not have any characteristic, or be of such volume or strength, that would cause, or threaten to cause, the City to be in violation of the City's Wisconsin Pollution Discharge Elimination System (WPDES) permit, or upset the treatment process. At such time as the leachate production reaches Phase II levels, the County will then utilize other acceptable disposal facilities, in order that the loading at the City's waste water treatment plant remains at or below Phase II levels.

10. Term of this Agreement: This agreement shall remain in

effect for the period of time that the County is required to dispose of leachate from the County's solid waste disposal facility, or for such longer period of time as may be required for the County to pay the City for the capital cost of the leachate facilites at the City's waste water treatment plant. This agreement may be terminated at any time by mutual consent of the parties hereto, in writing. This agreement may also be terminated by either party if there is a default by the other party in any term or condition to be performed by the other party which is not corrected within 60 days of written notice of default, unless within such period the defaulting party takes reasonable steps to correct such default and it is reasonable to expect that the defaulting party will be able to correct such default within a reasonable time. Any cost or expense to a party caused by the other party's default shall be paid by the defaulting party.

11. Indemnity: The City agrees to indemnify and hold the County harmless from any and all loss, cost, and liability caused by the City's breach of this agreement and because of any negligence of the City. The County agrees to indemnify and hold the City harmless from any and all loss, cost, and liability caused by the County's breach of this agreement and because of any negligence of the County.

12. Whole agreement: This instrument contains the whole agreement of the parties hereto with respect to acceptance of leachate at the City's waste water treatment plant and the payment for the capital and operational cost to the City because of said leachate facilities and the City's share of the County charges for the City's use of the County's solid waste disposal facility which is based upon leachate disposal.

IN WITNESS WHEREOF the parties have executed this Agreement, the County by authority of its Board of Supervisors, the City by authority of its Common Council.

VERNON COUNTY:

By: _____ (Seal)
Chairman, Board of Supervisors

By: _____ (Seal)
County Clerk

CITY OF VIROQUA:

By: _____ (Seal)
Mayor

By: _____ (Seal)
City Clerk

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S-3 – Leachate Analytical Data Summary (2018-2022)

Appendix R-2
Leachate Anaytical Data Summary
Vernon County Landfill

Parameters [1]	Units	03/15/2018	09/12/2018	03/13/2019	09/11/2019	03/11/2020	09/16/2020	03/17/2021	09/15/2021	03/16/2022	09/14/2022
TEMPERATURE, WATER (DEGREES CENTIGRADE)	C	16.73	19.95	8.96	21.38	12.02	16.8	10.11	19.85	11.95	15.89
SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	umho/cm	14700	12150	9610	1211	11430	10360	10970	12910	13620	11990
SOLIDS, TOTAL SUSPENDED (MG/L)	mg/L	11	110	44	18	28	13	8.4	8.2	19	4
BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C)	mg/L	110	440	74	73	65	79	120	96	85	92
CHEMICAL OXYGEN DEMAND, UNFILTERED (MG/L)	mg/L	2000	2200	1100	1600	770	1200	1500	1500	1700	1600
PH, FIELD (STANDARD UNITS)	SU	7.25	6.52	8.09	7.92	7.45	8.42	7.81	7.72	7.47	7.41
ALKALINITY, TOTAL (MG/L AS CACO3)	mg/L	5900	5200	3600	4400	4200	4100	4000	4800	5400	4300
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	970	700	600	225	120	640	720	880	820	850
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	760	540	610	720	720	700	790	890	970	920
HARDNESS, TOTAL (MG/L AS CACO3)	mg/L	768	356	621	877	479	733	639	612	859	669
SODIUM, TOTAL (MG/L NA)	mg/L	1420	496	996	1210	650	764	935	958	1515	863
CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)	mg/L	1900	1800	1000	1400	1300	1100	1100	1600	2300	1200
SULFATE, TOTAL (MG/L SO4)	mg/L	2.4 J	34	3.4	12	2.3 J	20	23	12	2 J	28
CADMIUM, TOTAL (UG/L CD)	ug/L	0.78 J	<0.3	<0.3	<0.3	<0.3	<0.3	<0.4	<0.42	<2.1	<0.42
LEAD, TOTAL (UG/L PB)	ug/L	<2.8	<1.4	<1.4	5.3	<1.4	5.3	<1.4	1.5 J	<7	3.5 J
MANGANESE, TOTAL (UG/L MN)	ug/L	1820	845	1320	1840	1030	1770	1610	1430	1820	1420
TOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	<3	<3	<3	3.7 J	<2.1	2.6 J	<2.1	<2.7	<2.7	<2.7
BENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	3.7 J	5.7 J	3.1 J	4.7 J	4.3 J	<4	4.9 J	<4.7	4.7 J	<4.7
CHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	5.1 J	<5	<5	7.2 J	4.8 J	3.2 J	<3	<3.7	<3.7	<3.7
DIETHYL PHTHALATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NA	2.5 J	NA	3.2 J	NA	<0.3	NA	<0.3	NA	<0.28
BROMOMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	<7	<7	<7	<9	9.2 J	<9	<9	<7.2	<7.2	<7.2
DICHLOROMETHANE IN WHL WTR SAMPLE (UG/L)	ug/L	11 J	<5	6.8 J	<4	26	<4	<4	<12	<12	<12
M-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NA	<5	NA	<2.6	NA	<2.6	NA	4.5 J	NA	<0.23
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	<6	8.6 J	<6	7.8 J	7.8 J	9.2 J	8.5 J	5.6 J	7.4 J	6.2 J
P-DICHLOROBENZENE IN WHL WTR SAMPLE (UG/L)	ug/L	NA	2.9 J	NA	4.1 J	NA	3.6	NA	3.4 J	NA	2.7
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NA	7.2 J	NA	5.8 J	NA	5.7 J	NA	6.9 J	NA	4.4 J
NAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	<7	2.8 J	<7	4.4 J	6.9 J	2.7	5.4 J	4.4 J	7.1 J	2.6
BIS(2-ETHYLHEXYL) PHTHALATE (DEHP)WHL WTR SMP(UG/L	ug/L	NA	<1.8	NA	<1.7	NA	0.79 J	NA	<2.7	NA	1.1 J
DI-N-BUTYL PHTHALATE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NA	<1.7	NA	<1.7	NA	<0.36	NA	<3.6	NA	0.81 J
VINYL CHLORIDE IN WHOLE WATER SAMPLE (UG/L)	ug/L	<1.9	2.6 J	<1.9	<1.4	<1.4	<1.4	<1.4	<1.5	<3.3	<1.5
CRESOLS IN WHOLE WATER SAMPLE (UG/L)	ug/L	NA	73	NA	<2.2	NA	<3.5	NA	<35	NA	<3.3
MERCURY, TOTAL (UG/L HG)	ug/L	<0.02	0.38	0.077	0.039 J	<0.1	<0.02	0.034 J	<0.1	<4.1	0.032 J
IRON, TOTAL (MG/L FE)	mg/L	<0.07	5.08	6.96	9.75	6.67	10.2	0	10	13	11.4
XYLENE, O-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	6.9 J	13 J	6 J	11	10	10	11	8.6 J	9.4 J	7.8 J
O-CRESOL (2-METHYLPHENOL) IN WHL WTR SAMPLE (UG/L)	ug/L	NA	3.7 J	NA	<1.9	NA	<1.5	NA	<15	NA	<1.4
1,2,4-TRIMETHYLBENZENE IN WHOLE WATER SAMPLE(UG/L)	ug/L	<4	6.3 J	<4	<2.9	<2.9	<2.9	<2.9	<3.4	<3.4	<3.4
P-ISOPROPYLTOLUENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	<5	6.7 J	<5	<3	<3	<3	<3	<2.9	<4.2	<2.9
2-METHYLNAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NA	<2.5	NA	<2.5	NA	0.35 J	NA	<2.5	NA	0.51 J
CARBAZOLE	ug/L	NA	<2.4	NA	<2.3	NA	<0.66	NA	<6.7	NA	1.5 J
ETHYLBENZENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	<3	17	3 J	4.1 J	<3	<3	<3	<4.2	<7.4	<4.2
ACETONE IN WHL WTR SAMPLE (UG/L)	ug/L	<90	720	<90	<40	<40	<40	<40	<41	<40	<41
ACETOPHENONE IN WHL WTR SAMPLE (UG/L)	ug/L	NA	<2.4	NA	<2.3	NA	0.82 J	NA	<4.7	NA	0.88 J
METHYL ETHYL KETONE (MEK) IN WHL WTR SAMPLE (UG/L)	ug/L	<40	990	<40	<26	<26	<26	<26	<29	<26	<29
TETRAHYDROFURAN IN WHOLE WATER SAMPLE (UG/L)	ug/L	270	340	180	270	320	320	380	410	300	230
1-METHYLNAPHTHALENE IN WHOLE WATER SAMPLE (UG/L)	ug/L	NA	<2.3	NA	8.3 J	NA	0.64 J	NA	<2.6	NA	0.6 J
XYLENE, M & P-, IN WHOLE WATER SAMPLE (UG/L)	ug/L	<5	23	<5	7.1 J	<7	<7	<7	<7.4	<7	<7.4

Notes:
(1) - Any parameter analyte that consistently measured below the limit of detection was not included.
J - Values are between the laboratory limit of detection and limit of quantification.
NA - Parameter not analyzed.
< - Value was not detected at concentration at or above the method detection limit.

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Appendix T

Clay Borrow Source Quality Information

T-1 – Clay Borrow Source A Information
T-2 – Clay Borrow Source B Information
T-3 – Updated Isopach Maps for Clay Borrow Areas

T-1 – Clay Borrow Source A Information

park or natural area. The balefill itself should remain undeveloped, as the side slopes and unstable fill would preclude its use for agriculture or residential construction.

7.0 IDENTIFICATION/CHARACTERIZATION OF BORROW SOURCES

7.1 General Information

7.1.1 Location

Vernon County intends to continue using materials from the balefill property for daily cover and for the construction of the final cover system (note that the proposed vertical expansion would not require the construction of any additional liner beneath the waste). Therefore, the location of the proposed borrow sources is the same as that of the proposed balefill expansion:

> The SE ¼ of the SW ¼, the SW ¼ of the SE ¼, the SE ¼ of the SE ¼, the S ½ of the NW ¼ of the SE ¼, and the E ½ of the NE ¼ of the SW ¼ all in Section 15, Township 13 North, Range 4 West, Town of Viroqua, Vernon County, Wisconsin.

The property, which encompasses 253 acres, is already owned by Vernon County.

7.1.2 Present Land Uses

The proposed site is already used for a balefill and a construction/demolition wastes landfill. Land use within one mile of the proposed fill limits is primarily agricultural. To the west and south of this site, most land is in crops or pasture. Wooded land to the northeast is used for timber and private hunting. The Vernon County Solid Waste Management Plan indicates that there are no scientific or natural areas, State parks, or County forest lands within several miles of the property under consideration.

7.1.3 Transportation Routes

Because the borrow sources would be located on the same property as the proposed balefill expansion, the hauling of daily cover and liner system construction materials would not involve the use of any public roads as transportation routes.

7.1.4 Access Restrictions

Because the borrow sources would be located on the same property as the proposed balefill expansion, there would be no access restrictions to obtaining materials for daily cover and liner system construction.

7.1.5 Hydrologic Features

The proposed borrow source property is situated mostly along the top of a ridge between Seas Branch and an intermittent tributary to Seas Branch (see Plan Sheet 3). Consequently, there are no permanent surface water features present at the site. The natural topography directs runoff either to the north (into Seas Branch valley) or to the southwest (into the intermittent stream). Ultimately, all runoff from the site enters Seas Branch, which is impounded by an artificial dam located roughly one mile northeast of the site (see Plan Sheet 3). Approximately two miles downstream from this dam, Seas Branch joins the West Fork Kickapoo River.

There are no wetlands within at least one mile of the proposed site, but springs sometimes occur along valley walls of the larger streams. One such spring (Crume Spring) occurs less than 1,500 feet north of northernmost property border, across Seas Branch valley (see Plan Sheet 3). Springs in this setting are the result of perched groundwater reaching the land surface along lowly permeable shale beds within the Prairie du Chien Group.

7.1.6 Natural or Historical Areas

A letter from the WDNR Bureau of Endangered Resources iondicates that there are no endangered resources and no environmentally unique areas within Section 15 of T13N, R4W (see Appendix G). Correspondence from the WDNR State Archaeologist also indicates that no known archaeological or historical sites exist on the property (see Appendix H). It should be noted that an archaeological survey of the site was undertaken by Joyce McKay of Cultural Resources Consultants in 1988 as part of the feasibility study for the existing sanitary balefill. McKay's report concluded that "no significant prehistoric or historic occupation" occurred within the proposed fill area (see Appendix H).

7.1.7 Initial Site Inspection

The proposed borrow site was visited by Mr. Michael C. Degen, WDNR solid waste specialist, on July 16, 1987.

7.2 Field and Lab Investigations

7.2.1 Test Pits

On October 19, 1989, a qualified representative from CWEA supervised the excavation of 29 test pits in the proposed clay borrow source area. This area encompasses approximately 25 acres within the balefill property and includes most of the balefill waste limits. The 29 test pits used to characterize the clay borrow source exceeds the minimum number required by s. NR 512.15(2)(a) for a 25-acre area (the minimum number is 17 test pits). In addition, the information obtained from several test borings (TB-4, TB-5, TB-6, TB-7, TB-8, TB-11, and TB-12) and auger borings was used to construct a clay isopach map. The locations of test pits (which were spaced between 100 and 200 feet apart) are shown on Plan Sheets 25 and 26.

The depths of test pit excavation varied between 5 and 14 feet, with most pits extending to 8 or 9 feet below land surface (see Appendix Z for test pit logs). Each major unit encountered in these pits was described based on field observations and the results of analyzing samples in the laboratory.

7.2.2 Soil Samples

A total of 45 samples from 18 test pits were analyzed for grain size distributions and Atterberg limits. Eight samples (each from a different pit) were also submitted for five-point modified Proctor tests and falling-head permeability tests. The results from all laboratory analyses conducted on test pit soil samples are contained in Appendix Z.

7.2.3 Results of Investigation

The surficial geologic materials encountered in test pits are the same as those previously described under Section 4.0 (Subsurface Data Analysis). The upper 14 feet of subsurface material exposed in test pits includes loess (wind blown deposits of silt and clay) and weathered bedrock residuum.

Appendix Z contains a table that summarizes the results of laboratory analyses. This table shows that all but four of the 45 samples submitted for grain size distribution analysis met the s. NR 504.06(2)(a) requirement of having at least 50 percent by weight pass the 200 sieve (the average P-200 for all samples is 82.8 percent, and the average clay content is 31.3 percent). Three of the four samples that did not meet this standard were collected from the bottom of a test pit, beneath the layer of acceptable clay material.

The results of the Atterberg limits tests showed that all samples with greater than 50 percent P-200 had a liquid limit greater than 25 percent (the average is 55.1 percent) and a plasticity index greater than 12 percent (the average is 21.1 percent). This exceeds the requirements of s. NR 504.06(2)(a)3 and 4 for clay used in landfill liners.

The eight samples submitted for Proctor tests (ASTM D1557-78, Method A) revealed maximum dry densities that range between 109 and 118 lbs/ft^3 (average of 114.5 lbs/ft^3) and optimum moisture contents that vary from 13 to 19 percent (average of 16.2 percent). Falling-head permeability tests conducted on two of these samples yielded saturated hydraulic conductivity values that range between $9.47X10^{-9}$ and $1.03X10^{-8}$ cm/sec. These results exceed the minimum requirements of s. NR 504.06(2)(a)2.

7.3 Data Presentation

7.3.1 Volume of Acceptable Clay

An estimate of clay volume that can be excavated from the proposed borrow site was made based on an isopach map showing the thickness of acceptable material (see Plan Sheet 25). This map indicates that clay extends over an area of approximately 25 acres and includes roughly 315,300 cubic yards of clay; however, some of this material has already been excavated and stockpiled onsite during Phase I and Phase II construction. The total volume of clay required to cap the existing facility is 32,300 cubic yards. The proposed vertical expansion will increase that volume by 500 cubic yards, bringing the total clay volume required to 32,8000 cubic yards.

7.3.2 Clay Separation Methods

A methodology for separating acceptable from unacceptable soil material is required by s. NR 512.15(3)(d). When the clay that is already stockpiled onsite was excavated, a technician from CWEA was present to supervise the process. The decision to accept or reject excavated soil was made based on visual inspection in the field; however, samples were collected periodically for lab analyses to provide quality control on the technician's judgment. This same procedure will be used in the future as additional material is excavated in the Phase III area.

7.3.3 Abandonment

Plan Sheet 26 shows the proposed final grades for the borrow source area after the required clay has been excavated.

8.0 ENVIRONMENTAL REVIEW

8.1 Project Summary

8.1.1 Overview

Vernon County owns and operates a municipal solid waste balefill and a construction/demolition waste landfill on a property located in the Town of Viroqua (see Plan Sheet 1). Because both of these facilities are expected to reach capacity within five years, the Vernon County Solid Waste Planning Committee began studying the county's future waste disposal options in 1999. That process culminated in a revised solid waste management plan which identified vertical expansion of the existing balefill as the most cost-effective option to meet future waste disposal needs. The proposed balefill expansion would have a capacity of 165,000 tons, brining the total balefill capacity to 352,000 tons. It is anticipated that the added capacity would extend the balefill's life by roughly six years (through 2016).

8.1.2 ISR Opinion Letter

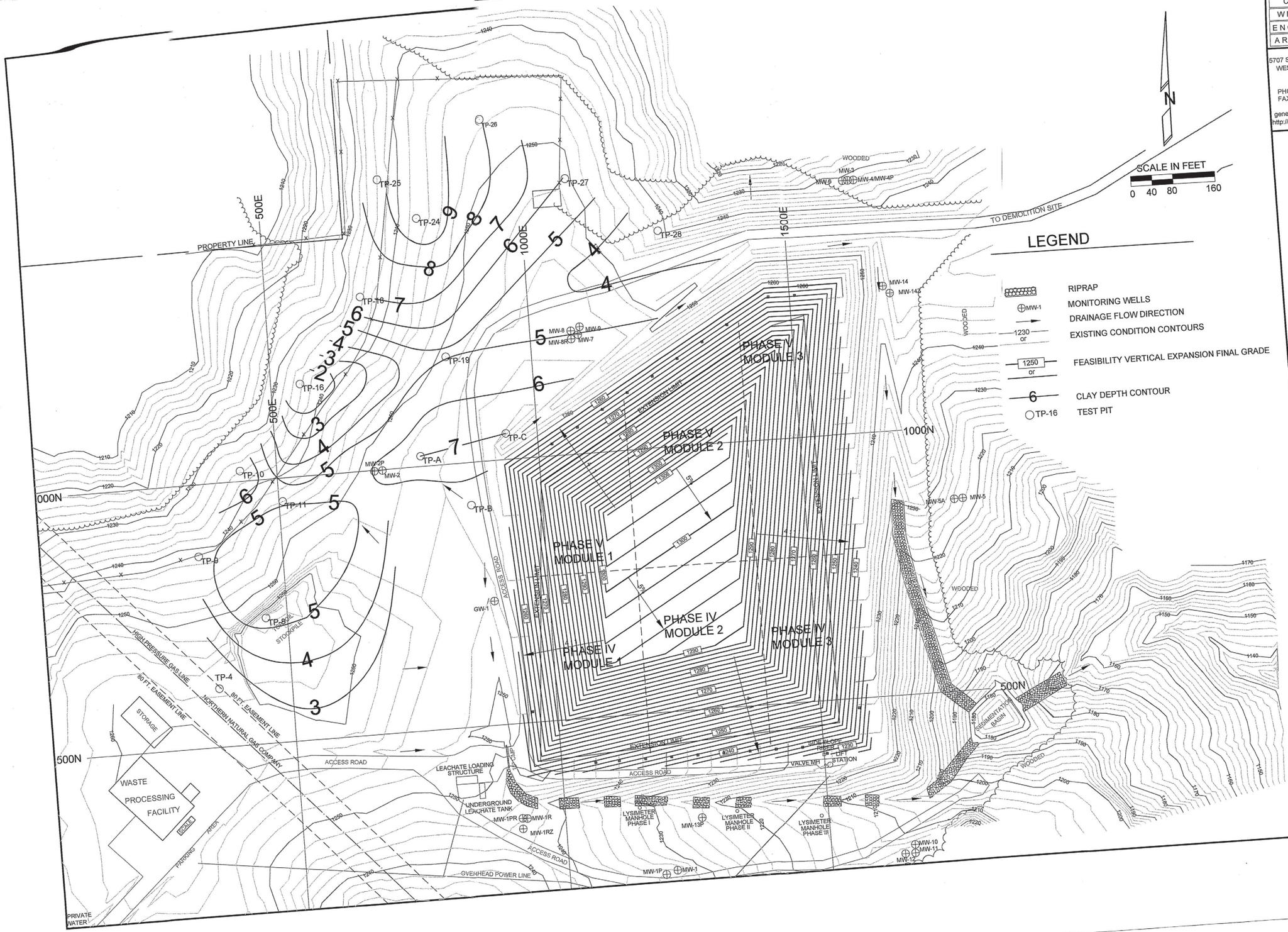
The site of the proposed vertical expansion was visited by WDNR waste program manager David Lundberg on May 22, 2002, who found no obvious violations of the locational criteria in s. NR 504.04(3) or of the performance standards in 504.04(4)(a) through (c). An initial site report was then submitted in July 2002, and the Department issued a favorable opinion of the site's potential for a vertical expansion on October 23, 2002 (see Appendix C).

8.1.3 Authority and Permits

The Vernon County Solid Waste Management Committee was created in June 1986 by action of the County Board. In accordance with Section 59.07(135) of the Wisconsin Statues, this committee has the authority to establish operations and methods of waste management as are deemed appropriate, including landfills. The licensing process being followed for this proposed balefill vertical expansion is in accordance with Wisconsin Statutes Chapter 289, which requires that an initial site report and a feasibility report be submitted to the WDNR for approval. The applicable WDNR requirements for these reports are contained in ch. NR 509 and 512 of the Wisconsin Administrative Code.

The proposed balefill construction and borrow source excavation will not disturb any wetlands, so s. NR 1.95 and s. NR 299 do not apply, nor will a U.S. Army Cops of Engineers 404 permit be required. Likewise, this project will have no effect on navigable waters, so Wisconsin Statutes Chapter 30 are not applicable. However, because balefill construction and borrow source excavation create point sources of construction site stormwater discharge, it is necessary to meet the applicable requirements of s. NR 216.

As discussed in Section 5.4.1, exceedances of the s. NR 140 groundwater quality standards for fluoride, iron, manganese, and nitrate+nitrite have been detected during baseline monitoring.



CWEA
CENTRAL WISCONSIN ENGINEERS & ARCHITECTS
5707 SCHOFIELD AVENUE
WESTON, WISCONSIN
54476
PHONE: (715) 359-9400
FAX: (715) 355-4199
general@cwengineers.com
http://www.cwengineers.com

PROJECT:

CLAY ISOPACH MAP
FOR CLAY COVER
VERNON COUNTY SANITARY BALEFILL
INITIAL SITE REPORT FOR VERTICAL EXPANSION

REVISIONS:

DRAWN BY: D.H.
CHECKED BY: D.P.
APPROVED BY: D.O.
DATE: AUG 2003

SHEET: 25 OF 31

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CWEA
CENTRAL WISCONSIN ENGINEERS & ARCHITECTS

5707 SCHOFIELD AVENUE
WESTON, WISCONSIN
54476

PHONE: (715) 359-9400
FAX: (715) 355-4199

general@cwengineers.com
http://www.cwengineers.com

PROJECT:

CLAY BORROW SITE FINAL GRADES
VERNON COUNTY SANITARY BALEFILL
INITIAL SITE REPORT FOR VERTICAL EXPANSION

REVISIONS:

DRAWN BY: D.H.

CHECKED BY: D.P.

APPROVED BY: D.O.

DATE: AUG 2003

SHEET: 26 OF 31

P:\DRAFT\940000 VERNON CO BALEFILL\AT CLOSURE.dwg, CLAY BORROW, 08/21/2003 11:42:17 AM

APPENDIX Z

Soil Laboratory Analyses for Clay Borrow Source

Central Wisconsin
Engineers

P. O. BOX F • SCHOFIELD, WI 54476 • (715) 842-9500

FINAL TEST INFORMATION

PROJECT: Vernon County Clay Search JOB NO. 70389 DATE 10/19/89

Boring No.	Sample No.	Depth	Field Class	GRADATION - % PASSING									LL	PI	USCS	Wn %	e	Yd P.C.F.	GS	k -(CM/S)
				.005	.02	.200	100	#40	#10	#4	3/8"	3/4"								
TP-7	S1-7	1.5'-2'		28.0	58.0	99.53	100%	100%	100%	100%	100%	100%	37.7	19.4	CL					
	S2-7	3'-4.5'		26.0	50.0	88.58	89.72	96.06	98.79	99.39	100%	100%	35.0	15.22	CL					
	S3-7	6'-8'		50.0	65.0	78.53	81.07	92.06	94.02	94.49	94.72	100%	56.0	29.91	CH					
TP-8	S1-8	3'-4'		25.0	52.0	98.25	98.71	100%	100%	100%	100%	100%	39.6	16.8	CL					
	S2-8	5'-5.5'		26.0	38.0	52.8	58.57	85.3	90.65	92.73	95.58	100%	42.3	23.52	CL					
	S3-8	6'-7'		25.0	49.0	95.3	96.41	98.30	99.38	100%	100%	100%	54.8	29.37	CH					
TP-9	S2-9	3'-4'		20.0	41.0	73.53	75.95	88.48	94.65	96.9	100%	100%	37.0	17.27	CL					
	S3-9	5'-6'		40.0	56.0	72.87	76.75	88.26	93.43	94.79	96.76	100%	54.5	27.99	CL					
TP-10	S1-10	2'-3'		27.0	56.0	98.71	100%	100%	100%	100%	100%	100%	40.0	18.1	CL					
	S2-10	6'-7'		29.0	36.0	43.54	45.58	76.81	98.54	99.0	100%	100%	48.9	24.32	CL					
	S3-10	9'-10'		68.0	84.0	96.89	97.49	99.43	100%	100%	100%	100%	113.5	56.36	Pt					
TP-11	S1-11	1'-2'		27.0	54.0	94.5	95.37	97.23	98.42	99.17	100%	100%	39.5	16.55	CL					
	S2-11	3.5'-4'		42.0	53.0	73.59	77.18	92.57	96.34	97.39	98.36	100%	47.8	25.92	CL					
	S3-11	6'-7'		—	—	33.55	35.27	72.49	98.73	99.48	100%	100%	—	—						
TP-13	S1-13	2'-3'		26.0	54.0	99.45	100%	100%	100%	100%	100%	100%	42.2	17.99	CL					
	S2-13	5'-6'		39.0	58.0	78.43	81.61	95.46	98.83	99.17	100%	100%	58.8	31.62	CH					
TP-14	S2-14	4'-5'		27.0	53.0	99.47	100%	100%	100%	100%	100%	100%	36.8	15.36	CL					
	S3-14	7'-8'		23.0	52.0	98.42	100%	100%	100%	100%	100%	100%	40.5	17.51	CL					
	S4-14	9'-10'		31.0	41.0	61.63	60.38	88.76	94.87	95.99	97.58	100%	42.7	21.18	CL					
TP-15	S1-15	1'-2'		27.0	58.0	99.63	100%	100%	100%	100%	100%	100%	41.4	16.27	CL					
	S2-15	3'-4'		22.0	52.0	99.56	100%	100%	100%	100%	100%	100%	38.3	17.03	CL					
	S3-15	8'-9'		—	—	29.12	36.90	90.37	99.02	99.17	100%	100%	—	—	—					
TP-20	S1-20	2'-3'		26.0	53.0	99.77	100%	100%	100%	100%	100%	100%	36.3	15.12	CL					
	S2-20	4'-5'		27.0	56.0	99.71	100%	100%	100%	100%	100%	100%	41.5	18.19	CL					

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FINAL TEST INFORMATION

PROJECT: Vernon County Clay Search JOB NO. 70389 DATE 10/19/89

Boring No.	Sample No.	Depth	Field Class	GRADATION - % PASSING									LL	P1	USCS	Wn %	M %	D.D. P.C.F.	GS	k -(CM/S)
				.005	.02	.200	100	#40	#10	#4	3/8"	3/4"								
TP-20	S3-20	8'-9'		16.0	54.0	99.70	100%	100%	100%	100%	100%	100%	36.5	15.05	CL		26.8			
	S4-20	10'-11'		39.0	51.0	61.21	66.18	93.35	99.50	99.65	100%	100%	45.0	23.33	CL					
TP-21	S1-21	2'-3'		30.0	60.0	99.73	100%	100%	100%	100%	100%	100%	41.3	19.31	CL					
	S2-21	6'-7'		28.0	56.0	99.64	100%	100%	100%	100%	100%	100%	37.4	15.39	CL					
	S3-21	10'-11'		32.0	47.0	59.81	64.32	84.52	93.74	94.81	95.94	100%	55.5	30.8	CH					
TP-22	S1-22	3'-4'		19.0	55.0	99.81	100%	100%	100%	100%	100%	100%	38.8	15.58	CL		23.3			
	S3-22	9'-10'		36.0	58.0	75.36	78.07	93.44	97.83	98.99	100%	100%	49.5	23.56	CL		25.2			
TP-25	S1-25	1.5'-2.5'		25.0	52.0	98.09	98.4	98.94	99.5	100%	100%	100%	38.3	15.45	CL					
	S2-25	4'-5'		57.0	72.0	78.85	81.25	92.66	98.97	100%	100%	100%	63.6	35.71	CH					
TP-27	S1-27	1.5'-2.5'		27.0	52.0	98.95	99.26	99.49	99.66	99.79	100%	100%	40.5	17.6	CL		21.5			
	S2-27	4'-5'		50.0	68.0	84.04	86.28	95.59	98.59	99.56	100%	100%	65.0	32.55	CH		21.1			
	S3-27	7'-9'		—	—	32.24	41.38	83.5	100%	100%	100%	100%	—	—	—		20.1			
TP-A	S1-A	4'-5'		54.0	73.0	91.49	92.16	98.1	99.29	99.58	100%	100%	62.8	32.36	CH					
	S2-A	7'-8'		50.0	63.0	78.64	80.61	93.6	98.64	100%	100%	100%	58.2	30.99	CH					
TP-B	S1-B	3'-4'		34.0	59.0	96.40	96.99	98.12	98.68	99.04	100%	100%	38.9	16.38	CL					
	S2-B	5'-6'		39.0	51.0	73.09	76.61	94.61	99.69	100%	100%	100%	45.3	22.72	CL					
	S3-B	8'-9'		69.0	73.0	84.76	87.24	96.74	99.09	99.46	100%	100%	63.5	32.48	CH		18.0			
TP-C	S1-C	3'-3.5'		26.0	54.0	99.46	100%	100%	100%	100%	100%	100%	34.9	15.09	CL					
	S2-C	5'-6'		30.0	57.0	99.0	100%	100%	100%	100%	100%	100%	43.8	20.78	CL		19.9			
	S3-C	7'-8'		42.0	51.0	60.91	64.92	88.51	93.51	94.92	97.7	100%	54.2	28.7	CL					
TP-D	S1-D	3'-4'		24.0	51.0	98.94	99.16	100%	100%	100%	100%	100%	41.1	16.23	CL					
TP-12	S2-12																22.7	104.65		9.47×10^{-9}
TP-12	S2-12																24.8	100.24		7.79×10^{-9}
TP-12	S2-12																18.64	109.74		2.66×10^{-8}
TP-12	S2-12																15.89	107.43		1.03×10^{-8}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 70389

Sample No.: S2-12 (Proctor Case Test #1)

Sample Description: Clay

Sample Diameter: 5.4 cm

Sample Height (L): 6.8 cm

Sample Area (A): 22.89 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 107.43 pcf

Moisture Content (Initial): 15.89%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	64,800	193.1	192.8	1.26×10^{-8}
2	108,000	192.8	192.6	5.05×10^{-9}
3	86,400	192.6	192.1	1.58×10^{-8}
4	68,400	192.1	191.9	8.00×10^{-9}
		Ave. K_T =		1.03×10^{-8}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 70389

Sample No.: S2-12 (Proctor Case Test #2)

Sample Description: Clay

Sample Diameter: 5.8 cm

Sample Height (L): 7.2 cm

Sample Area (A): 26.40 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 109.74

Moisture Content (Initial): 18.64

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	72,000	187.5	186.4	3.94×10^{-8}
2	108,000	186.4	184.3	5.06×10^{-8}
3	86,400	184.3	184.0	9.10×10^{-9}
4	68,400	184.0	183.8	7.67×10^{-9}
		Ave. K_T =		2.66×10^{-8}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 70389

Sample No.: S2-12 (Proctor Case Test #3)

Sample Description: Clay

Sample Diameter: 5.7 cm

Sample Height (L): 7.3 cm

Sample Area (A): 25.5 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 104.65

Moisture Content (Initial): 22.71%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	72,000	194.8	194.5	1.08×10^{-8}
2	108,000	194.5	194.1	9.65×10^{-9}
3	86,400	194.1	193.9	6.04×10^{-9}
4	68,400	193.9	193.6	1.14×10^{-8}
		Ave. K_T =		9.47×10^{-9}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 70389

Sample No.: S2-12 (Proctor Case Test #4)

Sample Description: Clay

Sample Diameter: 5.7 cm

Sample Height (L): 7.2 cm

Sample Area (A): 25.5 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 100.24

Moisture Content (Initial): 24.8%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	72,000	193.1	193.0	3.59×10^{-9}
2	108,000	193.0	192.7	7.19×10^{-9}
3	86,400	192.7	192.4	9.01×10^{-9}
4	68,400	192.4	192.1	1.14×10^{-8}
		Ave. K_T =		7.79×10^{-9}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 703

Sample No.: S-8 Proctor Case Test No. 2

Sample Description: Clay

Sample Diameter: 5.9 cm

Sample Height (L): 7.0 cm

Sample Area (A): 27.33 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 116.92 pcf

Moisture Content (Initial): 12.38%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h^f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	90000	192.4	191.5	2.36×10^{-8}
2	83400	191.5	190.9	1.70×10^{-8}
3	85800	190.9	190.2	1.94×10^{-8}
4	86700	190.2	189.4	2.20×10^{-8}
5	261600	189.4	187.3	1.93×10^{-8}
6	89100	187.3	186.8	1.36×10^{-8}
7	86400	186.8	186.4	1.12×10^{-8}
8	102600	186.4	185.8	1.42×10^{-8}
9	86400	185.8	185.0	2.26×10^{-8}
			Ave. K_T	1.81×10^{-8}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 703

Sample No.: S-8 Proctor Case Test No. 3

Sample Description: Clay

Sample Diameter: 5.6 cm

Sample Height (L): 6.6 cm

Sample Area (A): 24.62 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 117.92 pcf

Moisture Content (Initial): 13.21%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	90000	192.0	191.5	1.37×10^{-8}
2	83400	191.5	191.3	5.94×10^{-9}
3	89800	191.3	190.8	1.44×10^{-8}
4	86700	190.8	190.5	8.61×10^{-9}
5	261600	190.5	189.5	9.54×10^{-9}
6	89100	189.5	189.4	2.81×10^{-9}
7	86400	189.4	189.1	8.70×10^{-9}
8	102600	189.1	188.8	7.34×10^{-9}
9	86400	188.8	188.4	1.16×10^{-8}
			Ave. K_T	9.18×10^{-9}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 703

Sample No.: S-8 Proctor Case Test No. 4

Sample Description: Clay

Sample Diameter: 5.8 cm

Sample Height (L): 7.0 cm

Sample Area (A): 26.41 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 114.13 pcf

Moisture Content (Initial): 17.23%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	90000	196.6	196.0	1.59×10^{-8}
2	83400	196.0	195.4	1.72×10^{-8}
3	85800	195.4	194.7	1.96×10^{-8}
4	86700	194.7	194.0	1.11×10^{-8}
5	261600	194.0	192.8	1.11×10^{-8}
6	89100	192.8	192.4	1.09×10^{-8}
7	86400	192.4	191.9	1.41×10^{-8}
8	102600	191.9	191.4	1.19×10^{-8}
9.	86400	191.4	190.8	1.70×10^{-8}
			Ave. K_T	1.52×10^{-8}

FALLING HEAD PERMEABILITY TEST

Project: Vernon County

Project No.: 703

Sample No.: S-8 Proctor Case Test No. 5

Sample Description: Clay

Sample Diameter: 5.7 cm

Sample Height (L): 6.5 cm

Sample Area (A): 25.5 cm^2

Standpipe Area (a): 1.77 cm^2

Dry Density: 101.54 pcf

Moisture Content (Initial): 22.91%

$$K_T = \frac{aL}{At} \ln \frac{h_o}{h_f}$$

Trial No.	Duration, t (seconds)	Initial Head, Head, h_o (cm)	Final Head h_f (cm)	Permeability, K_T (cm/sec)
1	90000	195.9	191.1	1.24×10^{-7}
2	83400	191.1	187.8	9.42×10^{-8}
3	85800	187.8	185.1	7.61×10^{-8}
4	86700	185.1	182.2	8.21×10^{-8}
5	261600	182.2	174.0	7.94×10^{-8}
6	89100	174.0	171.4	7.62×10^{-8}
7	86400	171.4	168.8	7.98×10^{-8}
8	102600	168.8	166.0	7.35×10^{-8}
9	86400	166.0	163.4	8.24×10^{-8}
			Ave. K_T	8.53×10^{-8}

C) PROCTOR COMPACTION TESTS

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COMPACTION TEST

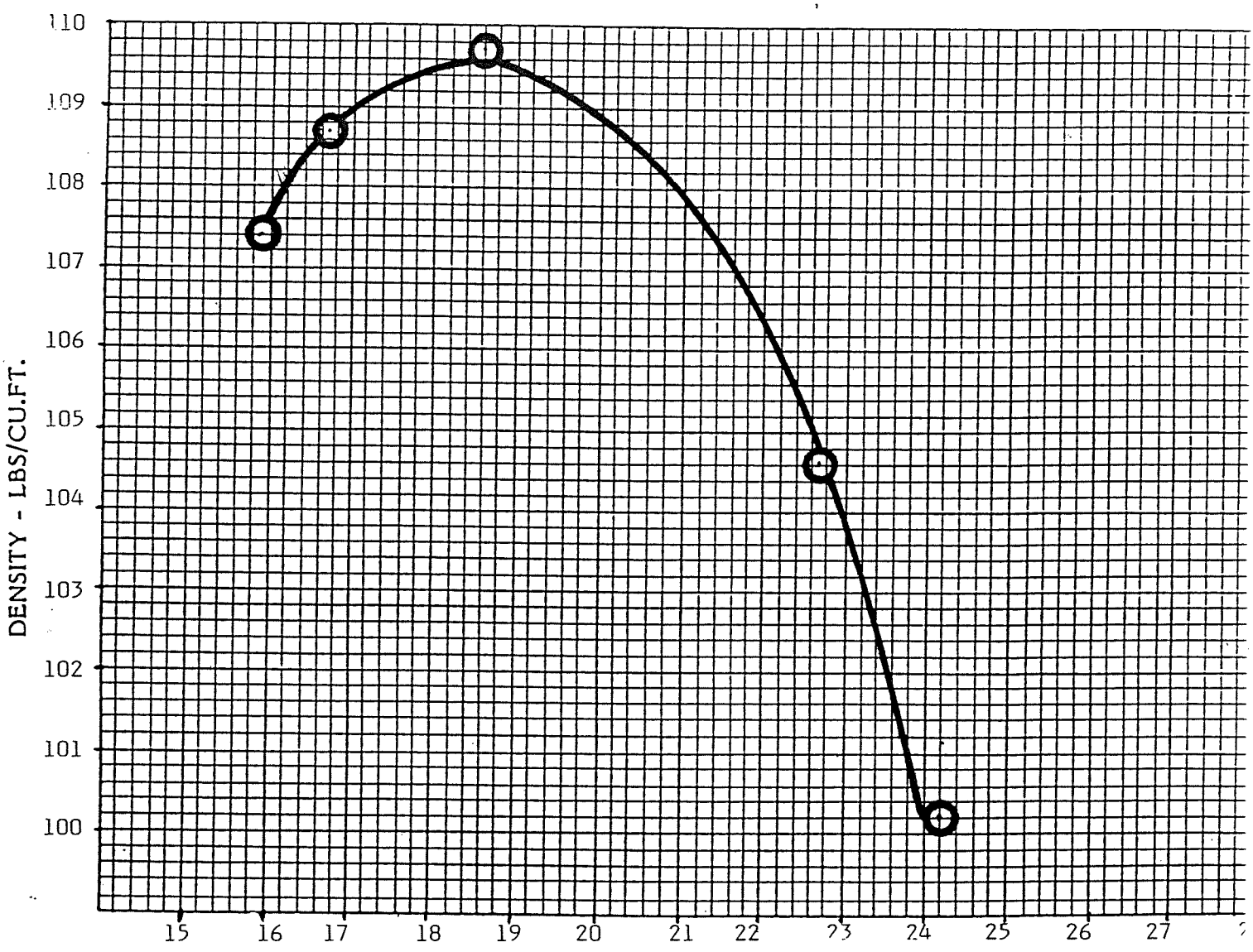
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM Vernon County Clay Search TEST NO. S-5

SAMPLE DESCRIPTION Clay SAMPLE NO. S2-12

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 109.7 LBS./CU.FT. OPTIMUM MOISTURE 18.6 %

REMARKS

TESTED BY K. Y. DATE Oct. 5 19 89

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COMPACTION TEST

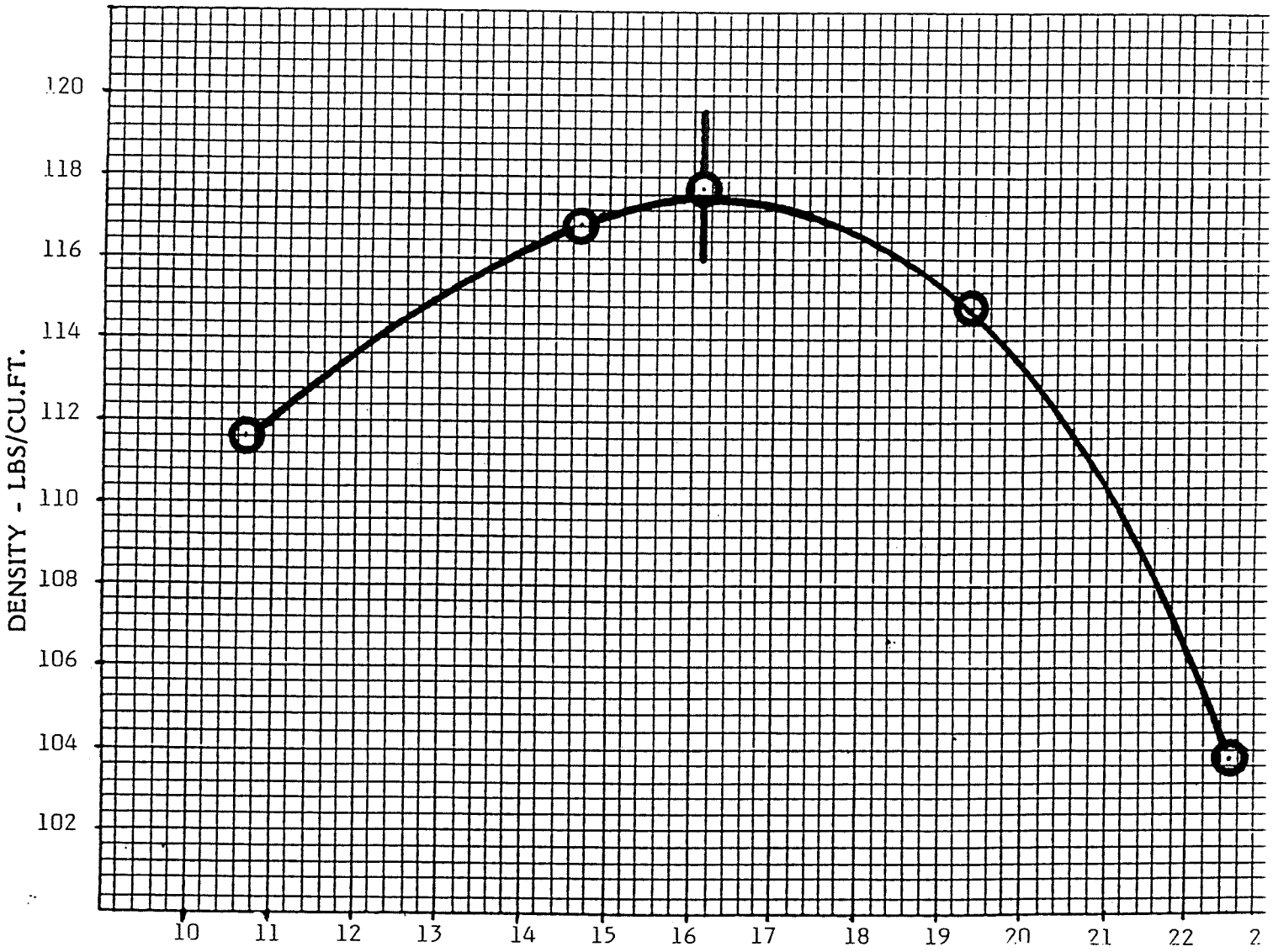
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM Vernon County Clay Search TEST NO. S-2

SAMPLE DESCRIPTION Clay SAMPLE NO. S4-8

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 117.9 LBS./CU.FT. OPTIMUM MOISTURE 16.1 %

REMARKS

TESTED BY K. Y. DATE Oct. 9 1989

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COMPACTION TEST

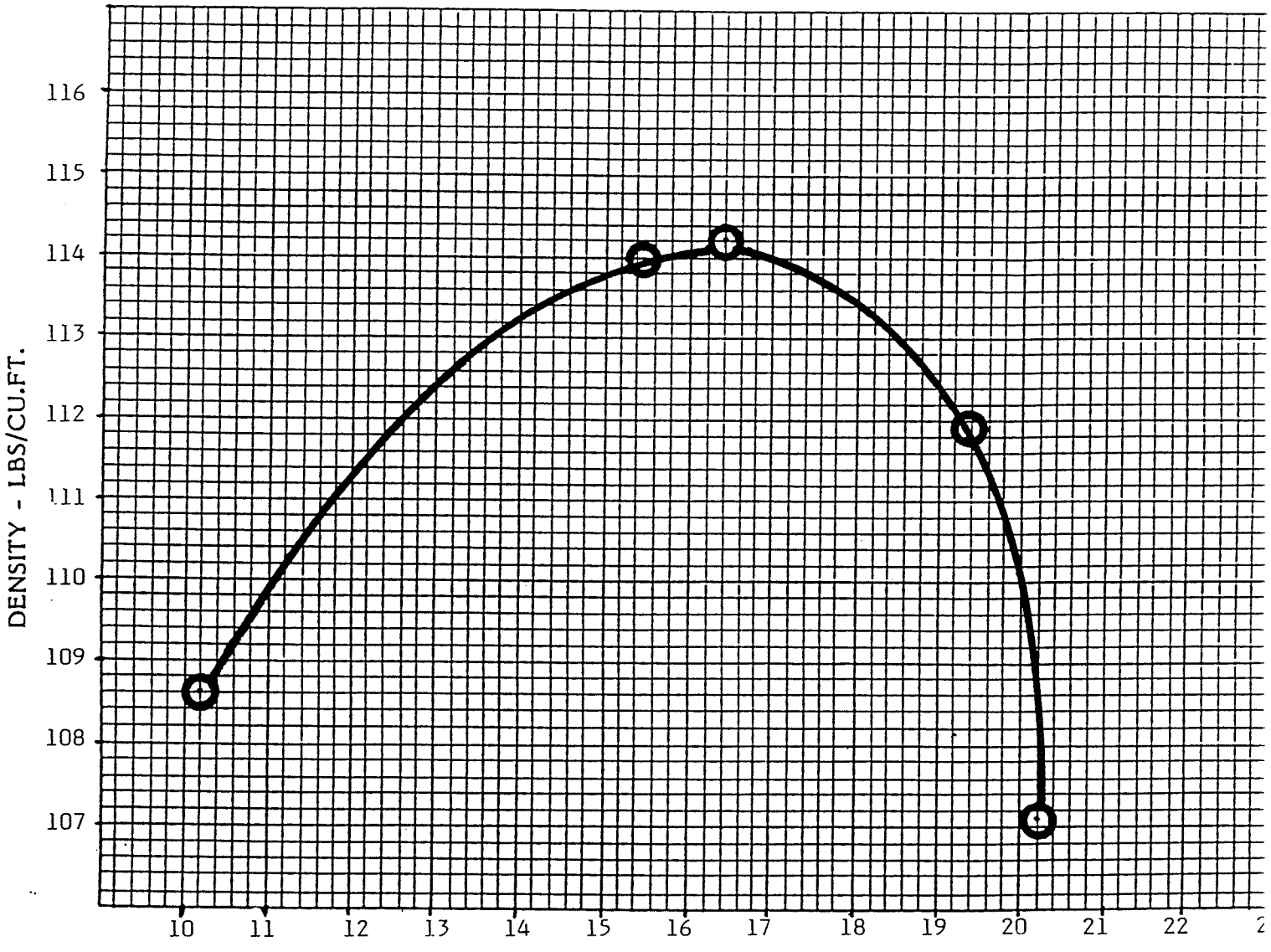
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM Vernon County Clay Search TEST NO. S-3

SAMPLE DESCRIPTION Clay SAMPLE NO. S4-13

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 114.2 LBS./CU.FT. OPTIMUM MOISTURE 16.4 %

REMARKS

TESTED BY K. Y. DATE Oct. 9 19 89

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COMPACTION TEST

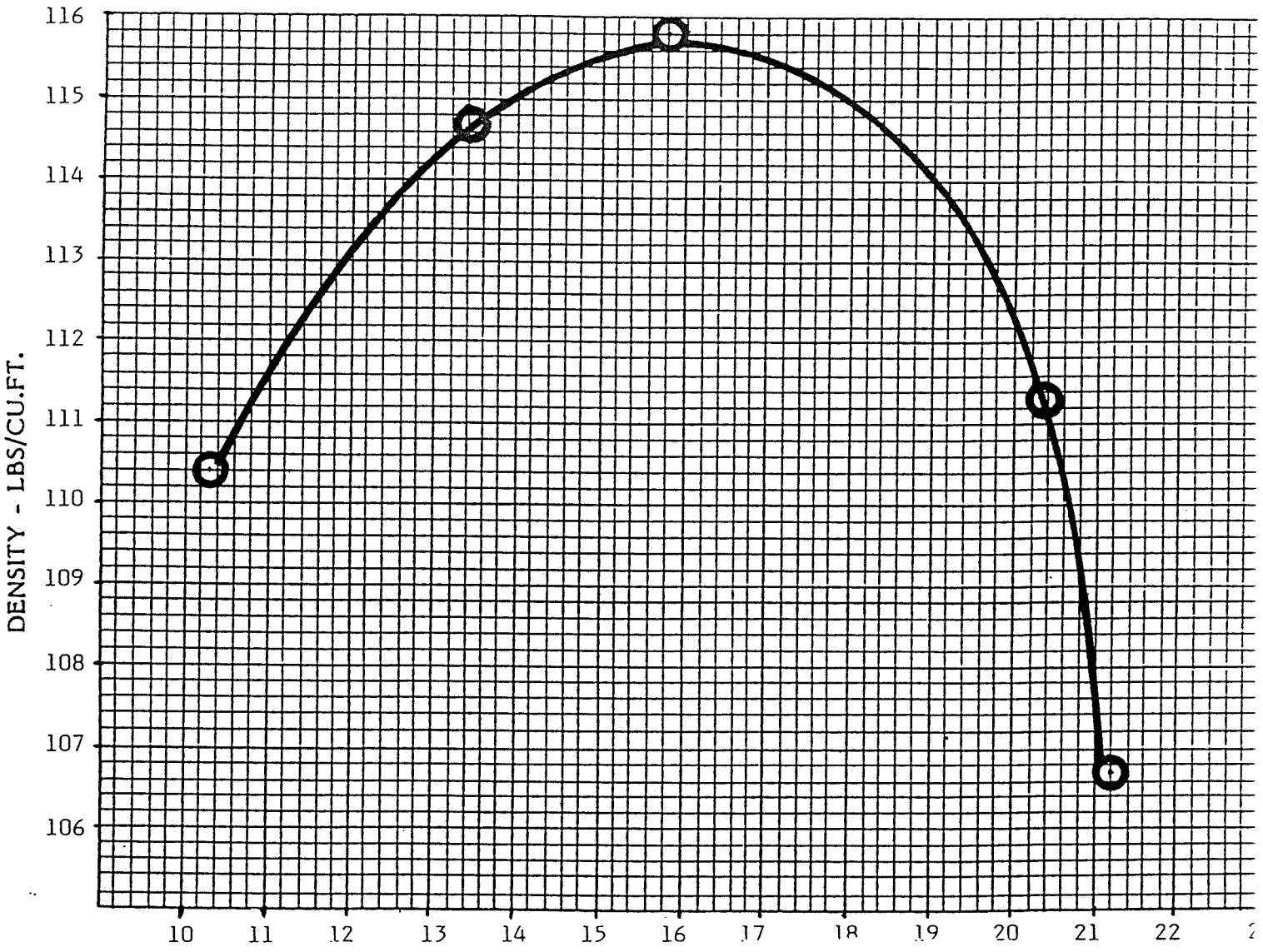
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM Vernon County Clay Search TEST NO. S-4

SAMPLE DESCRIPTION Clay SAMPLE NO. S4-15

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 115.8 LBS./CU.FT. OPTIMUM MOISTURE 15.8 %

REMARKS

TESTED BY K. Y. DATE Oct. 8 19 89

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COMPACTION TEST

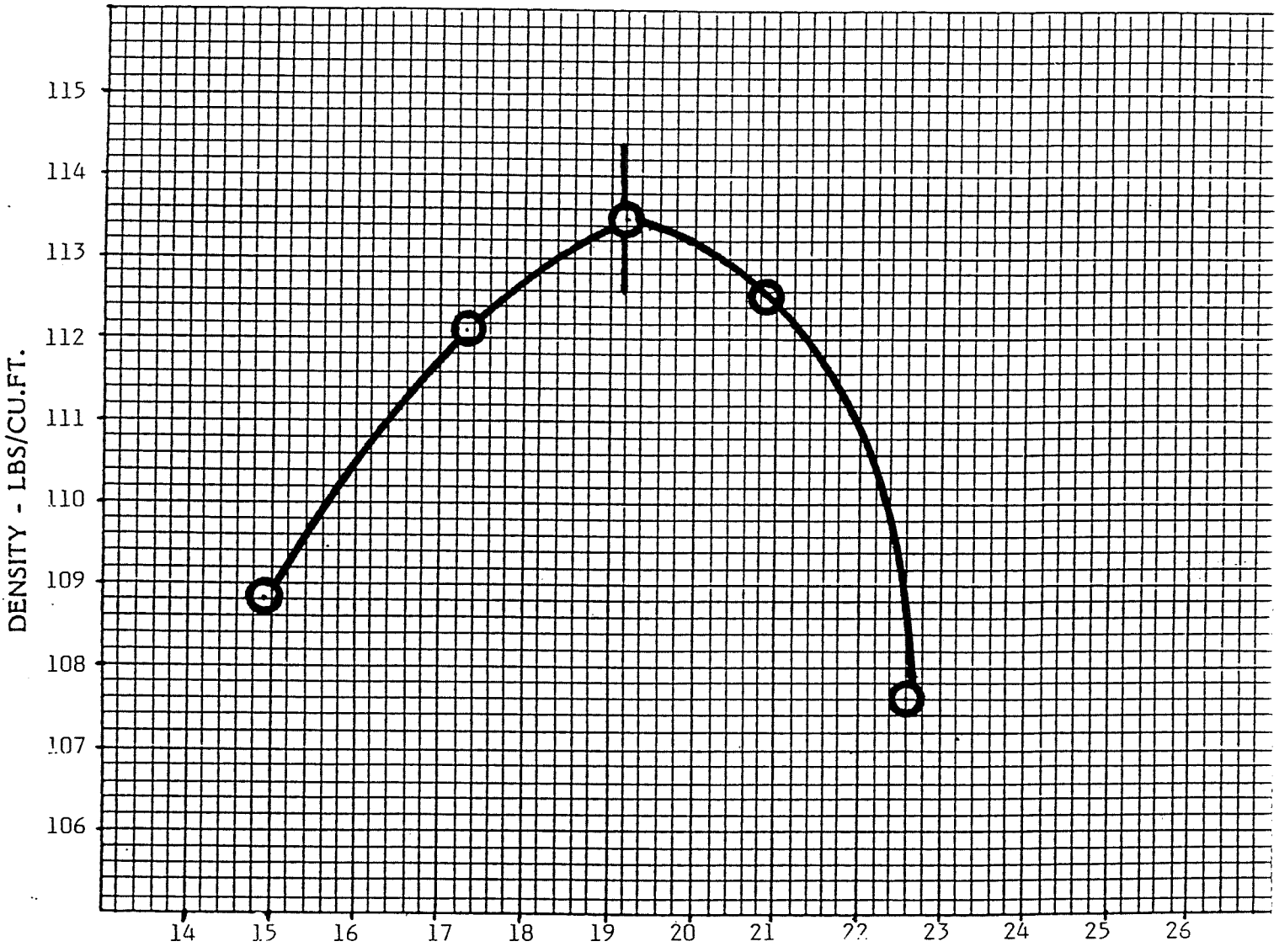
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM Vernon County Clay Search TEST NO. S-1

SAMPLE DESCRIPTION Clay SAMPLE NO. S4-23

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 113.5 LBS./CU.FT. OPTIMUM MOISTURE 19.2 %

REMARKS

TESTED BY K. Y. DATE Oct. 8 19 89

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COMPACTION TEST

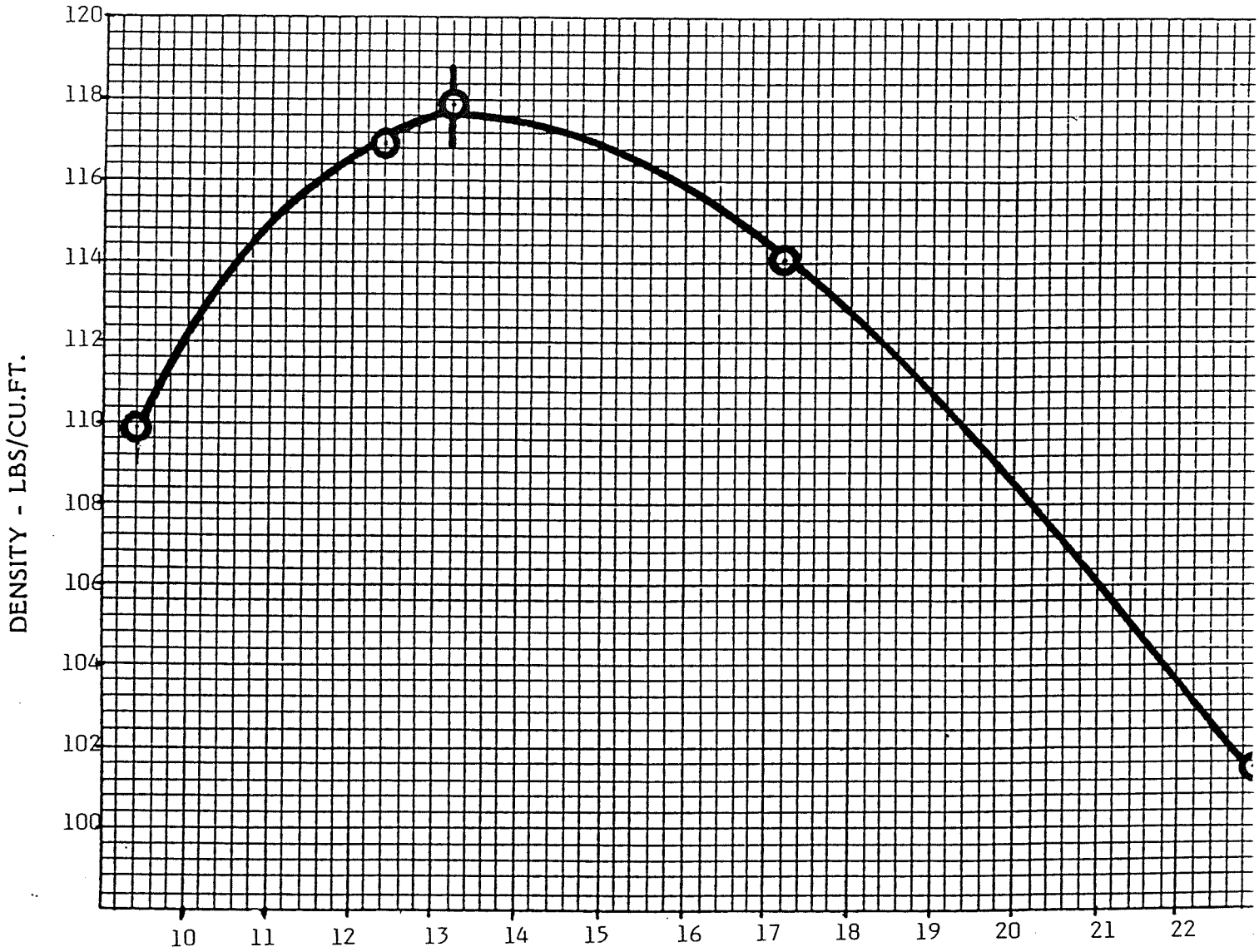
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM _____ TEST NO. 8

SAMPLE DESCRIPTION Clay SAMPLE NO. S-8

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 117.92 LBS./CU.FT. OPTIMUM MOISTURE 13.21 %

REMARKS _____

TESTED BY K.Y. DATE Jan. 9 19 90

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COMPACTION TEST

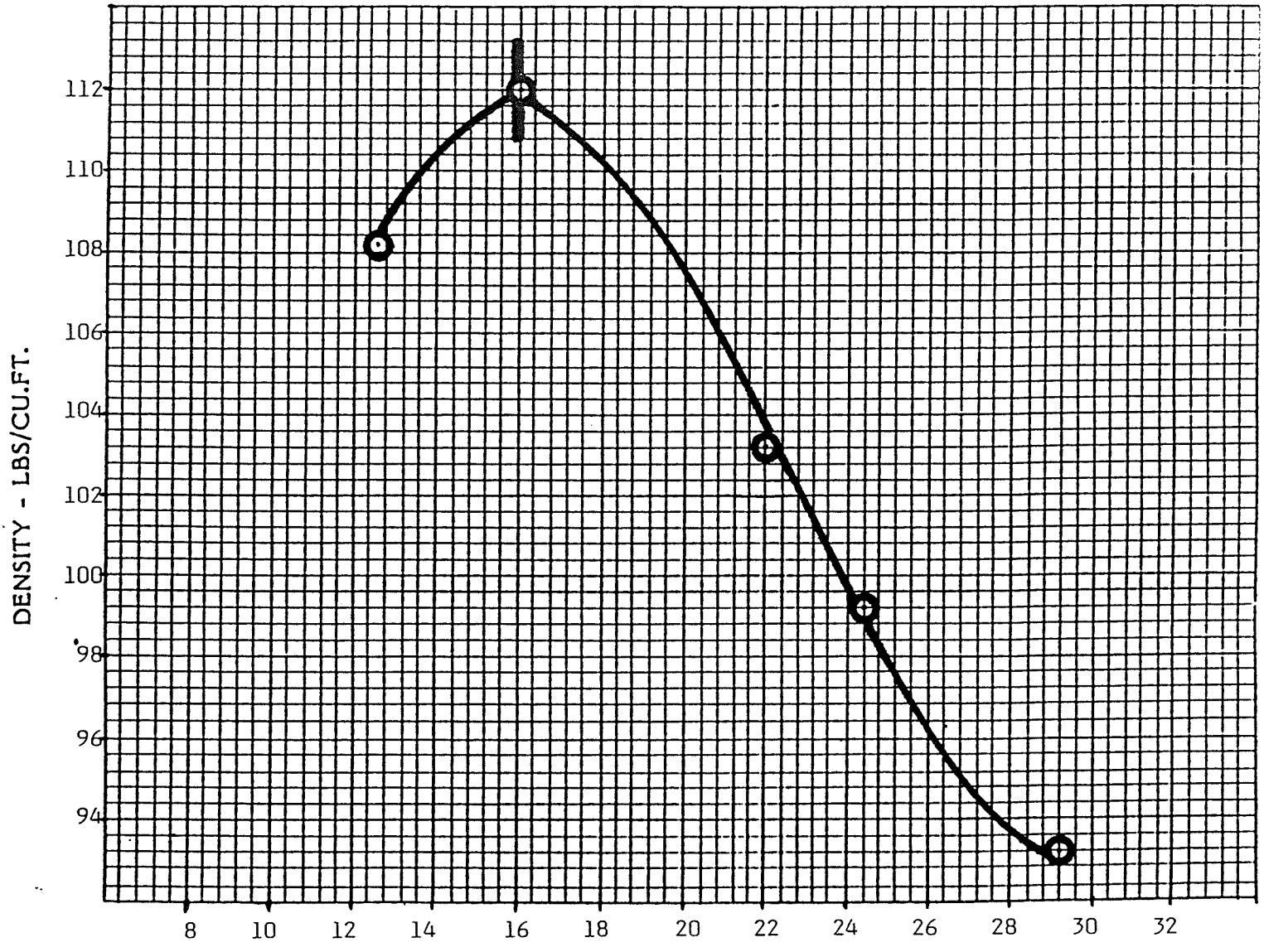
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM _____ TEST NO. 7

SAMPLE DESCRIPTION Clay SAMPLE NO. S-7

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 111.99 LBS./CU.FT. OPTIMUM MOISTURE 15.99 %

REMARKS _____

TESTED BY K.Y. DATE Jan. 4 1990

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COMPACTION TEST

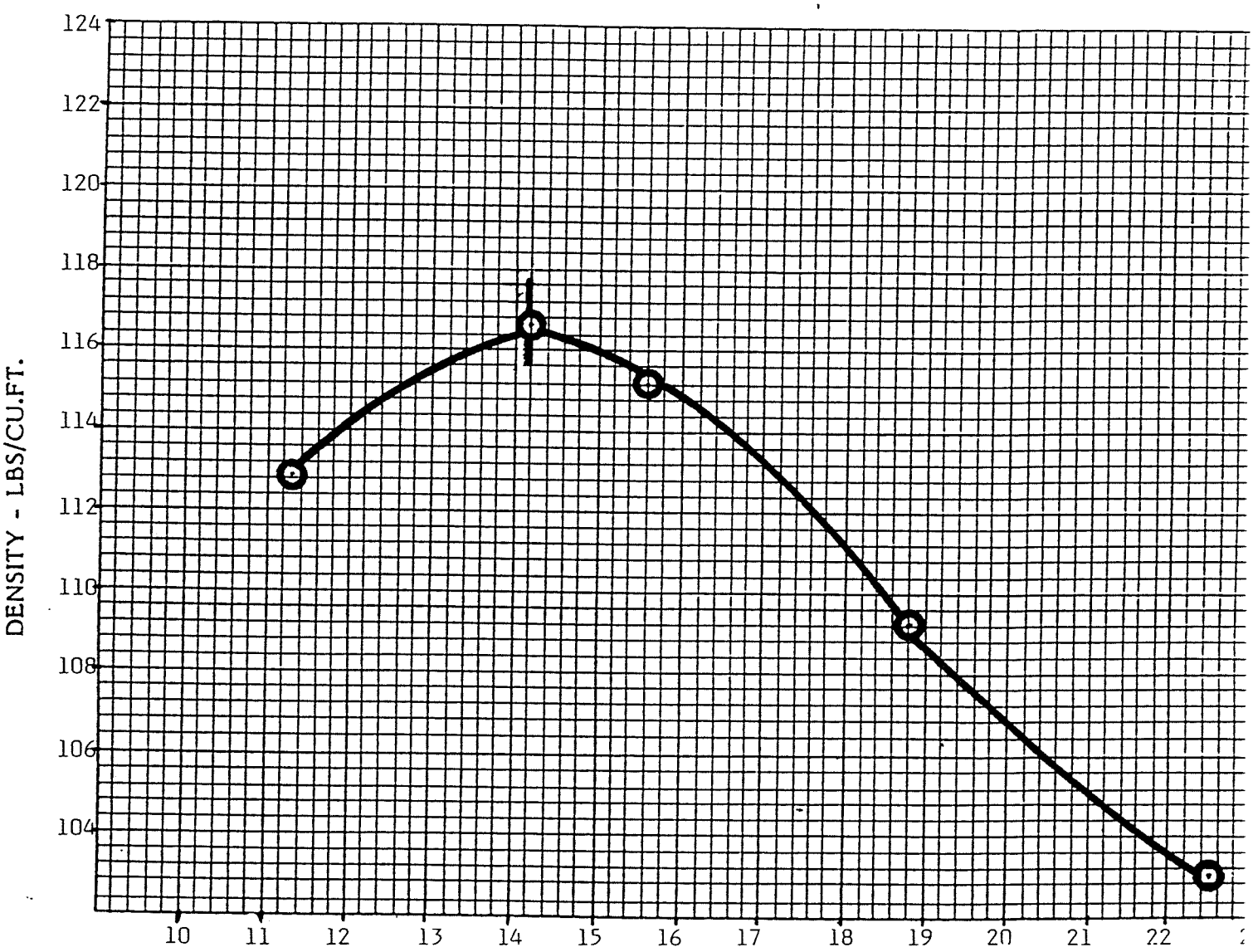
PROJECT NAME Vernon County JOB NO. 70389

SAMPLE FROM _____ TEST NO. 6

SAMPLE DESCRIPTION Clay SAMPLE NO. S-6

ASTM D1557-78 Method A MOLD SIZE 4 IN.

HAMMER WT. 10 LBS. 18 IN. 5 LAYERS 25 BLOWS/LAYER



MAIXMUM DRY DENSITY 116.64 LBS./CU.FT. OPTIMUM MOISTURE 14.20 %

REMARKS _____

TESTED BY K.Y. DATE Jan 4 19 90

T-2 – Clay Borrow Source B Information

CWE, Inc. 5707 Schofield Avenue, P.O. Box 107, Weston, WI 54476-0107 Toll Free: (800) 261-5707
Phone: (715)359-9400 Fax: (715)355-4199 Email: general@cwengineers.com Web: www.cwengineers.com

April 20, 2011

FILE COPY

Ms. Jill Schoen, Program Manager
Waste and Materials Management Program
WDNR - West Central Region Headquarters
1300 West Clairemont Avenue
P.O. Box 4001
Eau Claire, WI 54702-4001

Re: **Proposed Clay Borrow Site**
Vernon County Balefill, License No. 03268
CWEA Project No. 946-11000

Subject: **Submittal of Report for Proposed Clay Borrow Site**

Dear Ms. Schoen:

The Vernon County Balefill has an approved plan of operation to construct a vertical expansion. To insure that sufficient clay is available for balefill construction, the County desires to use an undeveloped portion of its balefill property as a clay borrow source. An investigation of this site has been completed in accordance with the requirements of s. NR 512.15, and the enclosed report summarizes the results of that investigation. On behalf of the County, CWE, Inc. asks that the Department review this report and render its opinion as to the suitability of the proposed clay borrow source.

Please feel free to contact me should you have any questions regarding this submittal or the project in general. I may be reached at (715) 359-9400 or toll-free at (800) 261-5707 or via email at hzeyghami@cwengineers.com.

Sincerely,
CWE, Inc.

Hooshang Zeyghami, M.S., P.E., BCEE
Chief Engineer

Enclosure – *Plan Modification Identification and Characterization of a Proposed Clay Borrow Site for the Vernon County Sanitary Balefill*
One Set of Plan Sheets 11" X 17"

cc: Mr. Gene Edwards, Solid Waste Manager, Vernon County Landfill, Box 247-B, Route 3, Viroqua, WI 54665
Mr. Martin Herrick, WDNR, LaCrosse

PLAN MODIFICATION

IDENTIFICATION AND CHARACTERIZATION

OF A PROPOSED CLAY BORROW SITE

for the

VERNON COUNTY SANITARY BALEFILL
License # 03268

CWE PROJECT # 946-11000

April 2011

COPY

CWE, Inc.

general@cwengineers.com
www.cwengineers.com

5707 Schofield Avenue
Weston, WI 54476-0107
Phone: (715) 359-9400
Fax: (715) 355-4199

106 North Main Street
Viroqua, WI 54665
Phone: (608) 637-2932
Fax: (608) 637-3602

PLAN MODIFICATION

IDENTIFICATION AND CHARACTERIZATION

OF A PROPOSED CLAY BORROW SITE

for the

VERNON COUNTY SANITARY BALEFILL
License # 03268

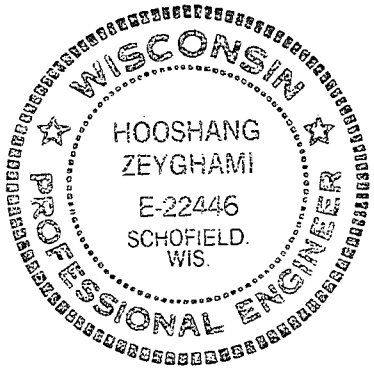
CWE PROJECT # 946-11000

April 2011

Prepared By:

Central Wisconsin Engineers, Inc.
5707 Schofield Avenue
Weston, WI 54476
Phone (715) 359-9400
Fax (715) 355-4199

I, Hooshang Zeyghami, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.



Hooshang Zeyghami, M.S., P.E., BCEE
Chief Engineer

I, David L. Ozsvath, hereby certify that I am a registered professional geologist in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 10, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.



David L. Ozsvath, Ph.D., P.G.

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Figure 4 WDNR Map of Seas Branch Earthen Dam
Figure 5 USGS Topographic Map

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Existing Conditions Map Sheet 3 of 10
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1.0 GENERAL SITE INFORMATION

1.1 Purpose

The purpose of this report is to present the results of a field investigation that was undertaken to characterize a clay source for use in constructing the Vernon County Balefill Vertical Expansion. The format of the report follows NR 512.15, Wis. Adm. Code, which describes the requirements for the identification and characterization of borrow sources as part of a landfill feasibility study.

1.2 Project History

Vernon County opened a sanitary balefill in 1993 and then a construction and demolition (C&D) waste landfill in 1995 to serve the solid waste disposal needs of its residents. The C&D waste landfill reached capacity in September of 2005, since which time C&D waste has been placed in the sanitary balefill. Vernon County received a favorable feasibility determination for the construction of a vertical expansion to its existing balefill in June 2004, and conditional approval for the plan of operation was received in August 2005.

Although construction of the vertical expansion should increase the need for acceptable clay by less than two percent of what had been projected for the original balefill design, the existing clay borrow source (also located on the balefill property) appears to contain less clay than had been estimated when the balefill was approved. Therefore, to insure that an adequate volume of clay is available, a clay search expanded into an adjacent area of the property.

1.3 Owner and Operator

This facility is owned by Vernon County and operated by the Vernon County Solid Waste Department.

Contact: Mr. Gene Edwards, Solid Waste Manager
S3705 County Road LF
Viroqua, WI 54665
Phone: (608) 634-2900
Email: gedwards@vernoncounty.org

1.4 Engineering Consultant

Central Wisconsin Engineers, Inc.
5707 Schofield Avenue
Weston, WI 54476

Contact: Mr. Hooshang Zeyghami, M.S., P.E., BCEE
Phone: (715) 359-9400
E-mail: hzeyghami@cwengineers.com

2.0 LOCATIONAL INFORMATION

2.1 Site Location

The proposed clay borrow source is located on the same property as the Vernon County Sanitary Balefill (see Figure 1 Land Atlas/Plat Map in Appendix A for the locations of the balefill and the proposed borrow site). The portion of the property under consideration is situated to the southwest of the existing balefill along the balefill entrance road from CTH LF and encompasses roughly 11 acres (see Plan Sheets 1 and 2 of 10 for site location maps). The legal description for this proposed borrow site is as follows:

> The E ½ of the NW ¼ of the NW ¼ all in Section 22 of Township 13 North, Range 4 West, in the Town of Viroqua, Vernon County, Wisconsin.

2.2 Initial Site Inspection

In a letter dated September 3, 2009 to Mr. Martin Herrick, WDNR Project Engineer, CWE, Inc., on behalf of Vernon County, requested that the Department conduct an initial site inspection of the proposed clay borrow site. Mr. Herrick, accompanied by Mr. Gene Edwards, Solid Waste Manager, performed an inspection of the proposed borrow site on October 15, 2009.

Mr. Herrick rendered the site suitable and compliant with the locational requirements of ch. NR 504.04 Wis. Adm. Code in a letter to Mr. Gene Edwards, dated May 28, 2010. Copies of these letters and other regulatory correspondence pertaining to the proposed clay borrow site, are included in Appendix B.

2.3 Present Land Use

The proposed clay borrow site occurs within a 253-acre, irregularly shaped parcel that is owned by Vernon County and used for solid waste disposal. Land use within one mile of this property is primarily agricultural, either as crop land or pasture (see Figures 2 and 3 in Appendix A for aerial maps obtained from the Wisconsin Department of Natural Resources website.) However, sloping land to the northeast is wooded and used for timber and private hunting. The Vernon County Solid Waste Management Plan (2002) indicates that there are no scientific or natural areas, State parks, or County forest lands within several miles of the property under consideration.

2.4 Transportation Routes

Because the proposed borrow source is located on the same property as the balefill, the hauling of clay to the balefill would not require the use of public roads as transportation routes (see Plan Sheet 2).

2.5 Access Restrictions

Because the borrow source would be located on the same property as the balefill, there are no access restrictions to obtaining the clay.

2.6 Hydrologic Features

The proposed clay borrow source is situated near the top of a ridge that separates Seas Branch from an intermittent tributary to that permanent stream. Consequently, there are no permanent surface water features at the site. The natural topography directs runoff to the east towards the intermittent tributary to Seas Branch. Ultimately, runoff from the site enters Seas Branch, which is impounded by an earthen dam located roughly one mile northeast of the site (see Figure 4 in Appendix A for the WDNR Map of the Seas Branch Earthen Dam location, and Figure 5 for a USGS topographic map of this area).

Seas Branch valley also contains areas of wetlands and wetland indicator soils, some of which occur within one-half mile of the proposed site (see Figure 3 in Appendix A for the WDNR Wetland Indicator Map). The excavation of clay at the project site is not expected to have any effect on these wetlands.

Based on water level measurements from monitoring wells near the sanitary balefill, it appears that the water table occurs roughly 100 to 130 feet below the lowest elevation at the proposed borrow site in the southeast corner. Groundwater flows generally to the north-northeast within the Prairie du Chien dolomite and underlying sandstones.

Monitoring wells near the balefill also encountered a shallower "perched" water table that occurs where vertical groundwater movement is inhibited by lowly permeable shale beds within the Prairie du Chien bedrock. Springs and seeps are produced where these shale beds intersect the land surface, such as along the hillsides of Seas Branch valley. If the perched water table extends beneath the proposed clay borrow site, it occurs less than 100 feet below the land surface.

2.7 Natural or Historical Areas

On July 15, 2005, the WDNR Archaeologist provided cultural resource clearance for the proposed clay borrow site. The letter indicated that the borrow site would not impact any known archaeological sites or historic structures in the project area (see Appendix B).

On May 1, 2002, an approved Endangered Resources Review letter (Log #02-051) was issued by the WDNR Bureau of Endangered Resources for the vertical expansion of the existing sanitary solid waste landfill (see Appendix B for correspondence).

In accordance with recent correspondence with the Bureau of Endangered Resources, CWE prepared and submitted a current review request form (Form 1700-047 Revised 2/11) for the proposed clay borrow site. The response from the Bureau of Endangered Resources is pending (see Appendix B for copies of the regulatory correspondence and the endangered resources review request form with associated attachments).

3.0 FIELD AND LAB INVESTIGATIONS

3.1 Test Pits

A qualified representative of CWE inspected the excavation of 15 test pits within the proposed clay borrow source area on December 3, 2004 (see Plan Sheet 3 of 10 for test pit locations). This area encompasses approximately 18 acres, which requires a minimum of 15 test pits to satisfy the requirements of s. NR 512.15(2)(a).

The depth of the test pit excavations varied between 2.5 and 9.5 feet, with most pits extending to 8 or 9 feet below land surface (see Appendix C for test pit logs). Each major soil unit encountered in these pits was described based on field observations and results of analyzing selected samples in the laboratory.

3.2 Soil Samples

In accordance with s. NR 512.15(2)(b), two representative samples from each pit were analyzed for grain size distributions and Atterberg limits (a total of 31 samples). Three soil samples (each from a different pit) were also submitted for five-point modified Proctor tests and for falling-head permeability tests. A summary of the results from all of the laboratory analyses conducted on test pit soil samples is contained in Appendix D.

3.3 Results of Investigation

The geologic materials encountered in the 15 test pits are the same as what was found in other onsite locations during the feasibility studies for the balefill and its vertical expansion. The upper 10 feet of subsurface material exposed in the test pits, includes loess (wind blown deposits of silt and clay) and residuum (ranging from silty clay to clayey sand) that is derived from weathering of the underlying bedrock. Although these fine-grained materials have different geologic origins, each includes clay-rich horizons which meet the requirements for landfill liners as defined in the Wisconsin Administrative Code.

Appendix D contains a table that summarizes the results of all laboratory analyses conducted on soil samples. This table shows that all but one sample (S-3 fromTP-3) had more than 50 percent of its grain sizes by weight pass through the 200 sieve (the average P-200 for all samples is 91). Thus, 30 of the samples meet the requirement for clay used in landfill liners that is specified in s. NR 504.06(2)(a)1. The sample that did not meet this standard was collected from the bottom of TP-3, beneath a layer of acceptable clay material.

The results of the Atterberg limits tests showed that all 30 samples with greater than 50 percent passing the 200 sieve also had liquid limits of greater than 25 percent (the average value is 42.0 percent), and none of the liquid limits are less than 20 percent. This satisfies the requirement of s. NR 504.06(2)(a)3. for clay used in landfill liners.

The 30 samples that meet the requirements for clay in both s. NR 504.06(2)(a)1. and 3. have an average plasticity index of 19.2 percent, which meets the requirement of greater than 12 percent specified in s. NR 504.06 (2) (a) 4. However, seven of these samples

have a plasticity index of less than 10 percent and thus do not meet the standard for clay used in landfill liners. Three of these seven samples (S-2 from TP-4, S-2 from TP-5, and S-2 from TP-9) were collected at the bottom of a test pit, beneath the layer of acceptable clay material. Two of the samples came from a single pit (TP-14), suggesting that none of the material at this location is acceptable for use as clay in a liner. The remaining two samples (S-1 from TP-8 and S-1 from TP-15) are shallow samples collected from above acceptable clay material.

Three samples were submitted for Proctor tests (ASTM D1557-78, Method A). The tests showed maximum dry densities between 104 and 113 lbs/ft^3 (an average of 109 lbs/ft^3) and optimum moisture contents between 14 and 19 percent (average of 16.5 percent). Falling-head permeability tests conducted on these samples yielded saturated hydraulic conductivity values between 1.08×10^{-8} and 9.12×10^{-8} cm/sec. All of these results exceed the minimum requirements for clay liner material as specified in s. NR 504.06 (2) (a) 2. Copies of the laboratory reports for the water content, grain size analysis, Proctor tests, permeability, and Atterberg limits are included in Appendices E through I, respectively.

3.4 Clay Isopach Map

Plan Sheet 4 of 10 is an isopach map of clay that meets all of the requirements for landfill liner material as specified in s. NR 504.06(2). To create this map, the thickness of acceptable clay material at each test pit was estimated based on its log and the results of laboratory analyses. In all cases, the uppermost foot of soil is assumed to be topsoil that does not meet the minimum requirements for clay used in landfill liners. There are various ways to interpolate the clay thicknesses between test pits; and the isopach map on Plan Sheet 4 is one of the simpler interpretations. Plan Sheets 9 and 10 show the variations in clay thickness along four cross sections drawn through the site.

3.5 Volume Calculations

Based on the isopach map shown in Plan Sheet 4, it appears that at least 69,750 cubic yards of acceptable clay is available from this borrow source. This estimate is based on the mapped variation in clay thickness (which ranges from 0 to 7 feet thick) and the area from which clay will be extracted (roughly 10.6 acres). However, the actual volume of clay that is extracted will depend on the conditions encountered during excavation. Clay will only be taken from areas where its thickness is greater than two feet, and the precise areal extent of clay meeting that requirement will not be known until excavation begins.

Future activities at the sanitary balefill that will require clay material include construction of the remaining liner, placement of intermediate cover, and placement of the final cover system during closure, as described in the approved Plan of Operation for this facility. To complete this work, an estimated 55,000 cubic yards of clay meeting the requirements of ch. NR 504 will be needed. The volume of clay available from the proposed borrow site exceeds this projected need by nearly 15,000 cubic yards and should therefore be more than sufficient for all future construction activities.

4.0 SITE DEVELOPMENT, OPERATION, AND CLOSURE

4.1 Clay Separation Methods

Because the thickness of clay at the proposed borrow site ranges from less than two to greater than five feet thick, a methodology for separating acceptable from unacceptable soil material is required by s. NR 504.075(11). Whenever soil is excavated at the site, a qualified technician from CWE will be present to supervise the process. The decision to accept or reject excavated soil will be made based on his/her visual inspection; however, soil samples will also be collected periodically for laboratory analyses to provide quality control on the technician's judgment. This procedure has already been used to separate acceptable from unacceptable soil material at another borrow site on the Vernon County Sanitary Balefill property when clay was excavated to construct the existing balefill liner.

4.2 Clay Extraction and Hauling

The extraction of clay from the proposed borrow site will be completed in approximately four different phases, each of which will coinicide with the future construction needs at the balefill. In an effort to keeps costs in check, the clay will be excavated and transported directly as needed during construction activities. Clay from the borrow site is not expected to be stockpiled.

4.3 Drainage and Sediment Control

Sediment erosion prevention and surface water drainage control will be implemented as appropriate in accordance with best managed practices. To control storm water runoff and prevent sediment from reaching surface water bodies, a storm water management plan will be implemented to meet the applicable requirements of NR 504.09. This will be accomplished through a combination of phased excavation and the use of sedimentation basins and drainage swales to prevent sediments from leaving the site.

Clay excavation will commence in the topographically high northwest corner of the site (see Plan Sheet 5) and proceed towards the southwest. This will insure that excavation receives only the water from direct precipitation and not the runoff from adjacent areas. With the excavation being conducted in multiple phases, the limited duration and extent of the clay removal will limit opportunities for significant runoff to occur. However, other measures, such as silt fences, and tracking pads will be used as needed. The final site topography will generally slope to the southwest with localized depressions between the phases of excavation to trap runoff. Erosion control practices are shown on Sheets 5 and 6. The geologic cross sections are depicted in Plan Sheets 8-10.

Best management practices will be implemented throughout the duration of clay mining operations. In general, these practices will include:

- Installing silt fence on the down-slope side of the mining area
- Installing a permanent sedimentation basin at the down-slope base of the mine area
- Installing a vehicle tracking pad at the entrance/exit of the mined area
- Inspecting the mined area at least once a week and after every significant rainfall to assess the status of the erosion and sedimentation control practices.

4.4 Reclamation Plan

A Vernon County Nonmetallic Mine Reclamation Application Permit will be completed and submitted for approval if it is deemed necessary. All applicable local, state, county, and federal permits will also be obtained prior to the initiation of clay mining. Plan Sheet 6 shows the proposed final grades for the borrow source area after the required clay has been excavated.

Each phase of construction will be reclaimed to final grades and cover at the end of each excavation. Reclamation activities will include:

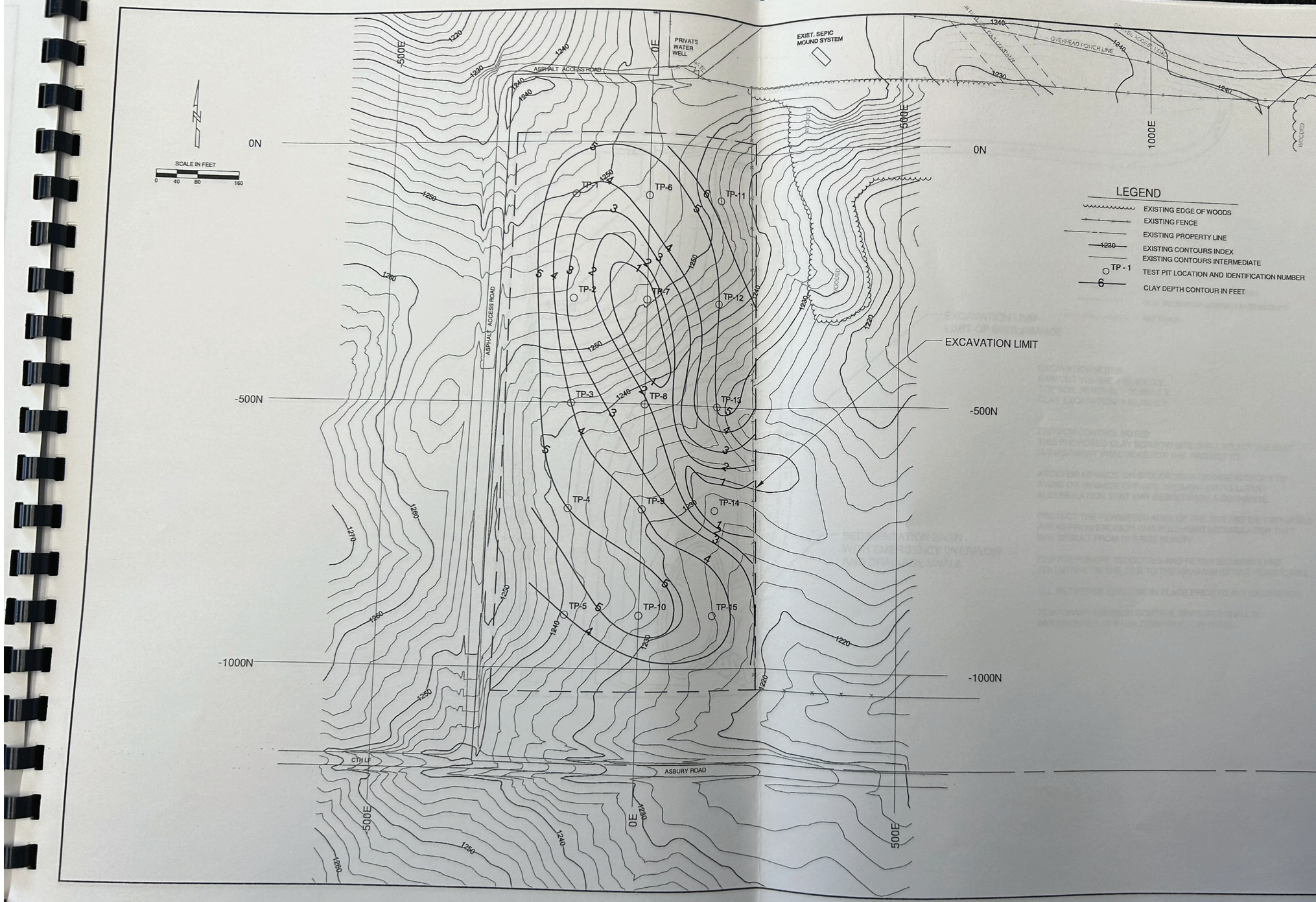
- Grading the limits of the mine area to slopes typically around 4:1 (horizontal to vertical measures), but not steeper than 3:1
- Grading the base of the mined area to slopes that vary from 1% to 6%.
- Restoring the topsoil previously removed in an even thickness across the entire mined area
- Seeding, mulching, and fertilizing to vegetate the mined area with native forbs and grasses
- Cleaning and maintaining the sedimentation basin at the end of each construction phase to assure continued functionality
- Maintaining the silt fence at least until the disturbed area is revegetated
- Removing the tracking pad when the final reclamation activities are complete.

To minimize erosion, all existing vegetation will be left intact wherever feasible. After the final grades are achieved at the end of a construction season, the topsoil will be seeded for permanent erosion control. Seeding efforts may include both mulch and/or fertilizer, where appropriate. Erosion mats will be used to hold seed and mulch on steep surfaces and to reduce wind removal of loose mulch. New slopes will be monitored the following spring to insure that an adequate vegetative cover has developed.

5.0 CONCLUSION

CWE has conducted an investigation of soil material at the proposed borrow site. Based on our evaluation of the laboratory test results generated by this investigation, it appears that there are roughly 70,000 cubic yards of material at the site which meet the minimum requirements for clay used in a landfill liner. Because the proposed borrow site is located on the same property as the solid waste disposal facility where the clay will be used (the Vernon County Sanitary Balefill), disturbances caused by excavation and hauling will be minimized. The post-excavation reclamation plan proposes that the borrow site become a high quality wet meadow and upland meadow natural area. In light of these facts and findings, CWE recommends that the proposed site be approved as an acceptable source of clay for use in the construction of a sanitary landfill.

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CWE, Inc.
5707 SCHOFIELD AVE.
WESTON, WISCONSIN
54476
PHONE: (715) 359-9400
FAX: (715) 355-4199
general@cwengineers.com
www.cwengineers.com

PROJECT:

CLAY ISOPACH MAP
VERNON COUNTY SANITARY BALEFILL
CLAY BORROW SITE
PLAN MODIFICATION

REVISIONS:

PROJECT NO: 94602000
DRAWN BY: D.H.
CHECKED BY: S.T.
APPROVED BY: H.Z.
DATE: 04/11

SHEET: 4 OF 10

APPENDIX A

FIGURES

- Figure 1 — Site Location Map - Land Atlas/Plat Map
- Figure 2 — WDNR Aerial Project Location Map
- Figure 3 — WDNR Aerial and Wetland Indicator Map
- Figure 4 — WDNR Map of Seas Branch Earthen Dam
- Figure 5 — USGS Topographic Map

CWE, Inc.
5707 SCHOFIELD AVE.
WESTON, WISCONSIN
54476
PHONE:(715)359-9400
FAX:(715)355-4199
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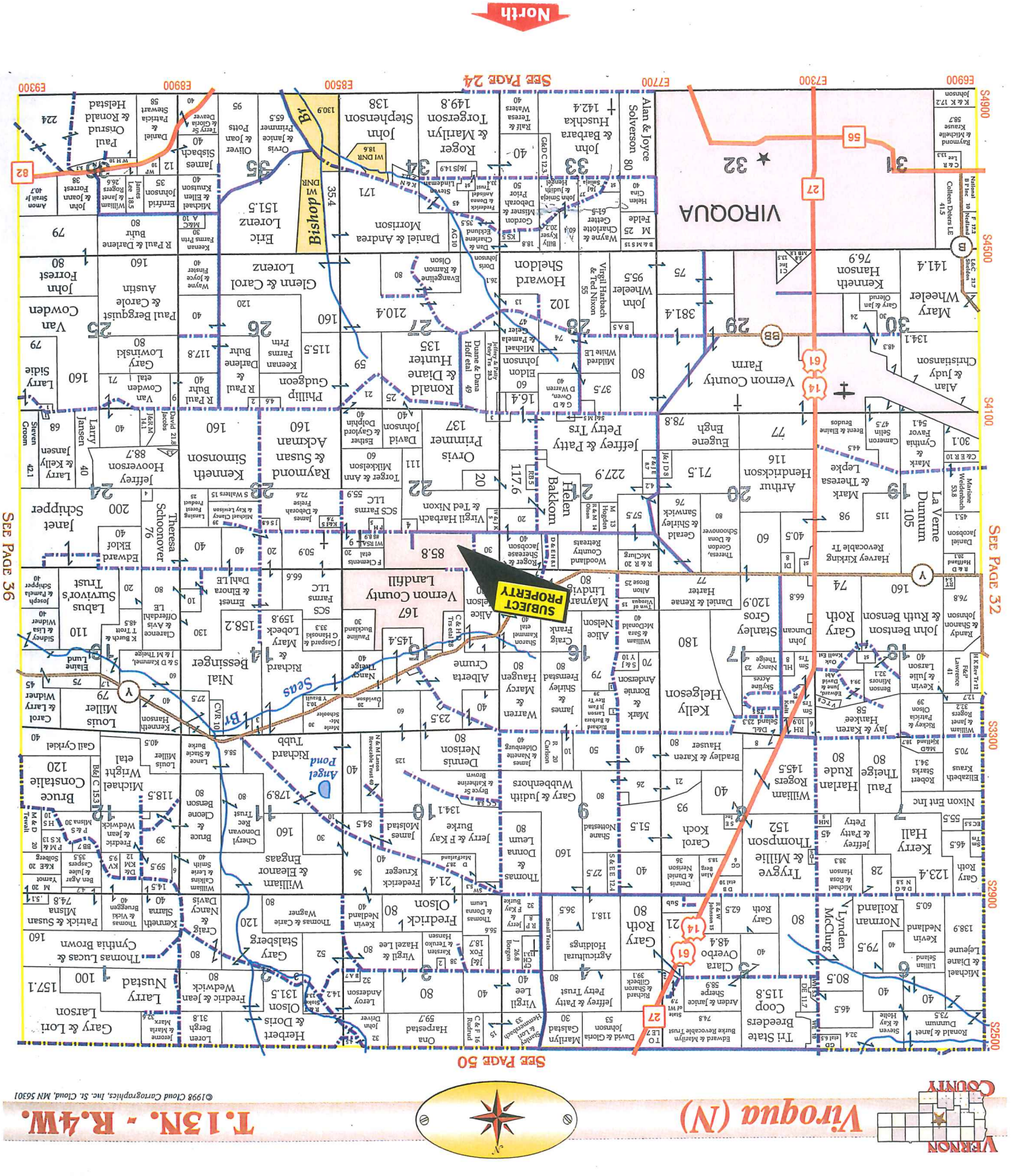
PROJECT:

SITE LOCATION MAP
PROPOSED CLAY BORROW SITE
VERNON COUNTY, WI

CWE Project No.:
9461000

SOURCE: VERNON COUNTY LAND ATLAS/PLAT BOOK

FIGURE 1



Map Created on Apr 04, 2011





Legend

Major Highways
- Interstate
- State Highway
- U.S. Highways

County Roads

Local Roads

24K County Boundaries

Civil Towns
- Civil Town

USDA Wetspots

DNR Wetland Points
- Excavated Pond
- Dammed Pond
- Wetland Too Small to Delineate
- Filled Excavated Pond
- Filled Dammed Pond
- Filled Wetland Too Small to Delineate
- Filled or Drained Wetland

DNR Wetland Areas
- Upland
- Wetland
- Filled or Drained Wetland

Wetland Indicator Soils

24K Open Water

24K Rivers and Shorelines
- Intermittent
- Fluctuating
- Perennial

0 — 750 — 1500 — 2250 ft.

Map created on Apr 4, 2011

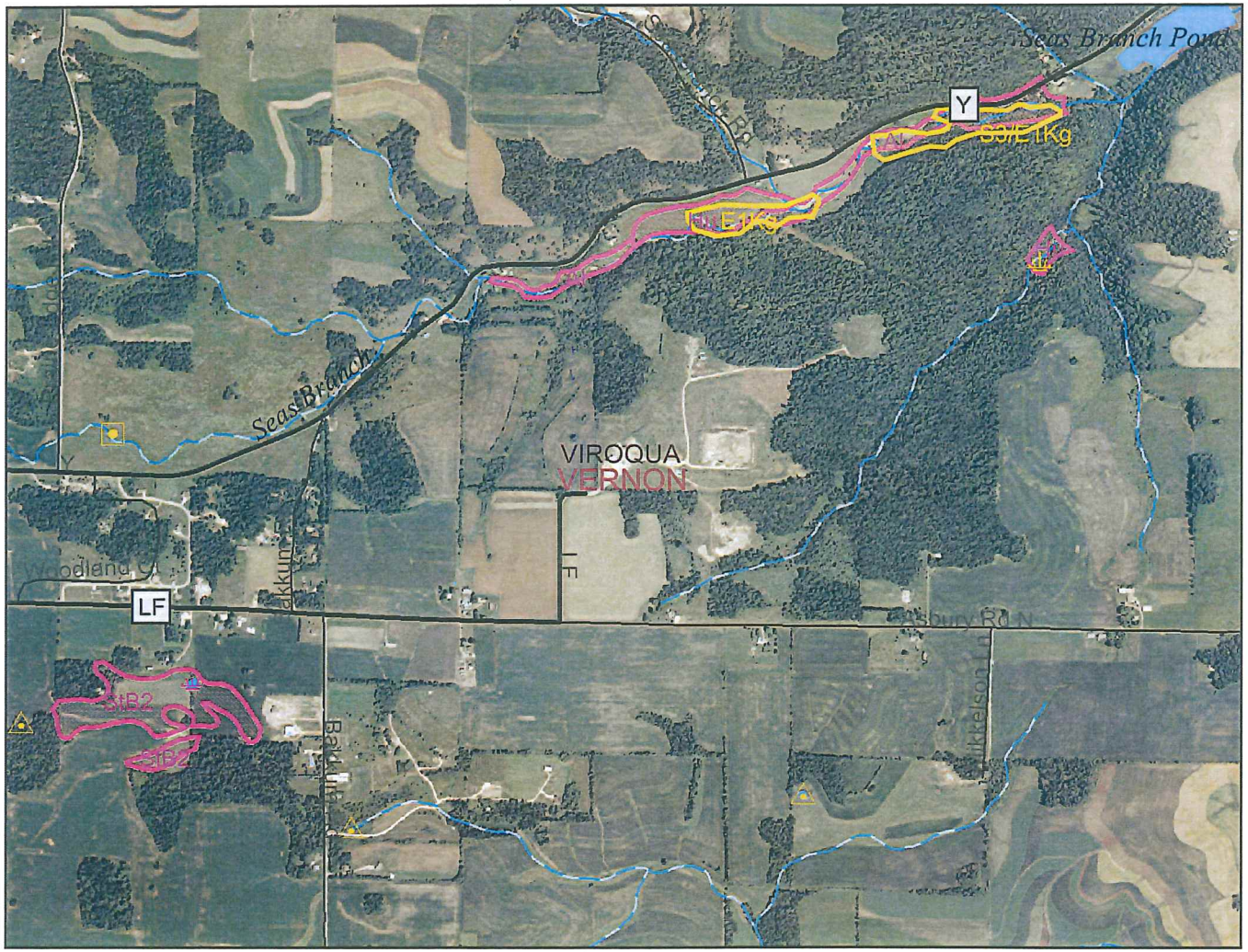
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Wisconsin Wetland Inventory (WWI) maps show graphic representations of the type, size and location of wetlands in Wisconsin. These maps have been prepared from the analysis of high altitude imagery in conjunction with soil surveys, topographic maps, previous wetland inventories and field work. State statutes define a wetland as "an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions." The principal focus of the WWI is to produce wetland maps that are graphic representations of the type, size and location of wetlands in Wisconsin. Within this context, the objective of the WWI is to produce reconnaissance level information on the location, type, size of these habitats such that they are accurate at the nominal scale of the 1:24,000 (1 inch = 2000 feet) base map. The DNR recognizes the limitations of using remotely sensed information as the primary data source. They are to be used as a guide for planning purposes. There is no attempt, in either the design or products of this inventory, to define the limits of jurisdiction of any Federal, State, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State, or local agencies concerning specified agency regulatory programs and jurisdictions that may affect such activities. The most accurate method of determining the legal extent of a wetland for federal or state regulations is a field delineation of the wetland boundary by a professional trained in wetland delineation techniques.

Figure 2 – Clay Borrow Site - WDNR Aerial Project Location Map

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Map Created on Apr 04, 2011





Legend

Major Highways
- Interstate
- State Highway
- U.S. Highways

County Roads

Local Roads

24K County Boundaries

Civil Towns
- Civil Town

USDA Wetspots

DNR Wetland Points
- Excavated Pond
- Dammed Pond
- Wetland Too Small to Delineate
- Filled Excavated Pond
- Filled Dammed Pond
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- Filled or Drained Wetland

DNR Wetland Areas
- Upland
- Wetland
- Filled or Drained Wetland

Wetland Indicator Soils

24K Open Water

24K Rivers and Shorelines
- Intermittent
- Fluctuating
- Perennial

0 2000 4000 6000 ft.

Scale: 1:19,959

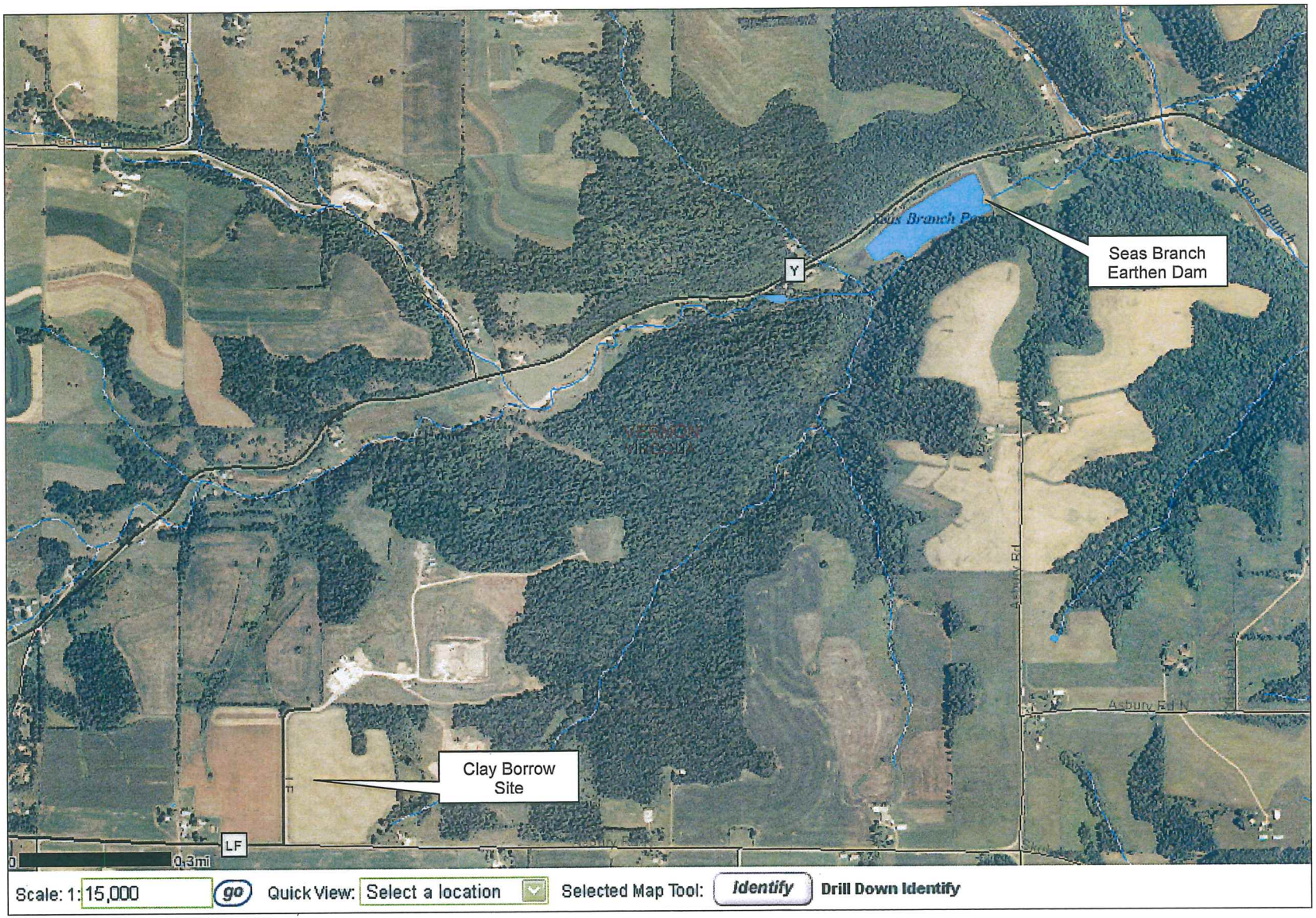
Map created on Apr 4, 2011

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Figure 3 – Clay Borrow Site – WDNR Aerial Vicinity and Wetland Locator Map

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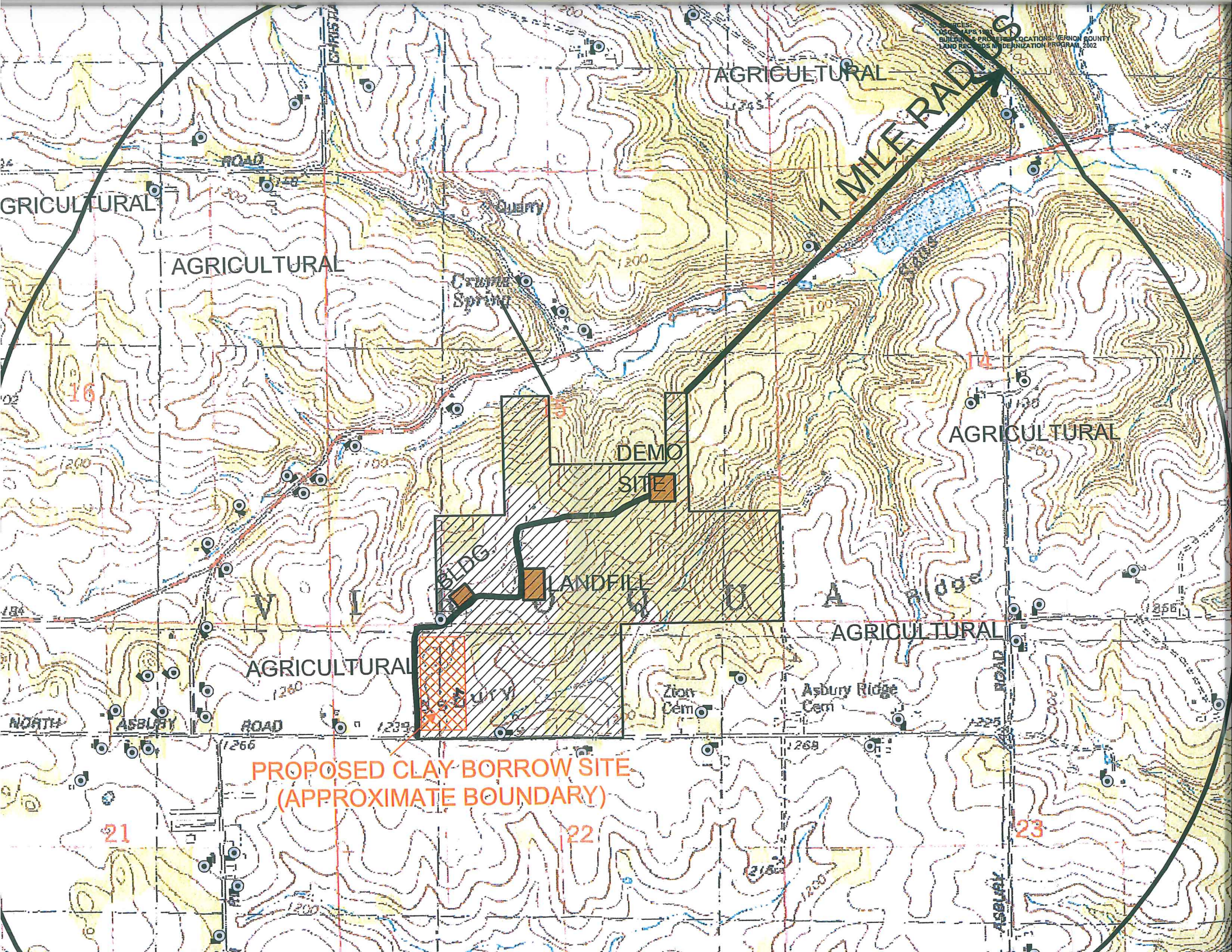
WDNR Map of Seas Branch Earthen Dam



North

Figure 4
Vernon County Landfill - Clay Borrow Site
WDNR Map of Seas Branch Earthen Dam

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1 MILE RADIUS
AGRICULTURAL
AGRICULTURAL
AGRICULTURAL
AGRICULTURAL
AGRICULTURAL
Quarry
Crumb Spring
DEMO SITE
BLDG
LANDFILL
PROPOSED CLAY BORROW SITE
(APPROXIMATE BOUNDARY)
Zion Cem
Asbury Ridge Cem
NORTH ASBURY ROAD
ASBURY ROAD
16
14
21
22
23

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APPENDIX B

REGULATORY CORRESPONDENCE

Section B-1 Archaeological/Historical Correspondence

March 25, 2002
Letter from Victoria Dirst, DNR Archeologist
To Mr. Daryl R. Peterson/CWE
Re: No Further Review Needed for Compliance with Historic Preservation Statutes
For Vernon County Landfill Vertical Expansion Project

May 1, 2002
Letter from Jennifer Bardeen, WDNR Bureau of Endangered Resources
To Mr. Daryl Peterson/CWE
Re: No Further Surveys Needed for Endangered Resources Approval for Vernon CountyLandfill Vertical Expansion Project

July 12, 2005
Letter from Peter Arntsen/CWE
To Ms. Jennifer Bardeen, WDNR Bureau of Endangered Resources
Re: Request for Endangered Resources Review

July 13, 2005
Letter from Peter Arntsen/CWE
To Ms. Victoria Dirst, DNR Archeologist
Re: Request for Archeologicial and Historical Sites Review

July 15, 2005
Letter from Victoria Dirst, DNR Archeologist
To Mr. Peter Arntsen/CWE
Re: Cultural Resource Clearance for Archeological and Historical Sites

April 7, 2011
Email from Lori Steckervetz, WDNR Bureau of Endangered Resources
To Ms. Cindy Zelenka/CWE
Re: Updated Project Review Request Needed for Site Using Current Form

April 14, 2011
Letter from Cindy Zelenka/CWE (and Permit)
To Ms. Lori Steckervetz, WDNR Endangered Resources
Re: Request for WDNR Endangered Resources Approval for Clay Borrow Site

946-00-000

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Archaeology Office
952 Tacoma Beach Rd.
Sturgeon Bay, WI 54235
Telephone: 920-743-2083

Scott McCallum, Governor
Darrell Bazzell, Secretary

FILE COPY

RECEIVED
MAR 26 2002
DP HZ DO File

March 25, 2002

Daryl R. Peterson
Central Wis. Eng. & Architects
5707 Schofield Avenue
Weston, WI 54476-0107

SUBJECT: Vernon County Sanitary Landfill, WDNR License #03268

Dear Mr. Peterson:

I have reviewed the proposal for the vertical expansion of the Vernon County Sanitary Landfill (T13N, R4W, sec. 15), and I have determined that there are no known archaeological sites or historic structures in the project area. No further review is needed for compliance with state historic preservation statutes.

Sincerely,

Victoria Dirst

Victoria Dirst, Ph.D.
DNR Archaeologist

24

WISCONSIN
DEPT. OF NATURAL RESOURCES

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Scott McCallum, Governor
Darrell Bazzell, Secretary

101 S. Webster St.
Box 7921
Madison, Wisconsin 53707-7921
Telephone 608-266-2621
FAX 608-267-3579
TTY 608-267-6897

May 1, 2002

Mr. Daryl Peterson P.E.
Central Wisconsin Engineers and Architects Inc.
5707 Schofield Avenue
Weston, WI 54476

SUBJECT: Endangered Resources Review (Log # 02-051)
Vertical Expansion of Existing Sanitary Solid Waste Landfill

Dear Mr. Peterson:

The Bureau of Endangered Resources has reviewed the project area described in your letter of March 4, 2002 for the proposed vertical expansion of an existing sanitary landfill in Vernon County.

Our Natural Heritage Inventory (NHI) data files contain no occurrence records of Endangered, Threatened, or Special Concern species, natural communities, or State Natural Areas that we believe would be impacted by the project as currently proposed, nor for the actual project areas in T13N R4W, Section 15 Vernon County.

Although there are no records in the NHI database of endangered resources occurring at the project site, comprehensive endangered resource surveys have not been completed for the project area. As a result, our data files may be incomplete. Given your description of the project site and the nature of the proposed project we do not believe that further surveys are warranted.

This letter is for informational purposes and solely addresses endangered resource issues. This letter does not constitute Department of Natural Resources authorization of the proposed project and does not exempt the project from securing necessary permits and approvals from the Department.

Please contact me at (608) 266-8736 if you have any questions about this information.

Sincerely,

Jennifer Bardeen

Jennifer Bardeen
Bureau of Endangered Resources

CC: Jim Doperalski-WCR-LaCrosse
Martin Herrick-WCR-LaCrosse

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MAY - 8 2002
DP HZ File

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CWEA CENTRAL WISCONSIN ENGINEERS ARCHITECTS

Enginee · Architects · Scienti s · Surveyors

5707 Schofield Avenue
P.O. Box 107
Weston, WI 54476-0107
www.cwengineers.com

Tel 715.359.9400
Fax 715.355.4199
Toll-free 800.261.5707
general@cwengineers.com

July 12, 2005

Ms. Jennifer Bardeen
Bureau of Endangered Resources
Department of Natural Resources
101 South Webster Street
P.O. Box 7921
Madison, WI 53707-7921

Re: **Proposed Clay Borrow Site**
Vernon County Balefill, License No. 03268
CWEA Project No. 94602000

Subject: Endangered Resources Review

Dear Ms. Bardeeen:

Vernon County intends to construct a vertical expansion to its sanitary balefill once the plan of operation for this expansion is approved. To insure that a sufficient volume of clay is available for construction, the County desires to use an undeveloped portion of its balefill property as a clay borrow site (a map showing the proposed borrow site location is included with this letter). This land has most recently been used as an agricultural field.

On behalf of the County, Central Wisconsin Engineers & Architects, Inc. is submitting a request for a review and identification of any critical habitat areas and state or local natural areas within one mile of this proposed borrow site, in accordance with s. NR 512.15 (1), Wis. Adm. Code. The property is located in T13N, R4W, Section 22, Town of Viroqua, Vernon County.

I appreciate your efforts in assisting us in this project. If you have any questions, please contact me at 715-359-9400.

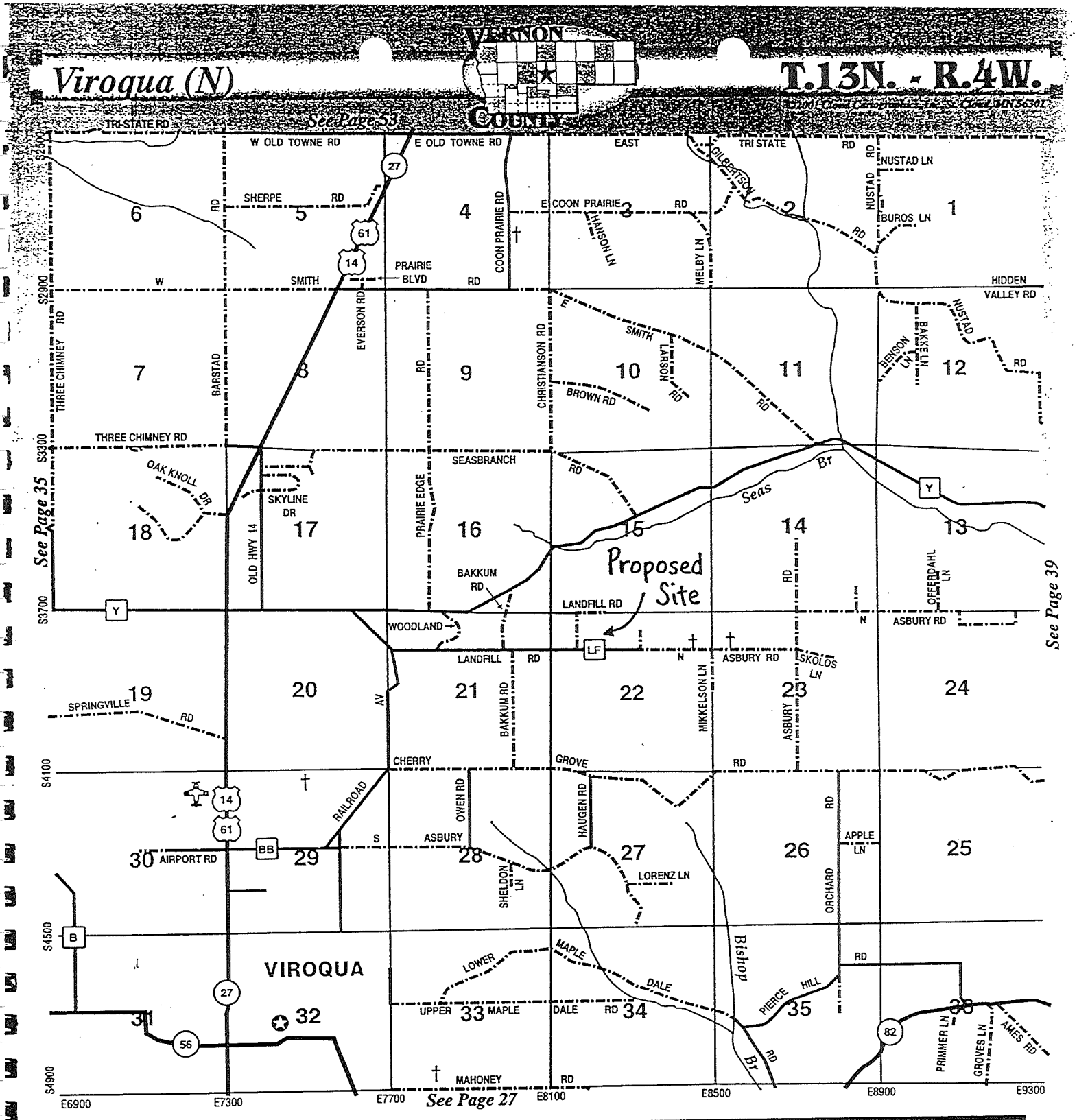
Sincerely,
Central Wisconsin Engineers & Architects, Inc.

Peter D. Arntsen, M.S., P.H.
Hydrogeologist

Enclosures

cc: Mr. Gail Frie, Box 247-B, Route 3, Viroqua

I:\LB\94602000\Corres\Endangered Resources.doc



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What ever your telecommunications needs are, let us assist you.
114 E Court St., Viroqua WI
Phone: 608/637-2111

CENTRAL WISCONSIN ENGINEERS ARCHITECTS

Engineers · Architects · Scientists · Surveyors

5707 Schofield Avenue
P.O. Box 107
Weston, WI 54476-0107
www.cwengineers.com

Tel 715.359.9400
Fax 715.355.4199
Toll-free 800.261.5707
general@cwengineers.com

July 13, 2005

Ms. Victoria Dirst, Ph.D.
DNR Archaeologist
Department of Natural Resources
Archaeology Office
952 Tacoma Beach Road
Sturgeon Bay, WI 54235

Re: **Proposed Clay Borrow Site**
Vernon County Balefill, License No. 03268
CWEA Project No. 94602000

Subject: Archaeological and Historical Sites Review

Dear Ms. ~~Bardeeen~~ Dirst:

Vernon County intends to construct a vertical expansion to its sanitary balefill once the plan of operation for this expansion is approved. To insure that a sufficient volume of clay is available for construction, the County desires to use an undeveloped portion of its balefill property as a clay borrow site (a map showing the proposed borrow site location is included with this letter). This land has most recently been used as an agricultural field.

On behalf of the County, Central Wisconsin Engineers & Architects, Inc. is submitting a request for a review and identification of any historical or archaeological areas within the vicinity of this proposed borrow site, in accordance with s. NR 512.15 (1), Wis. Adm. Code. The property is located in T13N, R4W, Section 22, Town of Viroqua, Vernon County.

I appreciate your efforts in assisting us in this project. If you have any questions, please contact me at 715-359-9400.

Sincerely,
Central Wisconsin Engineers & Architects, Inc.

Peter D. Arntsen, M.S., P.H.
Hydrogeologist

Enclosures

cc: Mr. Gail Frie, Box 247-B, Route 3, Viroqua

I:\LB\94602000\Corres\Archaeological Sites.doc

94607000, Vernon Co LF

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Archaeology Office
952 Tacoma Beach Rd.
Sturgeon Bay, WI 54235
Telephone: 920-743-2083

Jim Doyle, Governor
Scott Hassett, Secretary

RECEIVED
JUL 18 2005

July 15, 2005

Peter D. Arntsen
Central Wisconsin Engineers & Architects
5707 Schofield Ave., Box 107
Weston, WI 54476-0107

SUBJECT: Clay Borrow Site for Vernon County Balefill

Dear Mr. Arntsen:

I have reviewed Wisconsin Historical Society files and have determined that the proposed clay borrow site for the Vernon County Balefill will not impact any known archaeological sites or historic structures. This project, located in T13N, R4W, section 22, has cultural resource clearance.

Sincerely,

Victoria Dirst

Victoria Dirst, Ph.D.
DNR Archaeologist

Cindy Zelenka

From: Cindy Zelenka [czelenka@cwengineers.com]
Sent: Thursday, April 07, 2011 3:31 PM
To: 'Steckervetz, Lori L - DNR'
Subject: RE: Clay Borrow Site for Vernon Co. Landfill

Hi Lori –
Thank you so much for your prompt response in this matter – it is greatly appreciated!!
Have a great day! ☺

Cindy L. Zelenka
Environmental Specialist
CWE, Inc.
5707 Schofield Avenue
PO Box 107
Weston, WI 54476-0107
Phone: (715) 359-9400
Toll Free: (800) 261-5707
Fax: (715) 355-4199
Email: czelenka@cwengineers.com

From: Steckervetz, Lori L - DNR [mailto:Lori.Steckervetz@Wisconsin.gov]
Sent: Thursday, April 07, 2011 3:01 PM
To: Cindy Zelenka
Subject: RE: Clay Borrow Site for Vernon Co. Landfill

Hi Cindy,

So, I never found an actual record or response letter to the 2005 review request. I am going to make the assumption that it was decided at the time to use the same response in the 2002 letter, though I would still expect there to be a record of that. In moving forward, I would recommend that for a future project that a new review should be conducted, as our data collection on E/T species has vastly improved and increased in the nine years since this last letter was issued and as such there may be different recommendations made for a project. I've attached the pdf of our new ER Review request form. You can send it back to me directly, just make sure it is signed on the back, as well as any maps/aerial photos related to the project.

Thanks!

Lori

Lori Steckervetz, ER Review Assistant
Wisconsin Department of Natural Resources
Bureau of Endangered Resources
101 S. Webster St. PO Box 7921
Madison, WI 53707-7921
Phone: 608-264-6057
Fax: 608-266-2925
Email: lori.steckervetz@wisconsin.gov
Website: www.dnr.wi.gov/org/land/er/review

CWE, Inc. 5707 Schofield Avenue, P.O. Box 107, Weston, WI 54476-0107 Toll Free: (800) 261-5707
Phone: (715)359-9400 Fax: (715)355-4199 Email: general@cwengineers.com Web: www.cwengineers.com

April 14, 2011

Ms. Lori Steckervetz, ER Review Assistant
Wisconsin Department of Natural Resources
Bureau of Endangered Resources
101 S. Webster Street, PO Box 7921
Madison, WI 53707-7921

Re: **Vernon County Landfill Clay Borrow Site**
Viroqua, WI
CWE Project # 946-1100

Subject: **Submittal of Endangered Resources Review Request (Form 1700-047)**

Dear Ms. Steckervetz:

In accordance with our previous conversations, CWE, Inc. is submitting the *Endangered Resources Review Request* document (Form 1700-047) to the Department for approval. The project involves the extraction of clay (to be used for landfill construction purposes) from a parcel of property located adjacent to the Vernon County Landfill (Balefill) site in Viroqua, Wisconsin. The proposed clay borrow site is located within the same 253-acre parcel where the landfill is located and is also owned by Vernon County.

Should you have any questions, please feel free to contact me at (715) 359-9400 or toll free at (800) 261-5707 or via email at czelenka@cwengineers.com.

Sincerely,
CWE, Inc.

Cindy L. Zelenka

Cindy L. Zelenka
Environmental Specialist

Enclosures

Cc: Mr. Gene Edwards, Solid Waste Manager, Vernon County Landfill, Box 247-B, Route 3, Viroqua, WI 54665

State of Wisconsin
Department of Natural Resources
Bureau of Endangered Resources
Attn: Endangered Resources Review Program
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Endangered Resources Review Request

Form 1700-047 (R 2/11)

Notice: An Endangered Resources (ER) Review of a proposed land development, management, planning, or similar type of project provides the requester with information from Wisconsin's Natural Heritage Inventory (NHI) database and other sources on rare plants and animals, high quality natural communities, and other endangered resources that may be impacted by the proposed project. The ER Review will also include specific recommendations to help projects comply with Wisconsin's Endangered Species Law (s. 29.604, Wis. Stats.) and other laws and regulations protecting endangered resources. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31-19.39, Wis. Stats.).

Instructions: The following materials are required to process this request. Submit all materials by mail to the address above or by fax (608-266-2925) or email (**DNRERReview@wisconsin.gov**). Do not include payment with this form.

- [x] Completed, signed form
- [x] Map(s) delineating the project area, preferably a topographic map and digital orthophoto (aerial photo)

Submission of the following materials are strongly encouraged and will facilitate review of your project:

- [x] Photographs that clearly show the project area, including natural features and vegetation present on site
- [x] Additional relevant information and reports (e.g., detailed project and habitat descriptions, wetland delineation, and site plans)

Section 1: Requester Information (ER Review, correspondence and invoice will be sent to this person)

Name	Organization		
Cindy Zelenka	CWE, Inc.		
Mailing Address	**City**	**State**	**ZIP Code**
PO Box 107	Weston	WI	54476-0107
Telephone Number	**FAX Number**	**Email Address**	
(715) 359-9400	(715) 355-4199	czelenka@cwengineers.com	

Section 2: Landowner Information (if different than Section 1)

Name	Organization		
Gene Edwards; Solid Waste Manager	Vernon Co. Solid Waste Committee		
Mailing Address	**City**	**State**	**ZIP Code**
Box 247-B, Route 3	Viroqua	WI	54665
Telephone Number	**FAX Number**	**Email Address**	
(608) 634-2900		gedwards@vernoncounty.org	

Section 3: Project Information

Project Name	Project Address *(if applicable)*
Proposed Clay Borrow Site (for Vernon Co. Balefill)	see legal description below

Project Types: ○ Residential ○ Commercial ○ Industrial ○ Utility ○ Transportation (roads, railroads, trails)
◉ Other: clay borrow site for landfill construction purposes

Start Date (on-site disturbance)	End Date (on-site disturbance)	Total Acreage
2011	2017	11 acres within 253-acre parcel

County: Vernon — ○ City ◉ Town ○ Village of: Viroqua

Township	Range	Direction	Section	Quarter Section	Quarter-Quarter Section	Additional Comments on TRS Location *(attach additional information if necessary)*
13 N	04	☐ E ☒ W	22	☒ NW ☐ NE ☐ SW ☐ SE	☒ NW ☐ NE ☐ SW ☐ SE	E 1/2 of NW 1/4 of NW 1/4
N		☐ E ☐ W		☐ NW ☐ NE ☐ SW ☐ SE	☐ NW ☐ NE ☐ SW ☐ SE	

Provide a detailed description of the proposed project and associated disturbance, including acres to be disturbed. Attach additional pages as needed.

The proposed project includes the excavation of clay soils (11 acres) from a borrow site to be used for construction purposes for the Vernon County Balefill (landfill.) The clay borrow site is located on an irregularly shaped 253-acre parcel owned by Vernon County. Both the landfill and proposed borrow site are located within this 253-acre parcel. The landfill will need approximately 55,000 cubic yards of clay to complete future construction activities. Approximately 69,750 cubic yards of acceptable clay are estimated to be available at the borrow site based on test pits and lab testing conducted on the clay samples. The clay will be excavated and hauled directly to the nearby landfill during clay mining activities, with no stockpiling of the clay anticipated at this time.

Section 3: Project Information, *continued*

Provide a detailed description of the habitat types and current land use within the project area (e.g., 50% in active agriculture-currently corn, 20% floodplain forest, 15% industrial area, 10% hardwood swamp dominated by black ash, 5% fallow field - in active agriculture until one year ago). Attach additional pages as needed.

Current land use within 1 mile of the project area is primarily agricultural, either as cropland or pasture. Sloping land to the northeast is wooded and used for private hunting. The Vernon Co. Solid Waste Plan (2002) indicates that there are no scientific or natural areas, state parks, or county forest lands within several miles of the proposed project site.

List all wetlands and waterbodies (e.g., rivers, intermittent streams, lakes, marshes) within one mile of the project area. List any known or suspected impacts of the proposed project to these wetlands and waterbodies. Indicate the location(s) of any point source discharge(s) into wetlands or waterbodies.

The project site is situated near the top of a ridge that separates Seas Branch from an intermittent tributary stream. There are no permanent surface water features at the site. Natural topography directs runoff to the east towards the intermittent tributary to Seas Branch. Ultimately, runoff from the site enters Seas Branch, which is impounded by an earthen dam located about 1 mile northeast of the site. Seas Branch valley also contains an area of wetlands and wetland indicator soils, some of which occur within 1/2 mile of the project. The excavation of clay at the project site is not expected to have any impact on these wetlands.

List any reports that have been prepared to describe habitat that may be impacted by the proposed project (e.g., wetland delineation, habitat assessments, and rare species surveys). Attach copies if available.

There are no anticipated impacts to wetlands, habitats or rare species associated with the clay borrow site project.

List any other project reports or correspondence concerning endangered resources. Include endangered resources reviews conducted by this or another agency (list log # and/or date issued) for this or a different phase of or alternative to the proposed project. Attach copies if available.

On May 1, 2002, the WDNR Bureau of Endangered Resources issued an approval letter for the existing sanitary solid waste landfill vertical expansion project (Log #02-051.) The landfill and the proposed clay borrow site are both part of the 253-acre parcel owned by Vernon County.

Section 4: Related Permits, Licenses or Regulatory Approvals

Permit, License or Approval	Issuing Agency, Program or Municipality	Contact Person	Status
Initial Site Inspection (ISI)	WDNR Solid Waste (for clay borrow site)	Martin Herrick (608) 789-5518	☐ will be applying for ☐ have applied for ☒ have received
Cultural Resource Clearance	DNR Archaeologist (for clay borrow site)	Victoria Dirst (920) 743-2083	☐ will be applying for ☐ have applied for ☒ have received
Plan of Operation	WDNR Solid Waste (for LF and clay site)	David Lundberg (715) 839-3708	☐ will be applying for ☐ have applied for ☒ have received

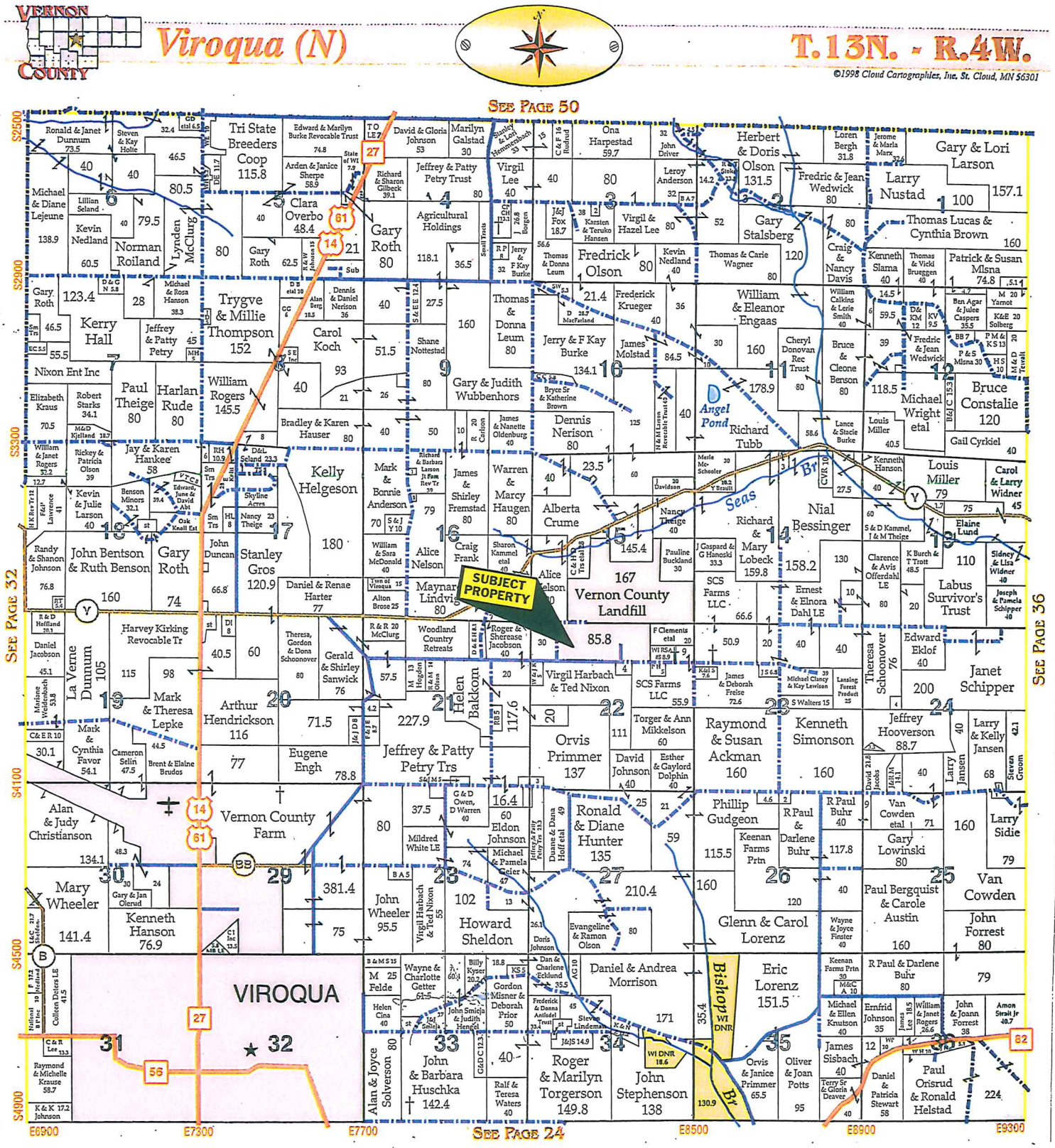
Section 5: Certification by Requester

I am the owner, authorized representative of the owner, or utility representative of the property for which I am requesting an Endangered Resources (ER) Review. To the best of my knowledge, the information I have provided is complete and accurate.

I understand that the requested ER Review may contain NHI data and information (including specific locations of endangered resources) which are considered sensitive and are not subject to Wisconsin's Open Records Law (per s. 23.27, Wis. Stats.). I agree to use the information contained in the ER Review solely for planning and implementation of the proposed project. As such, I agree to share information contained in the ER Review only with individuals who need this information to carry out specific roles in planning and implementation of the proposed project. I agree to not reproduce or disseminate the ER Review or the specific locations of endangered resources contained in the ER Review to any other parties or individuals without prior written permission from the Bureau of Endangered Resources. (Please contact the Endangered Resources Review Program at 608-264-6057 if you have any questions about sharing information contained in the ER Review.)

I agree to pay, within 30 days of receipt of an invoice, the fee charged by the Department for this ER Review (see Page 1 for details).

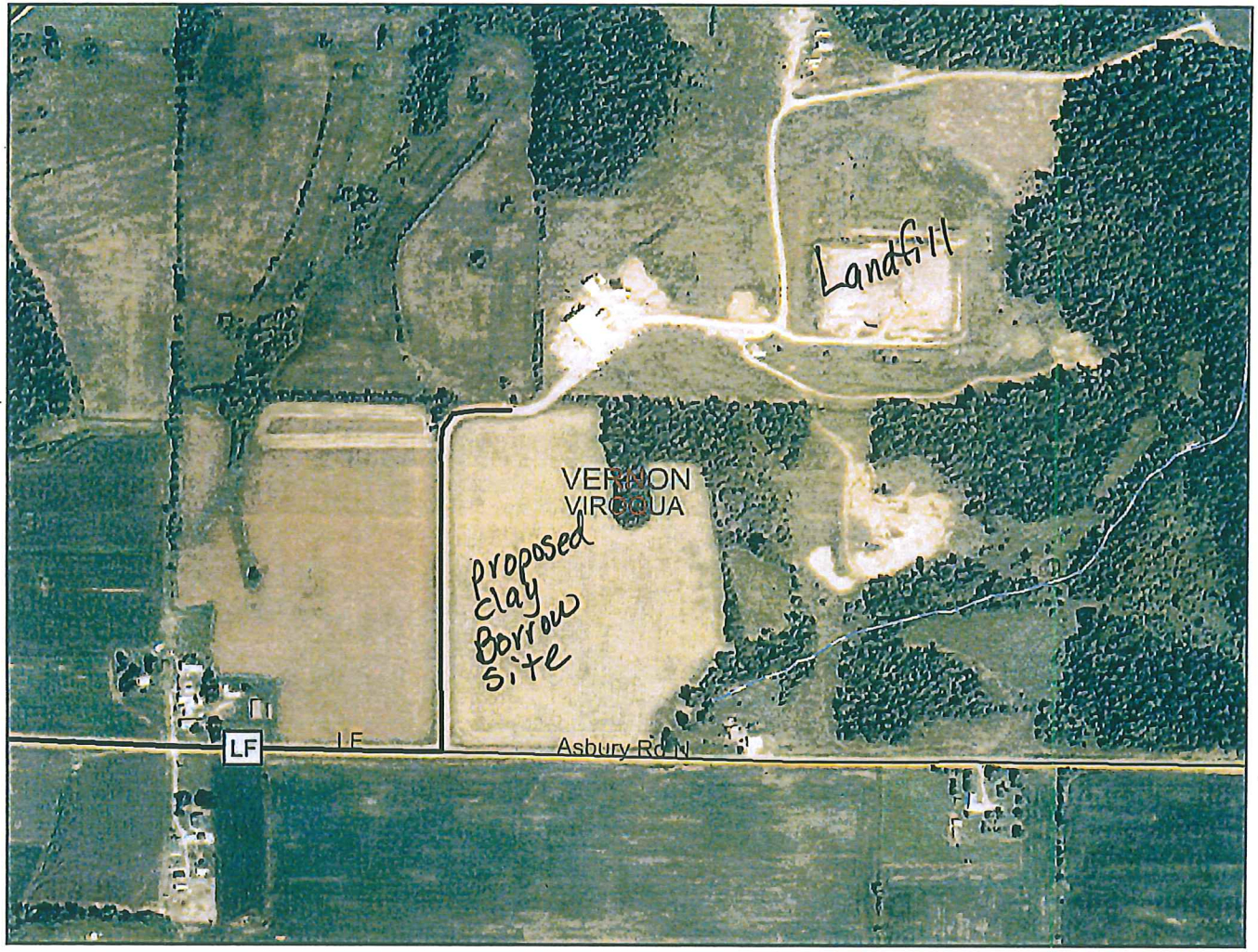
Signature of Requester	Date Signed	Name of Requester *(Please Print)*
Cindy L. Zelenka	4-12-2011	Cindy L. Zelenka, CWE, Inc.



CWE	CWE, Inc. 5707 SCHOFIELD AVE. WESTON, WISCONSIN 54476 PHONE:(715)359-9400 FAX:(715)355-4199 general@cwengineers.com www.cwengineers.com	PROJECT:	SITE LOCATION MAP PROPOSED CLAY BORROW SITE VERNON COUNTY, WI	CWE Project No.: 94611000	SOURCE: VERNON COUNTY LAND ATLAS/PLAT BOOK FIGURE 1

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Map Created on Apr 04, 2011





Legend

Major Highways
- Interstate
- State Highway
- U.S. Highways

County Roads

Local Roads

24K County Boundaries

Civil Towns
- Civil Town

USDA Wetspots

DNR Wetland Points
- Excavated Pond
- Dammed Pond
- Wetland Too Small to Delineate
- Filled Excavated Pond
- Filled Dammed Pond
- Filled Wetland Too Small to Delineate
- Filled or Drained Wetland

DNR Wetland Areas
- Upland
- Wetland
- Filled or Drained Wetland

Wetland Indicator Soils

24K Open Water

24K Rivers and Shorelines
- Intermittent
- Fluctuating
- Perennial

0 — 750 — 1500 — 2250 ft.

Scale: 1:7,496

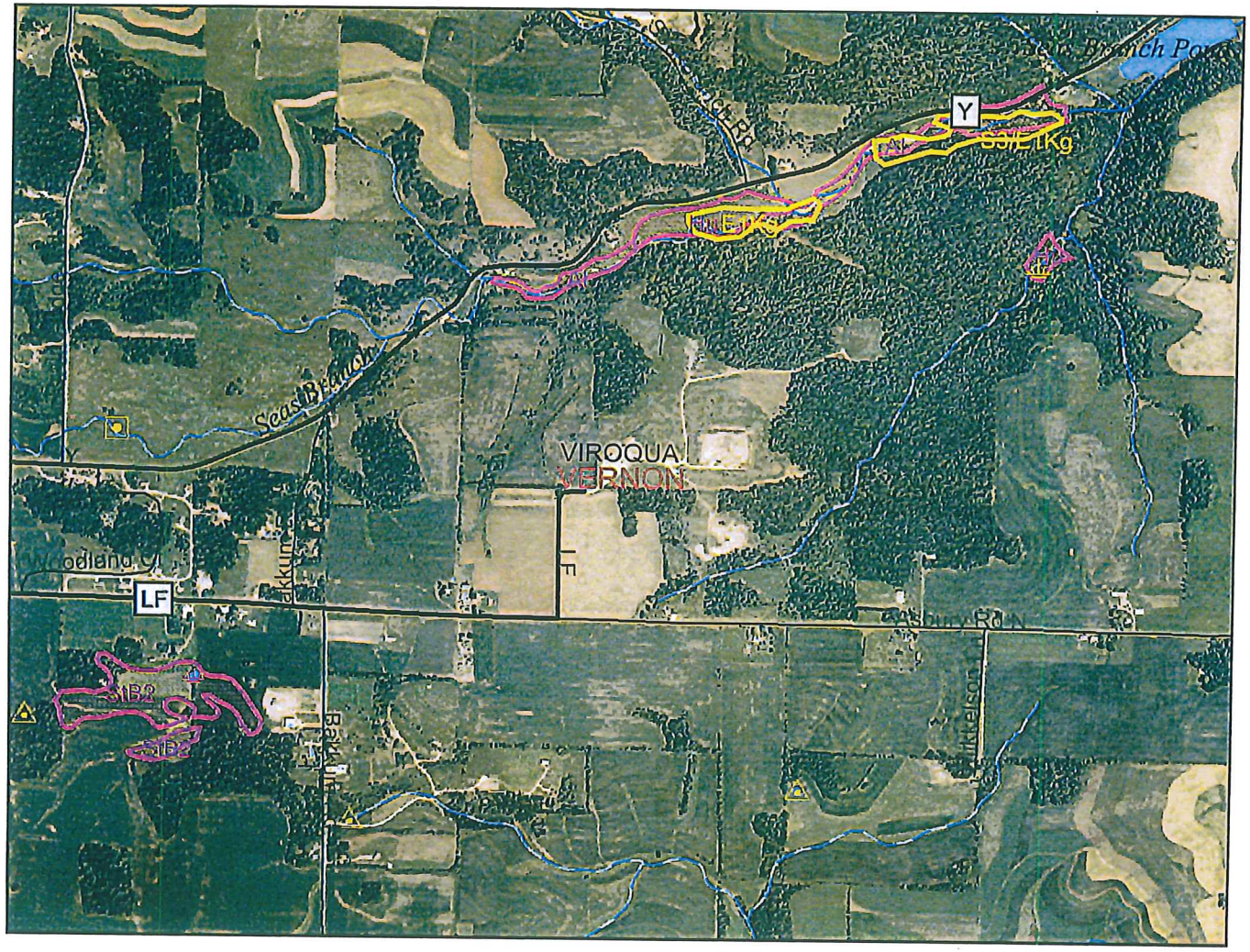
Map created on Apr 4, 2011

Wisconsin Wetland Inventory (WWI) maps show graphic representations of the type, size and location of wetlands in Wisconsin. These maps have been prepared from the analysis of high altitude imagery in conjunction with soil surveys, topographic maps, previous wetland inventories and field work. State statutes define a wetland as "an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions." The principal focus of the WWI is to produce wetland maps that are graphic representations of the type, size and location of wetlands in Wisconsin. Within this context, the objective of the WWI is to produce reconnaissance level information on the location, type, size of these habitats such that they are accurate at the nominal scale of the 1:24,000 (1 inch = 2000 feet) base map. The DNR recognizes the limitations of using remotely sensed information as the primary data source. They are to be used as a guide for planning purposes. There is no attempt, in either the design or products of this inventory, to define the limits of jurisdiction of any Federal, State, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State, or local agencies concerning specified agency regulatory programs and jurisdictions that may affect such activities. The most accurate method of determining the legal extent of a wetland for federal or state regulations is a field delineation of the wetland boundary by a professional trained in wetland delineation techniques.

Figure 2 – Clay Borrow Site - WDNR Aerial Project Location Map

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Map Created on Apr 04, 2011





Legend

Major Highways
- Interstate
- State Highway
- U.S. Highways

County Roads

Local Roads

24K County Boundaries

Civil Towns

Civil Town

USDA Wetspots

DNR Wetland Points
- Excavated Pond
- Dammed Pond
- Wetland Too Small to Delineate
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DNR Wetland Areas
- Upland
- Wetland
- Filled or Drained Wetland

Wetland Indicator Soils

24K Open Water

24K Rivers and Shorelines
- Intermittent
- Fluctuating
- Perennial

0 2000 4000 6000 ft.

Map created on Apr 4, 2011

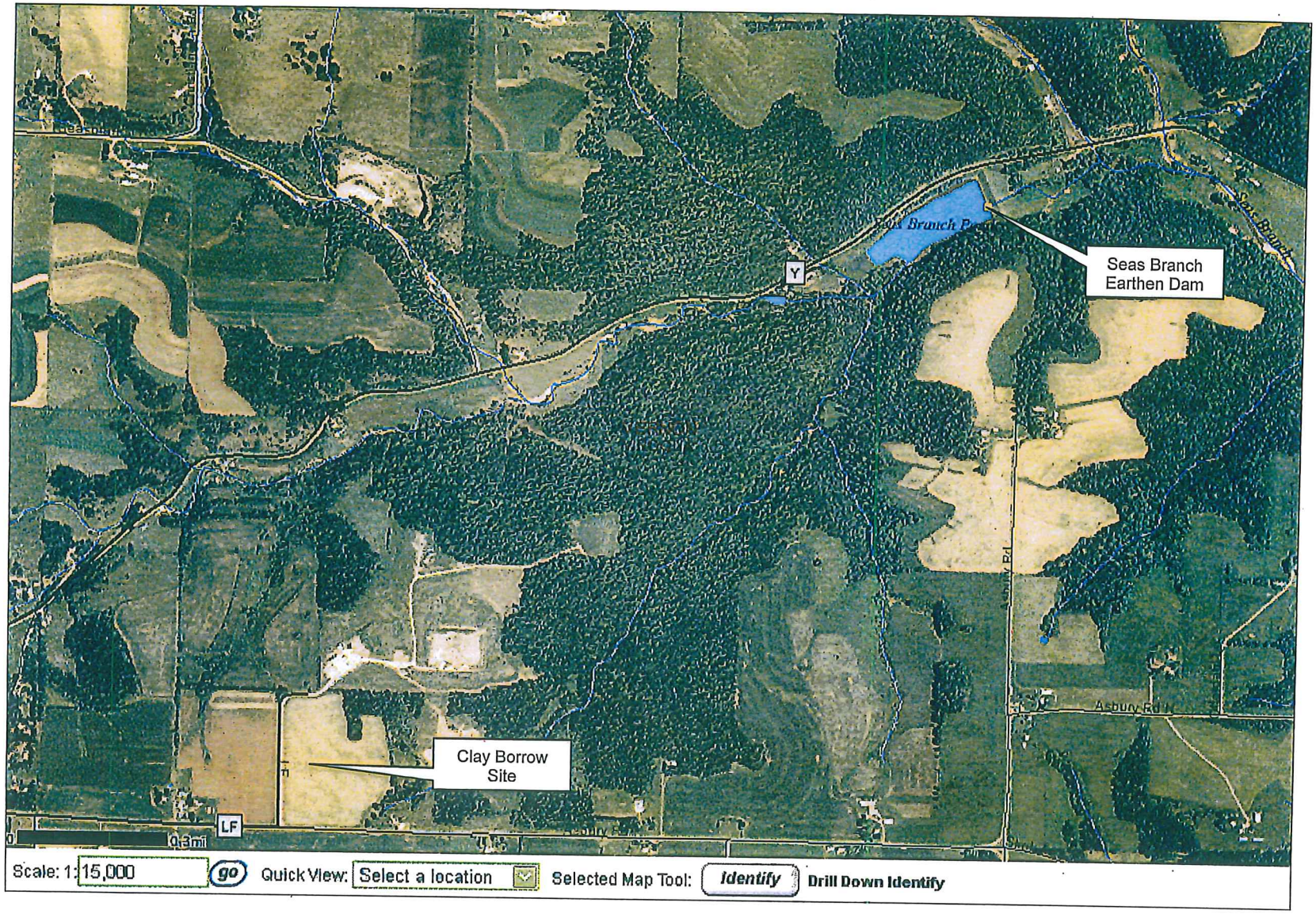
Scale: 1:19,959

Wisconsin Wetland Inventory (WWI) maps show graphic representations of the type, size and location of wetlands in Wisconsin. These maps have been prepared from the analysis of high altitude imagery in conjunction with soil surveys, topographic maps, previous wetland inventories and field work. State statutes define a wetland as "an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions." The principal focus of the WWI is to produce wetland maps that are graphic representations of the type, size and location of wetlands in Wisconsin. Within this context, the objective of the WWI is to produce reconnaissance level information on the location, type, size of these habitats such that they are accurate at the nominal scale of the 1:24,000 (1 inch = 2000 feet) base map. The DNR recognizes the limitations of using remotely sensed information as the primary data source. They are to be used as a guide for planning purposes. There is no attempt, in either the design or products of this inventory, to define the limits of jurisdiction of any Federal, State, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State, or local agencies concerning specified agency regulatory programs and jurisdictions that may affect such activities. The most accurate method of determining the legal extent of a wetland for federal or state regulations is a field delineation of the wetland boundary by a professional trained in wetland delineation techniques.

Figure 3 – Clay Borrow Site – WDNR Aerial Vicinity and Wetland Locator Map

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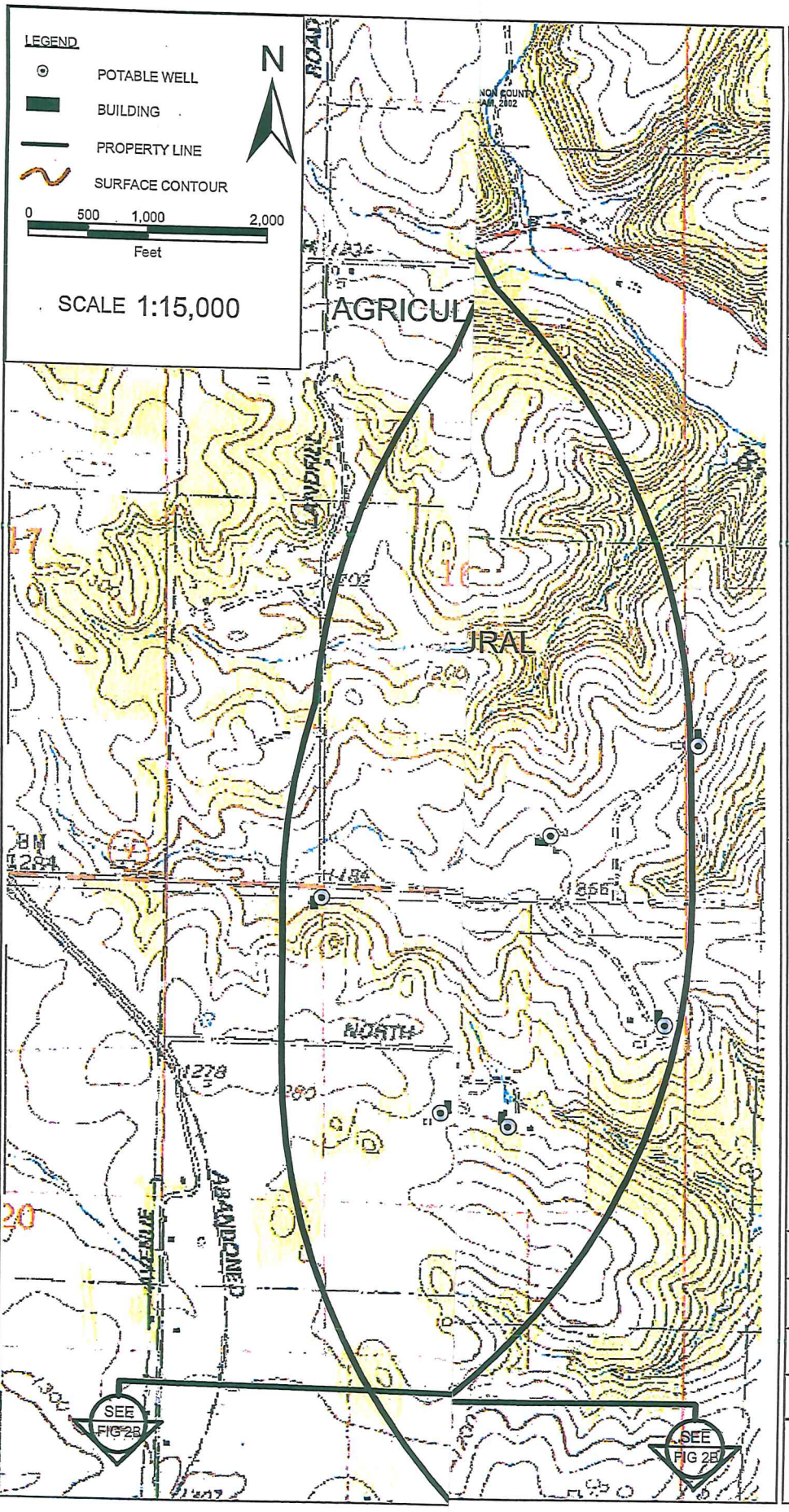
WDNR Map of Seas Branch Earthen Dam



North

Figure 4
Vernon County Landfill - Clay Borrow Site
WDNR Map of Seas Branch Earthen Dam

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CWE, Inc.
5707 SCHOFIELD AVE.
WESTON, WISCONSIN
54476
PHONE:(715)359-9400
FAX:(715)355-4199
general@cwengineers.com
www.cwengineers.com

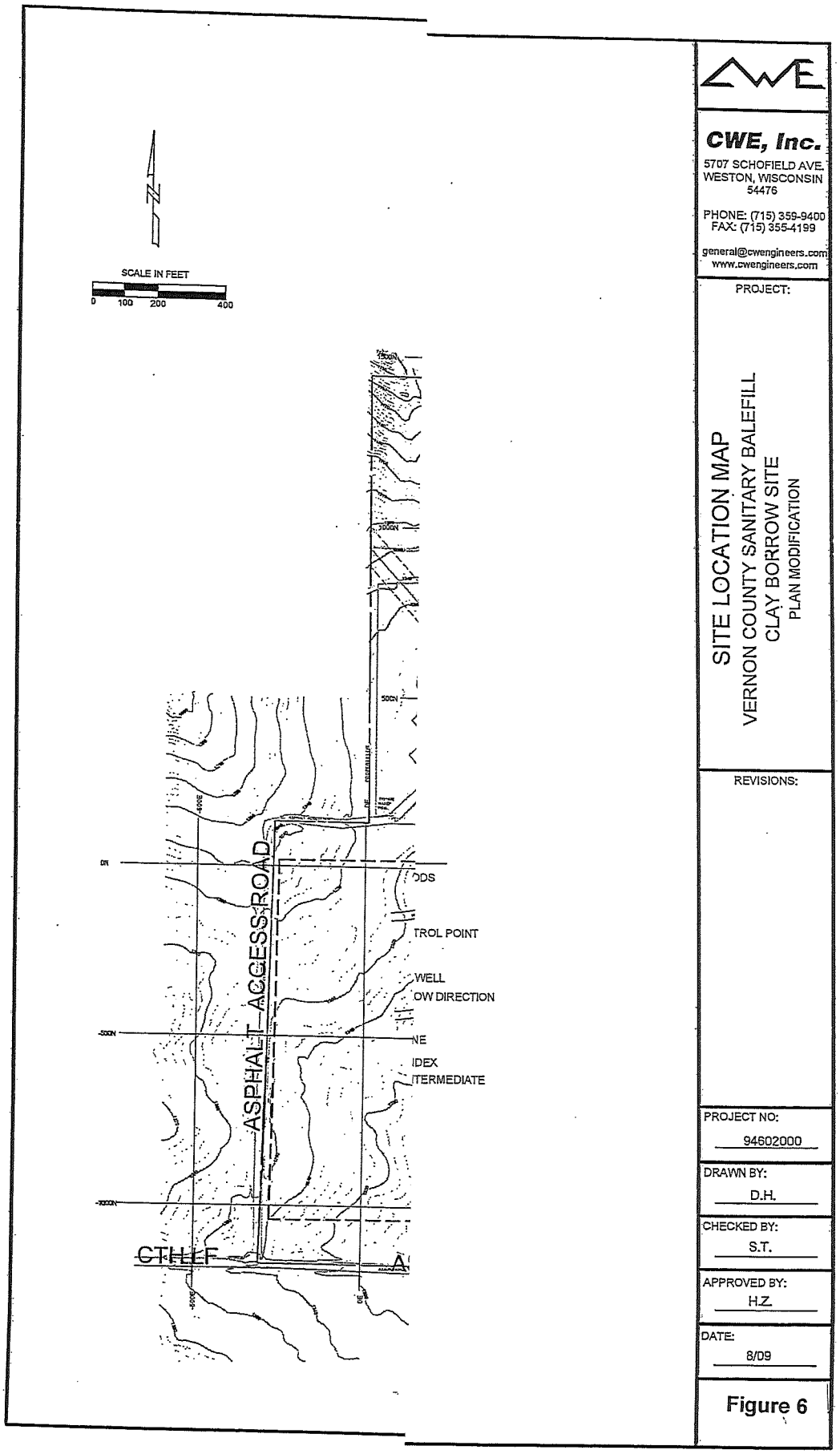
PROJECT:

USGS TOPOGRAPHIC MAP
VERNON COUNTY SANITARY BALEFILL
CLAY BORROW SITE INITIAL SITE INSPECTION

REVISIONS:

Drawn By:	H.S./ S.F.
Checked By:	D.O.
Approved By:	D.O.
Date:	07.18.02 REV. 03.15.10

Figure 5



CWE, Inc.
5707 SCHOFIELD AVE.
WESTON, WISCONSIN
54476

PHONE: (715) 359-9400
FAX: (715) 355-4199

general@cwengineers.com
www.cwengineers.com

PROJECT:

SITE LOCATION MAP
VERNON COUNTY SANITARY BALEFILL
CLAY BORROW SITE
PLAN MODIFICATION

REVISIONS:

PROJECT NO: 94602000

DRAWN BY: D.H.

CHECKED BY: S.T.

APPROVED BY: H.Z.

DATE: 8/09

Figure 6

J:\JOBS\FTVERNON\CLAY BORROW SITE\TOTAL SITE.dwg, SITE, 4/4/2011 3:03:22 PM

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Scott McCallum, Governor
Darrell Bazzell, Secretary

101 S. Webster St.
Box 7921
Madison, Wisconsin 53707-7921
Telephone 608-266-2621
FAX 608-267-3579
TTY 608-267-6897

May 1, 2002

Mr. Daryl Peterson P.E.
Central Wisconsin Engineers and Architects Inc.
5707 Schofield Avenue
Weston, WI 54476

SUBJECT: Endangered Resources Review (Log # 02-051)
Vertical Expansion of Existing Sanitary Solid Waste Landfill

Dear Mr. Peterson:

The Bureau of Endangered Resources has reviewed the project area described in your letter of March 4, 2002 for the proposed vertical expansion of an existing sanitary landfill in Vernon County.

Our Natural Heritage Inventory (NHI) data files contain no occurrence records of Endangered, Threatened, or Special Concern species, natural communities, or State Natural Areas that we believe would be impacted by the project as currently proposed, nor for the actual project areas in T13N R4W, Section 15 Vernon County.

Although there are no records in the NHI database of endangered resources occurring at the project site, comprehensive endangered resource surveys have not been completed for the project area. As a result, our data files may be incomplete. Given your description of the project site and the nature of the proposed project we do not believe that further surveys are warranted.

This letter is for informational purposes and solely addresses endangered resource issues. This letter does not constitute Department of Natural Resources authorization of the proposed project and does not exempt the project from securing necessary permits and approvals from the Department.

Please contact me at (608) 266-8736 if you have any questions about this information.

Sincerely,

Jennifer Bardeen

Jennifer Bardeen
Bureau of Endangered Resources

CC: Jim Doperalski-WCR-LaCrosse
Martin Herrick-WCR-LaCrosse

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CWEA CENTRAL WISCONSIN ENGINEERS ARCHITECTS

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5707 Schofield Avenue
P.O. Box 107
Weston, WI 54476-0107
www.cwengineers.com

Tel 715.359.9400
Fax 715.355.4199
Toll-free 800.261.5707
general@cwengineers.com

July 12, 2005

Ms. Jennifer Bardeen
Bureau of Endangered Resources
Department of Natural Resources
101 South Webster Street
P.O. Box 7921
Madison, WI 53707-7921

Re: **Proposed Clay Borrow Site**
Vernon County Balefill, License No. 03268
CWEA Project No. 94602000

Subject: Endangered Resources Review

Dear Ms. Bardeeen:

Vernon County intends to construct a vertical expansion to its sanitary balefill once the plan of operation for this expansion is approved. To insure that a sufficient volume of clay is available for construction, the County desires to use an undeveloped portion of its balefill property as a clay borrow site (a map showing the proposed borrow site location is included with this letter). This land has most recently been used as an agricultural field.

On behalf of the County, Central Wisconsin Engineers & Architects, Inc. is submitting a request for a review and identification of any critical habitat areas and state or local natural areas within one mile of this proposed borrow site, in accordance with s. NR 512.15 (1), Wis. Adm. Code. The property is located in T13N, R4W, Section 22, Town of Viroqua, Vernon County.

I appreciate your efforts in assisting us in this project. If you have any questions, please contact me at 715-359-9400.

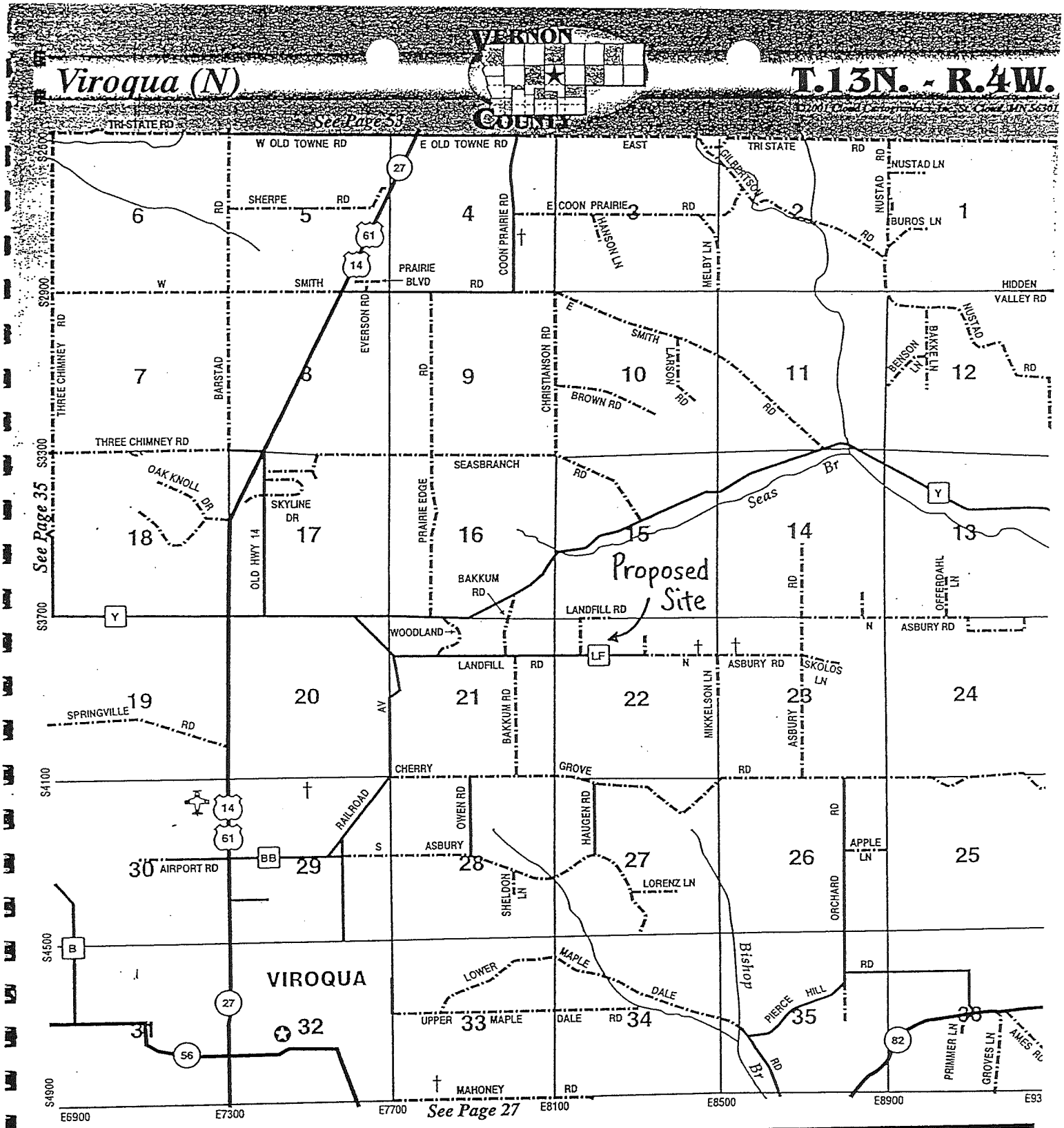
Sincerely,
Central Wisconsin Engineers & Architects, Inc.

Peter D. Arntsen, M.S., P.H.
Hydrogeologist

Enclosures

cc: Mr. Gail Frie, Box 247-B, Route 3, Viroqua

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P.O. Box 107
Weston, WI 54476-0107
www.cwengineers.com

Tel 715.359.9400
Fax 715.355.4199
Toll-free 800.261.5707
general@cwengineers.com

July 13, 2005

Ms. Victoria Dirst, Ph.D.
DNR Archaeologist
Department of Natural Resources
Archaeology Office
952 Tacoma Beach Road
Sturgeon Bay, WI 54235

Re: **Proposed Clay Borrow Site**
Vernon County Balefill, License No. 03268
CWEA Project No. 94602000

Subject: Archaeological and Historical Sites Review

Dear Ms. ~~Bardeeen~~ Dirst:

Vernon County intends to construct a vertical expansion to its sanitary balefill once the plan of operation for this expansion is approved. To insure that a sufficient volume of clay is available for construction, the County desires to use an undeveloped portion of its balefill property as a clay borrow site (a map showing the proposed borrow site location is included with this letter). This land has most recently been used as an agricultural field.

On behalf of the County, Central Wisconsin Engineers & Architects, Inc. is submitting a request for a review and identification of any historical or archaeological areas within the vicinity of this proposed borrow site, in accordance with s. NR 512.15 (1), Wis. Adm. Code. The property is located in T13N, R4W, Section 22, Town of Viroqua, Vernon County.

I appreciate your efforts in assisting us in this project. If you have any questions, please contact me at 715-359-9400.

Sincerely,
Central Wisconsin Engineers & Architects, Inc.

Peter D. Arntsen, M.S., P.H.
Hydrogeologist

Enclosures

cc: Mr. Gail Frie, Box 247-B, Route 3, Viroqua

94603000, Vernon Co LF

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Archaeology Office
962 Tacoma Beach Rd.
Sturgeon Bay, WI 54235
Telephone: 920-743-2083

Jim Doyle, Governor
Scott Hassett, Secretary

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July 15, 2005

Peter D. Arntsen
Central Wisconsin Engineers & Architects
5707 Schofield Ave., Box 107
Weston, WI 54476-0107

SUBJECT: Clay Borrow Site for Vernon County Balefill

Dear Mr. Arntsen:

I have reviewed Wisconsin Historical Society files and have determined that the proposed clay borrow site for the Vernon County Balefill will not impact any known archaeological sites or historic structures. This project, located in T13N, R4W, section 22, has cultural resource clearance.

Sincerely,

Victoria Dirst

Victoria Dirst, Ph.D.
DNR Archaeologist

PLAN OF OPERATION

FOR

VERTICAL EXPANSION

VERNON COUNTY SANITARY BALEFILL

LICENSE NO. 3268

FID NO. 663038310

CWEA PROJECT # 94602000

January 2005

east corner will also force the current site access road slightly to the north (see Plan Sheet 10). The only other clearing that might be necessary is associated with the clay borrow source area (see Plan Sheet 23).

Where clearing and grubbing are required, the work shall be performed by a private contractor. Existing trees and brush will be removed, and any stumps will be excavated, burned and buried. Details concerning the clearing and grubbing process are described in Section 2.12.1.

2.3.2 Excavations

2.3.2.1 Topsoil Stripping

During the initial phase of construction, roughly 19,500 cubic yards of topsoil were stripped from (1) the area under the balefill's south berm, (2) the area under the south half of the balefill's east berm, (3) the area developed as Phase I, Module I, (4) the area north of the south berm where leachate lines were installed, (5) all road areas, (6) the building and parking areas, and (7) the sedimentation basin. Additional topsoil was stripped as operations expanded first into Phase II, Modules 1 and 2, and Phase III, Modules 1 and 2. Topsoil stripping will again be required when the sedimentation basin is enlarged in 2005, when Phase II, Module 3 and Phase III, Modules 3 and 4 are developed, and whenever clay is excavated from the on-site borrow source.

2.3.2.2 Base Grade Excavations

Base grade excavations have already been made for Phase I, two modules of Phase II, and two modules of Phase III construction (see Plan Sheet 4). Additional excavations will be needed as development expands horizontally into Phase II, Module 3 and Phase III, Modules 3 and 4, but no excavation is required to construct the vertical expansion. The excavation quantities for each remaining phase of construction are included in Appendix I. It should be noted that Module 1 of Phase III required fill in its southeast corner to achieve the desired base grades; therefore, the net amount of excavated material from this module was 18,732 cubic yards.

2.3.2.3 Sedimentation Basin

A sedimentation basin was excavated during initial construction activities for the existing balefill; however, the vertical expansion feasibility study concluded that a larger basin is needed to store runoff from this site. Therefore, additional excavation will occur to enlarge this basin in 2005, as shown on Plan Sheet 9. Approximately 0.5 acres will be disturbed by this excavation.

2.3.2.4 Clay Borrow Source

Approximately 66,400 cubic yards of clay meeting the specifications of s. NR 504.06 (2) are still required to construct and close this facility (see Section 2.13.2). 26,000 cubic yards of clay will come from excavations during construction of the enlarged sedimentation basin in 2005 and the development of Phase II, Module 3 plus Phase III, Modules 3 and 4 in 2008 (see Plan Sheets 9 and 10). Thus, the remaining 40,400 cubic yards must come from the on-site borrow source.

The first step in clay excavation is the stripping of topsoil, which is then stockpiled as described in Section 2.3.2.1. Clay is excavated using a backhoe or scraper. When a backhoe is used, the clay is placed in a dump truck for transport to the construction area; when a scraper is used, the excavated material is taken directly to the construction area. In either case, any material that

does not meet the specifications of s. NR 504.06 (2) is separated from the acceptable clay and stockpiled for other uses (i.e., backfill, daily cover, or sand).

Whenever clay is excavated from the borrow site, a qualified representative of the engineering firm overseeing construction will be present to inspect the material and collect samples for verification testing. The procedures used to separate acceptable from unacceptable clay and the sampling and testing procedures are described in Section 2.12.3.2.

When excavation from the clay borrow source is completed, the borrow area will be graded as shown on Plan Sheet 23, covered with topsoil, and seeded. More details on the reclamation of this area are included in Section 2.9.3.

2.3.3 Soil Storage and Screening

Topsoil stripped in the past has been stockpiled both to the north and west of the waste fill area, as shown on Plan Sheet 4, and the topsoil stripped for future construction activities will also be placed in these locations. Because of natural screening, this stockpile is not visible from public roadways; therefore, additional screening measures are not necessary.

2.3.4 Daily Cover

Material used for daily cover material has been excavated from a small borrow site on the south side of the facility property on as-needed basis. This procedure will continue throughout the life of the balefill; thus no stockpiling of this material will be necessary.

2.3.4.1 Topsoil

Topsoil has been salvaged and stockpiled in the area shown on Plan Sheet 4 as each phase of construction has proceeded. This area is large enough to hold approximately 24,000 cubic yards of material with 3:1 side slopes, which is more than adequate to handle the topsoil volumes that are generated. Topsoil stockpiled for more than six months is seeded to prevent erosion.

2.3.4.2 Clay

During 2005 and 2008 construction activities, roughly 26,000 cubic yards of excess clay will be excavated and stockpiled in the area west of the balefill that is shown on Plan Sheet 10. After 2008, the volume of clay needed for construction purposes will exceed the amount excavated, so the additional clay required will be taken from the stockpile. Once the stockpile is exhausted (during 2011 construction activities), clay will be excavated from the on-site borrow source on an as-needed basis, and no further stockpiling will be required.

2.3.4.3 Sand

Sand for use in the drainage layer of the composite liner system has come from a commercial, off-site source, and this will continue for all future liner and cover system construction.

2.3.4.4 Screening

Soil storage for the purpose of creating a visual screen has not been necessary at this site. The combination of natural topography, pre-existing woodlands, and the planting of trees in selected

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary
Scott Humrickhouse, Regional Director

West Central Region Headquarters
1300 W. Clairemont Avenue
PO Box 4001
Eau Claire, Wisconsin 54702-4001
Telephone 715-839-3700
FAX 715-839-6076
TTY Access via relay - 711

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July 29, 2005

Mr. Gail Frie, Solid Waste Manager
Vernon County Solid Waste/Recycling Facility
S3705 County Road LF
Viroqua, WI 54665

FID # 663038310
Vernon County
SW/Approvals

Subject: Conditional Plan of Operation for the Proposed Vertical Expansion of the Vernon County Balefill (Landfill), Vernon County, Wisconsin, WDNR License # 3268

Dear Mr. Frie:

We have completed our review of your plan of operation for the proposed vertical expansion of the Vernon County Balefill (Landfill) and determined that it is consistent with Wisconsin's solid waste regulations. Therefore, the plan of operation is approved and you can begin construction of the landfill, subject to compliance with chs. NR 500-590, Wis. Adm. Code, the conditions in the attached approval and the July 20, 1992 Plan of Operation Approval and subsequent plan modifications. This approval should be maintained with the July 20, 1992 Plan of Operation Approval. Please note that this vertical expansion approval does not replace many of the landfill's approved features, with the exception of the volume, final grades, leachate collection system and surface water management features.

Conditions for construction, operation, groundwater monitoring and reporting has been included in the approval. Note that we have approved all of your variance requests in the feasibility portion of the approval process with the exception of your exemption request for placing interim cover on areas which have reached final grade. The request was rescinded in a June 8, 2004 electronic mail from Peter Arntsen of Central Wisconsin Engineers to Brian Kalvelage of the Department.

The proposed vertical expansion includes removal of portions of the temporary cap system. We are concerned that this may result in release of odors, and this approval requires that additional control measures be developed and that exposure of waste be limited by using interim cover if necessary.

A number of design and construction enhancements are required by this approval. Details are included in the attached conditions.

Environmental monitoring in this approval has been slightly modified from the monitoring proposed in the plan of operation report (January 2005). For example, the "COD" parameter has been eliminated from the lysimeter monitoring but is being retained in leachate monitoring. In addition, lysimeter monitoring parameters, "liquid volume removed" and "depth to liquid" have been changed to monthly monitoring with corresponding data submittals attached to the semi-annual sampling results. Please be aware of any other changes to the environmental monitoring summary.

Mr. Gail Frie
Vernon County Balefill Landfill
Plan of Operation Approval

You are reminded this approval does not relieve you of obligations to meet all other applicable federal, state and local permits, as well as zoning and regulatory requirements.

If you have questions regarding this approval, please contact Brian Kalvelage, Hydrogeologist at (608) 785-9983, Marty Herrick, Environmental Engineer at (608) 789-5518, or Dave Lundberg, Waste Program Manager at (715) 839-3708.

Sincerely,

David R. Lundberg
Waste Program Manager
West Central Region

CC: Brian Kalvelage/ Marty Herrick-La Crosse
Mike Ross- La Crosse
Jack Connelly-SW/3
Ron Hoff, Clerk, Vernon County, Room 108 Courthouse Annex, Viroqua, WI 54665
Patricia Olson, Clerk, Town of Viroqua, S5117 County Rd. NN, Viroqua, WI 54665
Hoohsang Zeyghami, Central Wisconsin Engineers, 5707 Schofield Avenue, Weston, WI 544476-0107

PROJECT SUMMARY
VERNON COUNTY BALEFILL (LANDFILL)
VERTICAL EXPANSION

GENERAL INFORMATION

AUTHORIZED CONTACT:

Gail Frie, Solid Waste Manager
Vernon County Solid Waste/Recycling Facility
S3705 County Road LF
Viroqua, WI 54665
Phone Number (608) 634-2900

LICENSEE AND PROPERTY OWNER: Vernon County Solid Waste Department

SITE LOCATION: Vernon County Solid Waste Department has proposed a vertical expansion of its existing Balefill (MSW) facility located in NW 1/4 of the SE 1/4, NE 1/4 of SW 1/4, SE 1/4 of the SW 1/4 and the SW 1/4 of the SE 1/4 in Section 15, T13N, R 4W, Town of Viroqua, Vernon County, Wisconsin.

PROPOSED CAPACITY AND SITE LIFE: The existing balefill landfill has a design capacity of 315,000 yd^3 and the vertical expansion will add 275,000 yd^3 for a total waste capacity of 590,000 yd^3. The footprint for the balefill occupies approximately 10 acres of the 253-acre site. The vertical expansion will add approximately eight years of site life with an expected closing date of 2017. The projected landfill closing date is based on a 5% yearly increase of filling for MSW waste, an estimated waste density of .584 tons/yd^3 and the addition of the Construction & Demolition (C& D) waste, which will be diverted to the balefill landfill when the C&D landfill closes in approximately 2007.

WASTE TYPES AND GENERATORS SERVED: The facility will continue to accept non-hazardous municipal, industrial and approved special wastes generated exclusively in Vernon County. Additionally in 2007 the onsite C&D landfill is projected to close. For Vernon County C&D waste makes up approximately 25% of the waste stream. After the C&D landfill closes, the wastes will be diverted to the balefill. Waste composition and leaching behavior in the expansion are not expected to be substantially different from those in the current landfill based on the less leachable composition of C&D wastes. However the chemical characteristics of the leachate generated from this expansion may change based on the amount of gypsum wallboard received and the potential exists for fugitive odors from reduced sulfur compounds.

PRESENT LAND USE AND ZONING: Land uses adjacent to the balefill include rural residential, agricultural, private hunting lands and areas harvested for timber. Vernon County currently has no zoning ordinances. The Vernon County Solid Waste Management Plan indicates that there are no scientific or natural areas, State Parks, or County forest lands within several miles of the facility. The Department's Bureau of Endangered Resources determined that no environmentally unique areas are located near the facility. Additionally correspondence with the Department's Archaeologists indicates that there are no known archaeological or historical sites on the property.

Approximately 10 acres of the site is used for the footprint of the balefill landfill with another 4 acres of associated facilities. The Vernon County recycling facility occupies about 4 acres and the C&D landfill occupies approximately 3.7 acres. The recycling facility and the C&D landfill are located approximately 660 feet west and 960 feet north east of the balefill landfill respectively. The balefill landfill is located down gradient of the recycling facility and up gradient of the C&D landfill.

The balefill has an approved on site borrow source with part of it overlapping the landfill footprint. The vertical expansion will require minimal additional clay soils and the site has adequate quantities of material meeting the performance standards in NR 504, Wis. Adm. Code for both liner and cap applications.

SITE CHARACTERISTICS: The site geology and hydrogeology has been previously described in the feasibility report for the Balefill Landfill. Generally, the geology in the vicinity of the landfill consists of clayey silt surficial deposits approximately 4 to 8 feet thick. Below this is a residuum unit approximately 7 to 36 feet thick deposited from weathered bedrock. This unit's fine-grained soils are classified under the Unified Soil Classification System (USCS) as CL clay and typically meet the performance standards in NR 504.06(2)(a), Wis. Adm. Code for landfill liner and capping applications. This unit also contains sandy horizons. Below the residuum the unconsolidated material transitions from silt, sand and gravel deposits to weathered bedrock. The uppermost bedrock unit is approximately 35 feet below the surface but varies with the surface topography. This dolomite unit is part of the Prairie du Chien group. With depth the dolomite becomes more competent and ultimately transitions to Jordan sandstone.

There is a perched water table is in the Prairie du Chien group which is encountered at depths of 80 to 120 feet below the ground surface. The second water table is encountered at depths of 135 to 195 feet below the ground surface and varies with topography and seasonal recharge. Based on the site variability the sites' water table can flow in the opposite direction of the regional water table, which flows north-northeast.

FACILITY DESIGN: The overall design for the balefill will not change for the vertical expansion appreciably, with the exception of the final grades, the leachate collection tank, the sedimentation basin and the phasing for filling the facility. The proposed vertical expansion would not change the currently approved liner design.

The landfill is designed with a composite liner system. The clay component of the liner is 5 feet thick and, above the clay, the design includes a 60-mil High-Density Polyethylene (HDPE) geomembrane. The proposed leachate collection layer above the geomembrane is an 18-inch granular drainage layer with a minimum hydraulic conductivity of $1X10^{-2}$ cm/s. Eighteen inches of washed 3/4 inch gravel is placed above the v-shaped collection trenches.

The landfill is designed with sideslope risers that route the collected leachate to the below grade leachate collection tank. From the sideslope risers the leachate gravity drains to the existing leachate collection tank and then a lift station is used to pump it to the load out area. As part of this approval an aboveground leachate collection tank will be added to the system and all associated pumps and mechanical controls will protected in weatherproof enclosures. Ultimately the collected leachate is sent to the City of Viroqua, WI Wastewater Treatment Plant for treatment and discharge. The Cities of LaFarge, WI and Stoddard, WI Wastewater Treatment Plants are also available to treat leachate. Leachate headwells are used to monitor the head elevations in the waste mass.

The landfill has an active gas extraction system, which incorporates a series of vertical extraction wells, laterals, a header system, blower and flare. Gas will be collected from the extraction wells and routed through the headers to the flare. Gas will be burned with a propane assisted 60,000 BTU/HR flare and a 140 CFM blower, which maintains 40 inches of water column on the system. Gas probes are located beyond the landfill footprint to check for gas migration. Under NR 506.08(6), Wis. Adm. Code all landfills with greater than 500,000 cubic yards shall collect and combust hazardous air contaminants. The Vernon County Balefill Landfill capacity with the vertical expansion is 590,000 cubic yards.

Final cover for the landfill includes from the top of the waste up a 12 inch soil grading layer, a 24 inch clay layer, a 40 mil LLDPE geomembrane, a 12 inch granular drainage layer, a 24 inch rooting zone for protective cover and 6 inches of topsoil. The topsoil will be seeded, mulched and measures will be implemented to prevent erosion.

Surface water management features include riprapped waterways, diversion berms, culverts and a sedimentation basin. As part of this approval two additional retention structures will be required upstream of the existing sedimentation basin to reduce its flow and loading. Measures will be also be implemented for erosion control during construction including silt fencing, straw bales, and erosion blankets. During the vertical expansion the amount of non-contact water will vary depending on the lateral extent of the final cover. The vertical expansion will be phased to minimize the quantity of leachate generated. As more phases of the landfill are completed the volume of non-contact surface water to be managed will increase accordingly.

The final use for the landfill is green space.

ENVIRONMENTAL MONITORING: Environmental and performance monitoring will extend through the period of active site operation and perpetual long-term care. Monitoring data will be reported to the Department electronically in a format supplied by the Department, as specified in s. NR 507.26(3), Wis. Adm. Code. To determine exceedances of groundwater standards, analytical results shall be compared to the indicator Preventive Action Levels (PALs) in Table A and the Alternate Concentration Limits (ACLs) in Table B of the attached approval, or the standards in ch. NR 140, Wis. Adm. Code. Environmental monitoring shall be conducted in accordance with the attached Environmental Monitoring Summary.

Vernon County Balefill will be issued a permit from the Department's Air Management Program. On February 16, 2005 Central Wisconsin Engineers on behalf of Vernon County submitted an Air Pollution Control Construction Permit Application to the Department. On April 26, 2005 the Department issued Vernon County a Notice of Incompleteness for the air permit application. On July18, 2005 Central Wisconsin Engineers submitted additional information for the air permit application.

CLOSURE AND LONG TERM CARE COSTS: All landfill phases are required to complete closure in accordance with NR 506.08, Wis. Adm. Code. Closure costs are based on a worst case closure scenario where the highest cost would be incurred if the landfill had to prematurely close. Because this is a vertical expansion, worst case closure moneys are already in place. As part of this approval, Vernon County has revised the worst case closure costs to reflect the new construction conditions with the vertical expansion. Vernon County will use a cash deposit as a financial assurance instrument for the closure costs.
The premature closure would entail site grading to maintain positive drainage if needed, installing the final cover system, seeding the final cover system, completing construction of the gas extraction system and preparing a closure documentation report. The final cover system is composed of a 1 foot grading layer, 2 feet of clay soils, the 40 mil LLDPE geomembrane, 1 foot sand drainage layer, 2 feet of rooting zone soils, 6 inches of topsoil, vegetative cover and the surface water management features.

CLOSURE COSTS:

Item	Quantity	Unit Cost	Estimated Cost
Composite Cover			
(7.6 Acre)			
.6" Grading Layer	6131 CY	$ 3.00 CY	$18392.00

Clay Liner (24")	24523 CY	$ 4.05 CY	$99316.80
Drainage System (12"& Drains)	12261 CY	$ 6.75 CY	$82764.00
Geomembrane (40mil LLDPE)	331056 SF	$ 0.40 SF	$132422.40
Rooting Zone Layer (24")	12261 CY	$ 5.00 CY	$61306.67
Topsoil (6 in)	6131 CY	$ 4.50 CY	$27588.00
Erosion Control	36784 SY	$1.20 SY	$44140.80
Seed, Fertilizer, Lime, Mulch	7.6 Acre	$ 5904 Acre	$44870.40
Construction Documentation & Administration			$76620.16
Total Composite Cover Cost			**$587421.23**
Gas Extraction System			
Blower & Flare			$90000.00
Gas Extraction Wells (36")	173 VF	$100 VF	$17300.00
Gas Extraction Well Head	7	$1250/Well	$8750.00
Gas Piping	1554 LF	$18.91 LF	$29386.14
Construction Documentation & Administration			$21815.42
Total Landfill Gas Extraction System			**$167251.56**
Subtotal			$754672.79
Contingency (10%)	1	%	$75467.28
Total Worst Case Closure Cost			**$830140.07**
Cost/Acre			**$109228.96**

LONG TERM CARE COSTS:

Although Vernon County will be perpetually responsible for the long term care of the landfill, proof of owner financial responsibility for a long-term care period of 40 years is required. Actions to be taken after closure and during the 40 year owner financial responsibility period, along with the associated cost estimates, are summarized below.

The long term care costs are itemized below and reflect the estimated yearly expenses for:

Item	Quantity	Unit Cost	Estimated Cost/40Year
Cover Vegetation & Surface Settlement	As Required	$800	$32000
Drainageways, Sedimentation Basin, Erosion Control	As Required	$1260	$50400
Leachate Control System			
Coordination, Administration, Evaluation	1	$40	$40000
Transport & Disposal	As Required	$7200	$288000
Line Cleaning	Annual	$1500	$60000
Monitoring	As Required	$2109	$84360
Equipment Replacement/Repair	As Required Including 1 Leachate Collection Tank Replacement	$750	$30000
Electricity	Monthly		
Engineering	1	$1000	$40000
Gas Control System			
Coordination, Administration, Evaluation	1	$1000	$40000
Maintenance	Annual	$1040	$41600
Monitoring	As Required	$5913	$236520
Equipment Replacement/Repair	As Required	$500	$20000
Engineering	1	$1000	$40000
Environmental Monitoring			
Coordination, Administration, Evaluation	1	$1000	$40000
Gas	As Required	$65	$2600
Groundwater	As Required	$7509	$300360
Water Supply	As Required	$486	$19440
Surface Water	As Required	$44	$1760
Unsaturated Zone	As Required	$462	$18480
Reporting	As Required	$2600	$104000
Subtotal			$1489520
Contingency (10%)		10%	$148952
Total			**$1638472**

PERIOD OF LONG TERM CARE RESPONSIBILITY: Vernon County has, by law, a 40 year proof of financial responsibility period for long term care following landfill closure. However, Vernon County will be responsible for the long term care of the facility in perpetuity. Because this is a vertical expansion, Vernon County will continue with in-payments to the long-term care account in accordance with the long term care requirements in NR 520.06(6), Wis. Adm. Code.

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL PLAN OF OPERATION APPROVAL
FOR
VERNON COUNTY BALEFILL LANDFILL
VERTICAL EXPANSION,

VERNON COUNTY, WISCONSIN
LICENSE # 3268

FINDINGS OF FACT

The Department finds that:

1. On July 20, 1992 the Department issued a Conditional Plan of Operation Approval for the active Vernon County Balefill Landfill.

2. Vernon County has proposed to construct a vertical expansion of their Municipal Solid Waste (MSW) Balefill landfill. The facility would be located in the NW ¼ of the SE ¼, NE ¼ of SW 1/4, SE ¼ of SW ¼ and the SW ¼ of SE ¼ in Section 15, T 13N, R4W, Town of Viroqua, Vernon County, Wisconsin.

3. The proposed vertical expansion of the facility is intended to serve the needs of Vernon County exclusively. Materials disposed at this site will consist of municipal solid waste from residential and commercial sources and non-hazardous industrial waste. The vertical expansion of the landfill would have a design capacity of 275,000 cubic yards with a total capacity of 590,000 cubic yards. The proposed expansion will add approximately eight years of operational life for the facility. The anticipated closing date for the facility is approximately 2017.

4. The Department made an initial site inspection of the proposed vertical expansion site on May 22, 2002.

5. On June 28, 2004 the Department made a favorable feasibility determination for the proposed vertical expansion of the Vernon County Balefill Landfill. As part of the determination exemptions were given for the following items:
    a. 1200 ft setback for private wells,
    b. PAL or Enforcement Standard exceedances at a MSW landfill,
    c. The required number of piezometers,
    d. Required number of hydraulic conductivity tests,
    e. Required number of monitoring wells,
    f. Required number of gas probes,
    g. Required number of soil borings.

6. On February 11, 2005 the Department's La Crosse Service Center received the report titled "Plan of Operation for Vertical Expansion Vernon County Sanitary Balefill License No 3268." On February 22, 2005 the Department received a payment of $7700 for invoice #7609, which is the Plan of Operation review fee. The report was prepared by Central Wisconsin Engineers and included 31 plan sheets.

7. On March 14, 2005 the Department issued a notice of incompleteness for the February 11, 2005 Plan of Operation submittal

8. On April 1, 2005 the Department received a response to the Notice of Incompleteness from Central Wisconsin Engineer which was dated March 25, 2005.

9. The information submitted in connection with the plan of operation review includes the following:

   a. A report entitled "Plan of Operation for Vertical Expansion Landfill, Vernon County Sanitary Balefill." The report, which was prepared by Central Wisconsin Engineers, included 31plan sheets and was dated January 2005.

   b. An August 13, 2004 electronic mail from Peter Arntsen of Central Wisconsin Engineers regarding gas monitoring wells at the Vernon County Balefill facility.

   c. A memorandum, dated March 9, 2005 from Brian Kalvelage to Marty Herrick and Dave Lundberg regarding additional information that should be provided with respect to environmental monitoring and the Plan of Operation Report.

   d. On March 14, 2005 the Department requested additional information for the review of the plan of operation for the proposed vertical expansion of the Vernon County Balefill Landfill. On April 1, 2005, on behalf of Vernon County, Central Wisconsin Engineers provided a response to the Department's letter. The response included a narrative, additional groundwater data and revised plan sheets.

   e. On June 10, 2005 Brian Kalvelage and Martin Herrick of the Department inspected the Vernon County Balefill facility.

   f. On June 21, 2005 Martin Herrick of the Department notified Gail Frie, the Vernon County Solid Waste Manager that if the facility were to use total closure costs for the worst case closure requirement, they will have to add additional funds to the account.

   g. On June 30, 2005 the Department sent an electronic mail rough draft of the proposed plan of operation approval to Gail Frie of Vernon County.

   h. On June 30, 2005 Gail Frie of Vernon County sent a letter to the Department requesting the review time for the Plan of Operation Submittal be extended until August 1, 2005.

   i. On July 14, 2005 Central Wisconsin Engineers submitted revised worst case closure costs to the Department.

   j. On July 21, 2005 a conference call was held between Vernon County, the Department and Central Wisconsin Engineers to discuss the draft plan of operation approval.

   k. On July 21, 2005 Central Wisconsin Engineers submitted a spreadsheet via email which contained revised ACL calculations. No revised PAL calculations were provided.

l. On July 27, 2005 Central Wisconsin Engineers on behalf of Vernon County submitted additional information in response to the July 21, 2005 conference call discussing the facility's proposed plan of operation.

10. Additional documents considered in the review of the Plan of Operation include the following:

a. Quarterly monitoring results for the Vernon County Balefill facility

b. The June 28, 2004 WDNR Feasibility Determination for the Proposed Vertical Expansion of the Vernon County Balefill Landfill.

c. The application materials for the Vernon County Balefill permit for the Department's Air Management Program.

d. WDNR internal guidance document number # Wa47.doc dated February 2, 2004. This written guidance is entitled, "Interim Guidance Addressing the 1200-foot Setback Between Proposed Landfills and Existing Water Supply Wells."

e. WDNR internal guidance document number #Wa026.doc dated September 9, 2002. This written guidance is entitled, "Solid Waste Technical Guidance-PAL/ACL Calculations."

f. A June 3, 2005 a facsimile from Central Wisconsin Engineers to Brian Kalvelage of the Department regarding leachate generation data.

g. An internal WDNR memo dated June 8, 2004 from Mike Lemcke of the Drinking and Groundwater Program to Dave Lundberg of the Waste Management Program regarding concurrence with proposed exemptions to NR 140.28, Wis. Adm. Code, for construction of a landfill (expansion) in a location where NR 140, Wis. Adm. Code, groundwater standards have been exceeded.

h. Internal WDNR memo dated June 9, 2004 from Randell Clark of the Drinking and Groundwater Program to Brian Kalvelage of the Waste Management Program regarding concurrence with the proposed exemption to NR 504.04(3)(f), Wis. Adm. Code, for placement of waste within 1,200 feet of a public or private water supply well.

i. Information provided by the Department's Drinking and Groundwater Program on March 10, 2004 informing other WDNR programs that NR 140 Wis. Adm. Code has been revised to include lower groundwater standards for Arsenic. This information indicated that the preventive action limit (PAL) and enforcement standard (ES) for Arsenic has been lowered to 1 ug/l and 10 ug/l respectively. According to this information the effective date for these new standards was March 1, 2004.

j. Internal WDNR guidance document entitled, "Reducing or Terminating Groundwater Monitoring at Solid Waste Facilities", dated January 8, 2003. This guidance was used to eliminate COD sampling from the environmental monitoring plan.

11. Additional facts relevant to the review of the plan of operation include:

a. The proposed alignment of the leachate collection lines minimizes friction and other impediments to complete insertion of cleanout hoses and video inspection hardware.

b. The potential effects of a landfill on groundwater quality are minimized by use of efficient leachate collection designs, where highly permeable drain layers reduce the head of leachate on the liner and, in consequence, significantly reduce leakage rates though any potential defects in geomembrane components of liners.

12. The Plan of Operation Report did not include PALs for indicator parameters to groundwater standards. Instead, Department staff calculated specific PAL values for certain parameters at specific monitoring points. Only electronic data from WDNR's GEMs Database was used to calculate these values. Vernon County is required to submit all monitoring data in an electronic format that is uploadable to the GEMs database. Table 1A (attached) contains these respective PAL calculations. Vernon County may submit additional electronic data to support additional PAL calculations (or changes to existing calculated values). This data shall be submitted and reviewed using the plan modification process.

13. The Plan of Operation Report did not include Alternative Concentration Limits (ACLs) to groundwater standards. However, the March 25, 2005 additional information submittal contained ACL calculations for two parameters (Manganese and Nitrate+Nitrite) at six monitoring wells. Department staff calculated specific ACL values for certain parameters at specific monitoring points. Only electronic data from WDNR's GEMs Database was used to calculate these values. Vernon County is required to submit all monitoring data in an electronic format that is uploadable to the GEMs database. Table 1B (attached) contains these respective ACL calculations. Vernon County may submit additional electronic data to support additional ACL calculations (or changes to existing calculated values). This data shall be submitted and reviewed using the plan modification process.

14. The Department considered the following information while reviewing the need for exemptions to groundwater standards at this facility:

a. Baseline groundwater monitoring data provided in the Feasibility Report, Addenda to the Feasibility Report, the Plan of Operation Report (and addenda).

b. Information provided to the Department indicating regional groundwater flow beneath the site is in a North/Northeast direction towards Seas Branch Creek. A perched water table also exists across the site and generally flows south.

c. Information provided by the Department's Drinking and Groundwater Program on March 10, 2004 informing other WDNR programs that NR 140; Wis. Adm. Code had been revised to include lower groundwater standards for Arsenic. This information indicated that the PAL and ES for Arsenic have been lowered to 1 ug/l and 10 ug/l respectively. According to this information the effective date for these new standards was March 1, 2004.

d. Internal WDNR memo dated May 17, 2004 from Mike Lemcke of the Drinking and Groundwater Program to Dave Lundberg of the Waste Management Program regarding concurrence with the proposed exemptions to NR 140.28, Wis. Adm. Code, for construction of a landfill in a location where groundwater standards have been exceeded.

e. Well construction details and boring logs provided in the Feasibility Report and Plan of Operation Reports.

f. Well location plan sheets and water table maps provided in the Plan of Operation Report and March 25, 2005 submittal.

g. The landfill design specifications provided in the Plan of Operation Report as conditioned herein.

15. Neither the applicant, nor any person owning a 10% or greater legal or equitable interest in the applicant or in the assets of the applicant:

a. Is in noncompliance with a plan approval or order issued by the Department for a solid or hazardous waste facility in Wisconsin,

b. Owns or previously owned a 10% or greater legal or equitable interest in a person, or in the assets of a person, who is not in compliance with a plan approval or order issued by the Department for a solid or hazardous waste facility in Wisconsin.

16. The Department has complied with the requirements of NR 150, Wis. Adm. Code, and s. 1.11, Stats., and has adopted all practical means to avoid or minimize environmental harm consistent with social, economic and other essential considerations.

17. The conditions set forth below are needed to assure that construction, operation, closure, and monitoring of the Vernon County Balefill are conducted in conformance with NR 500 to 590, Wis. Adm. Code, and modern landfill practice.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.30, Stats. to approve a plan of operation with special conditions if the conditions are needed to ensure compliance with chs. NR 500 to 590, Wis. Adm. Code.

2. The Department has authority under NR 507.18(1) Wis. Adm. Code, to approve and allow certain baseline monitoring results and corresponding PAL/ACL calculations to be submitted in a separate report. This data is normally required in the Plan of Operation Report.

3. The Department has authority under NR 500.08(4), Wis. Adm. Code, to approve exemptions to the requirements of chs NR 500 to 590, Wis. Adm. Code in special cases except as otherwise provided.

4. The Department has the authority under s. NR 140.28, Wis. Adm. Code and ss. 160.19 (8) and (9), Stats., to grant exemptions to groundwater standards and to specify terms and conditions under which the Department may seek remedial action relating to standards for which an exemption has been granted. This may include establishing alternative concentration limits.

5. The Department has the authority under s. 160.15(3), Stats., and s. NR 140.20, Wis. Adm. Code, to establish PALS for indicator parameters.

6. The conditions of approval set forth below are needed to ensure compliance with chs. NR 500 to 590, Wis. Adm. Code.

7. In accordance with foregoing, the Department has the authority under ch. 289, Stats., to issue the following conditional approval.

CONDITIONAL PLAN OF OPERATION APPROVAL

The Department hereby approves the Plan of Operation for the vertical expansion of the Vernon County Balefill Landfill subject to compliance with chs. NR 500 to 590 Wis. Adm. Code and the following conditions:

General

1. All aspects of construction, operation, monitoring and closure of the landfill shall be performed in accordance with the July 20, 1992 Plan of Operation, subsequent plan modification to the July 20, 1992 Plan of Operation Approval, this plan of operation approval and the requirements in the NR 500 to 590, Wis. Adm. Code. Where discrepancies arise between Department approval conditions and the respective Plan of Operations and their associated plan sheets occur, this approval's conditions shall take precedence.

2. Any proposed changes to the plan of operation report or this approval shall be proposed to the Department for review and approval. If the changes are compatible with the desired performance of this landfill, as determined by the Department, a plan modification will be approved accepting those changes. Written Department approval is necessary prior to implementing any changes with the exception of minor field modifications that are documented in accordance with NR 516.04(3)(d), Wis. Adm. Code. All field modifications shall be discussed with the Department prior to implementation. Certain specific changes may be handled as expedited plan modifications under s. NR 514.09, Wis. Adm. Code as appropriate.

3. The Department shall have the right of unannounced entry to the Vernon County Balefill facility for inspection purposes.

Design, Construction, and Operations

4. The design and specifications for the proposed aboveground leachate collection tank shall be submitted for review and approval prior to construction. The design shall include details on proposed capacity, interconnecting to the existing leachate collection system, additional pumps and weather proofing for the existing leachate pumps, and secondary containment. The design shall specify measures to be taken to prevent or contain leakage from the tank and prevent uncontrolled introduction of leachate into the waste mass. The aboveground leachate collection tank and associated equipment design shall be submitted to the Department within 90 days from the date of this approval.

5. Prior to the initial acceptance of demolition waste at the Balefill Landfill, a hot load inspection/storage pad shall be constructed near the active filling area as close as possible but not physically in the waste mass. The design shall include a clay lining and berms to allow for water to be applied to hot load in order to extinguish fires. The design shall also capture the water prior

to being discharged to the site. Details for this design shall be provided to the Department for approval within 90 days from the date of this approval.

6. In addition to the annual leachate collection cleaning required by NR 506.07(5)(c), the following actions shall be taken for leachate collection pipe inspection:

   a. Pipe cleaning shall be conducted after any construction events where the liner or alterations to the leachate collection system have occurred.

   b. All leachate collection lines shall be cleaned with water jet cleanout devices initially after placement of the leachate drain layer using pipe cleaning procedures that insert cleanout devices from each access point to, at a minimum, the toe of the opposite sideslope.

   c. A video camera inspection shall be conducted on all leachate collection pipes after the initial pipe cleaning activities and at 5 year intervals, following the annual pipe cleaning. The video camera inspection shall extend a minimum of 300 feet onto the base grades of each new leachate collection line and as practicable for existing leachate lines.

   d. All blockages of leachate collection pipes, pipe breaks or any impedance to passage of pipe cleaning equipment shall be investigated, defined and a remediation proposed for review and approval by the Department.

7. The secondary containment system for the leachate collection tanks shall be checked monthly.

8. Vernon County shall notify the Department's environmental engineer assigned to this site a minimum of one week prior to beginning each of the construction events listed below, for the purpose of allowing the Department to inspect the work. A construction documentation report shall be submitted in accordance with the requirements in NR 516, Wis. Adm. Code for the liner and final cover construction in the respective cells as noted below. Fees shall be paid to the Department in accordance with s. NR 520.04(5), Wis. Adm. Code for each of the inspections and associated construction documentation reports as noted below.

Construction Events	**(Liner)**	**(Capping)**
Inspections	(1.) Subase & Clay Soil Placement	(1.) Grading Layer & Clay Soil Soil Placement
	(2.) Geomembrane Installation	(2.) Geomembrane Installation
	(3.) Leachate Collection System Components	(3.) Drainage Layer Installation
	(4.) Drainage Blanket	(4.) Rooting Zone & Topsoil Placement

9. If a partial clay liner is constructed prior to freeze up, the completed and tested part of the clay liner shall be covered by a minimum one foot of compacted protective clay, compacted at required density and moisture content but without testing of the protective clay. The following spring, at least the upper six inches of the protective clay layer shall be removed and the upper

to being discharged to the site. Details for this design shall be provided to the Department for approval within 90 days from the date of this approval.

6. In addition to the annual leachate collection cleaning required by NR 506.07(5)(c), the following actions shall be taken for leachate collection pipe inspection:

   a. Pipe cleaning shall be conducted after any construction events where the liner or alterations to the leachate collection system have occurred.

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9. If a partial clay liner is constructed prior to freeze up, the completed and tested part of the clay liner shall be covered by a minimum one foot of compacted protective clay, compacted at required density and moisture content but without testing of the protective clay. The following spring, at least the upper six inches of the protective clay layer shall be removed and the upper

foot of the completed clay liner shall be re-tested for density and moisture at the same locations previously tested. If the tests meet compaction specifications, the upper three inches of the completed clay liner and the remaining protective clay layer shall be scarified and re-compacted. If the tests do not meet compaction specification then the entire lift of protective clay and at least the upper four inches of the clay liner shall be removed and the second foot of the clay liner shall be re-tested for density and moisture at the same locations previously tested. If the tests meet compaction specifications, the remaining eight inches of the upper foot of the clay liner shall be scarified and re-compacted. If the tests do not meet compaction specifications, then the procedure shall be repeated for the remaining depth of clay liner until compaction specifications are met.

10. Written Department approval shall be obtained prior to the disposal of fertilizers containing oxidizing agents at the Vernon County Balefill Landfill.

11. Construction and demolition waste shall not be placed below any baled waste.

12. The proposed surface water management system shall be revised to include the following additional items:

    a. Two additional water retention/check structures up gradient of the exiting sedimentation basin shall be included in the design and submitted to the Department for approval prior to construction.

    b. All of the sedimentation basins shall be dredged every three years or sooner if needed or if required by the Department. If sediment in the basins has collected contact water from the landfill the material shall be characterized and managed accordingly.

13. Vernon County shall implement measures to abate odors from waste exhumed below the interim cover areas.

Environmental Monitoring

14. Vernon County shall perform environmental monitoring during the active site life and following closure in accordance with the attached Environmental Monitoring Summary, Tables 1A, 1B, and 2A-2E. All environmental monitoring data shall be reported as required in the Department's electronic format. Monitoring schedules shall comply with the following:

    a. Quarterly monitoring shall be conduced in March, June, September and December.

    b. Semi-annual environmental monitoring shall be conducted in March and September.

    c. Annual monitoring shall be conducted in September.

    d. Monthly monitoring results shall be submitted with semi-annual monitoring data.

15. Vernon County shall conduct environmental monitoring for groundwater quality as specified in the attached Environmental Monitoring Summary in Tables 1A, 1B and 2A-2E and using the PALs and ACLs which are established in Tables 1A and 1B, respectively. PALs and ES (Enforcement Standards) for all other substances shall be as specified in ch. NR 140, Wis. Adm.

Code. When submitting monitoring data to the Department, Vernon County shall compare the groundwater sampling results with the aforementioned standards to determine whether exceedances have occurred.

16. For new or replacement wells for groundwater quality monitoring, eight baseline monitoring samples shall be collected at least 30 days apart, but no more than 90 days apart, for the first two years following installation.

17. Vernon County shall collect water supply well samples in accordance with s. NR 507.20(1), Wis. Adm. Code and the Waste Management program guidance document entitled "Monitoring Water Supply Wells For VOCs Around Solid Waste Disposal Facilities [chs.]NR 507.19 and NR 507.20., Wis. Adm. Code." Vernon County shall collect samples at any private well that is required to be sampled as part of the monitoring schedule and analyze them for the compounds listed in Appendix 1. The maximum detection limits for SDWA compounds included in Appendix 1 and identified in the column labeled "NR 809 Status" shall be:

Vinyl Chloride	0.3 ug/L
EDB	0.1 ug/L
DBCP	0.3 ug/L
All other SDWA VOCs	0.5 ug/L

If the following VOCs are not detected, their Limits of Quantitation shall not exceed their respective Preventive Action Limits (listed in Appendix 1):

Acetone
Carbon Disulfide
Fluorotrichloromethane
Tetrahydrofuran
1,2 - Dichlorobenzene
Methyl ethyl ketone
Methyl isobutyl ketone

18. Vernon County shall submit a report to the Department on the construction and sampling history of MW-1P and MW-5. This report shall evaluate the usefulness of these monitoring points and propose abandonment and/or replacement and for these two monitoring points. At a minimum, the report shall include well construction details, geology and hydrogeology, sampling history and results, applicable correspondence, and any other supporting documentation. This report shall be submitted to the Department within 90 days from the date of this approval. Written Department approval must be obtained prior to any monitoring well abandonment.

19. Vernon County and its successors and assigns shall be responsible for site maintenance, monitoring, and any necessary remedial activities identified by the Department.

20. A laboratory certified or registered under s. 299.11 Stats shall conduct all chemical and physical analysis required by the above conditions and Ch. NR 149, Wis. Adm. Code where applicable.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

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Mr. Gail Frie
Vernon County Balefill Landfill
Plan of Operation Approval

07/29/2005

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes, administrative codes and case law establish time periods and requirements for reviewing Department decisions.

To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats. establish criteria for filing a petition for judicial review. Such a petition shall be filed with the appropriate circuit court and shall be served on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: July 29, 2005

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

David R. Lundberg
Waste Program Manager
West Central Region

Brian Kalvelage /DL
Brian Kalvelage
Hydrogeologist
West Central Region

Martin Herrick /DL
Martin Herrick, P.E.
Environmental Engineer
West Central Region

07/29/2005

Mr: Gail Frie
Vernon County Balefill Landfill
Plan of Operation Approval

ENVIRONMENTAL MONITORING SUMMARY
VERNON COUNTY BALEFILL – LICENSE # 3268

Table 1A
(Preventive Action Limits (PALs)-Indicator Parameters)**

Substance/Parameter	Monitoring Point/Well	PAL value (mg/l)
Alkalinity	MW-1RZ	310
	MW-13P	300
	MW-14	320
	MW-14Z	330
COD	Not applicable	Not applicable
Field Conductivity (specific conductance, umho/cm)	MW-1RZ	720
	MW-13P	630
	MW-14	use NR 140.20 value
	MW-14Z	760
Hardness	MW-1RZ	350
	MW-13P	310
	MW-14	330
	MW-14Z	380

Table 1B
(Alternative Concentration Limits (ACLs)-Public Health and Welfare Parameters)**

Substance/Parameter	Monitoring Point/Well	ACL value (mg/l)
Iron	MW-1PR	.34
	MW-1R	.13
	MW-3	.6
	MW-5A	.52
	MW-7	.37
	MW-9	1.2
	MW-12	.34
	P-1	.76
Chloride	MW-1RZ	Baseline sampling indicated no results greater than the NR 140 PAL value.
	MW-13P	
	MW-14	
	MW-14Z	
Fluoride	MW-2	2.1
	MW-2P	1.5
	MW-3	1.5
	MW-4P	1.8
	MW-5A	1.6
	MW-6	1.4
	MW-8R	1.5
	MW-11	2.5
	MW-12	1.6
Manganese	MW-5A	70 ug/L
	MW-6	56 ug/l
	MW-7	49 ug/L

ENVIRONMENTAL MONITORING SUMMARY
VERNON COUNTY BALEFILL – LICENSE # 3268

Table 1A
(Preventive Action Limits (PALs)-Indicator Parameters)**

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	MW-13P	630
	MW-14	use NR 140.20 value
	MW-14Z	760
Hardness	MW-1RZ	350
	MW-13P	310
	MW-14	330
	MW-14Z	380

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	MW-12	.34
	P-1	.76
Chloride	MW-1RZ MW-13P MW-14 MW-14Z	Baseline sampling indicated no results greater than the NR 140 PAL value.
Fluoride	MW-2	2.1
	MW-2P	1.5
	MW-3	1.5
	MW-4P	1.8
	MW-5A	1.6
	MW-6	1.4
	MW-8R	1.5
	MW-11	2.5
	MW-12	1.6
Manganese	MW-5A	70 ug/L
	MW-6	56 ug/l
	MW-7	49 ug/L

CWE, Inc. 5707 Schofield Avenue, P.O. Box 107, Weston, WI 54476-0107 Toll Free: (800) 261-5707
Phone: (715)359-9400 Fax: (715)355-4199 Email: general@cwengineers.com Web: www.cwengineers.com

September 3, 2009

COPY : Dave D.

Mr. Martin Herrick, P.E.
Environmental Engineer
WDNR West Central Region
La Crosse Service Center
3350 Mormon Coulee Road
La Crosse, WI 54601

Re: **Vernon County Balefill**
FID 663038310
License No. 3268
CWE Project # 94602000

Subject: **Initial Site Inspection for Proposed Clay Borrow Source**

Dear Mr. Herrick:

The Vernon County Balefill (License No. 3268) will eventually require additional clay material to complete the construction of its vertical expansion. In anticipation of that need, CWE, Inc., has identified a potential clay borrow source on the same property where the balefill is located (see enclosed Site Location Map). The purpose of this letter is to request an initial site inspection of this property to evaluate its potential for use as a borrow source. We would appreciate knowing the date on which this inspection will take place, once you have scheduled it.

If you have any questions about this project, please contact Gene Edwards, the Vernon County Balefill Manager, at 608-634-2900 or me at 715-359-9400.

Sincerely,
CWE, Inc.

Hooshang Zeyghami, M.S., P.E., D.E.E.
Chief Engineer

Enclosure: Site Location Map

cc: Mr. Gene Edwards, Solid Waste Manager, Vernon County Solid Waste/Recycling Facility, S3705 CTH LF, Viroqua, WI 54665

Celebrating 25 years of service

CWE, Inc. 5707 Schofield Avenue, P.O. Box 107, Weston, WI 54476-0107 Toll Free: (800) 261-5707
Phone: (715)359-9400 Fax: (715)355-4199 Email: general@cwengineers.com Web: www.cwengineers.c

March 15, 2010

COPY

Mr. Martin Herrick, P.E.
Environmental Engineer
WDNR West Central Region
LaCrosse Service Center
3350 Mormom Coulee Road
LaCrosse, WI 54601

Re: **Vernon County Balefill**
FID 663038310
License No. 3268
CWE Project 94602000

Subject: **Additional Information for the Initial Site Inspection for Proposed Clay Borrow Source**

Dear Mr. Herrick:

The Vernon County Balefill (License No. 3268) will eventually require additional clay material to complete the construction of its vertical expansion. In anticipation of that need, CWE, Inc., has identified a potential clay borrow source on the same property where the balefill is located (see enclosed Site Location Map). The process governing the development of clay borrow sources specified in s. NR 504.075 requires the Department first conduct an initial site inspection. CWE, Inc. requested an initial site inspection in September 2009, and that inspection was performed on October 15, 2009. However, the initial site inspection request letter did not include some of the items listed under s. 509.04(4) as is required by s. NR 509.04(5). The purpose of this letter is to provide that information so that the Department can render a preliminary decision on the suitability of this proposed borrow site.

s. NR 509.04(4)(a)

The proposed clay borrow source is located on the same property as the balefill (see Figure 1). The portion of the property under consideration encompasses roughly 18 acres along the balefill entrance road from CTH LF. The legal description for this proposed borrow site is as follows:

> The E ½ of the NW ¼ of the NW ¼ all in Section 22 of Township 13 North, Range 4 West, in the Town of Viroqua, Vernon County, Wisconsin.

At present the proposed borrow site is used for agriculture, and land use within one mile of this property is also primarily agricultural, either as crop land or pasture. Land immediately to the northeast is used for the disposal of municipal solid waste, and land farther to the northeast is wooded and used for timber and private hunting.

s. NR 509.04(4)(b)

When feasibility studies were undertaken for the Vernon County Sanitary Balefill (1990) and its vertical expansion (2003), the Department's Bureau of Endangered Resources reported that no endangered resources or environmentally unique areas occur within Section 22, T13N, R4W, and the State Archaeologist indicated that there are no archaeological or historical sites known to occur on or near this property. The Vernon County Solid Waste Management Plan (2002) states that there are no scientific or natural areas, State parks, or County forest lands within several miles of the property under consideration.

s. NR 509.04(4)(d)

The proposed clay borrow source is situated near the top of a ridge that separates Seas Branch from an intermittent tributary stream (see Figure 2). There are no permanent surface water features at the site. The natural topography directs runoff to the east towards an intermittent stream that ultimately enters Seas Branch. Seas Branch is the only stream within one mile of the site that has a floodplain (see Figure 3).

There are no wetlands within one mile of the proposed site, but springs sometimes occur along valley walls of the larger streams. One such spring (Crume Spring) occurs less than 1,500 feet north of the northernmost property boundary, across the Seas Branch valley. These springs are a result of perched groundwater reaching the land surface along permeable shale beds that occur within the Prairie du Chien Group, a primarily dolomitic bedrock.

Figure 2 also shows the existing residences and water supply wells that are located within one mile of the site.

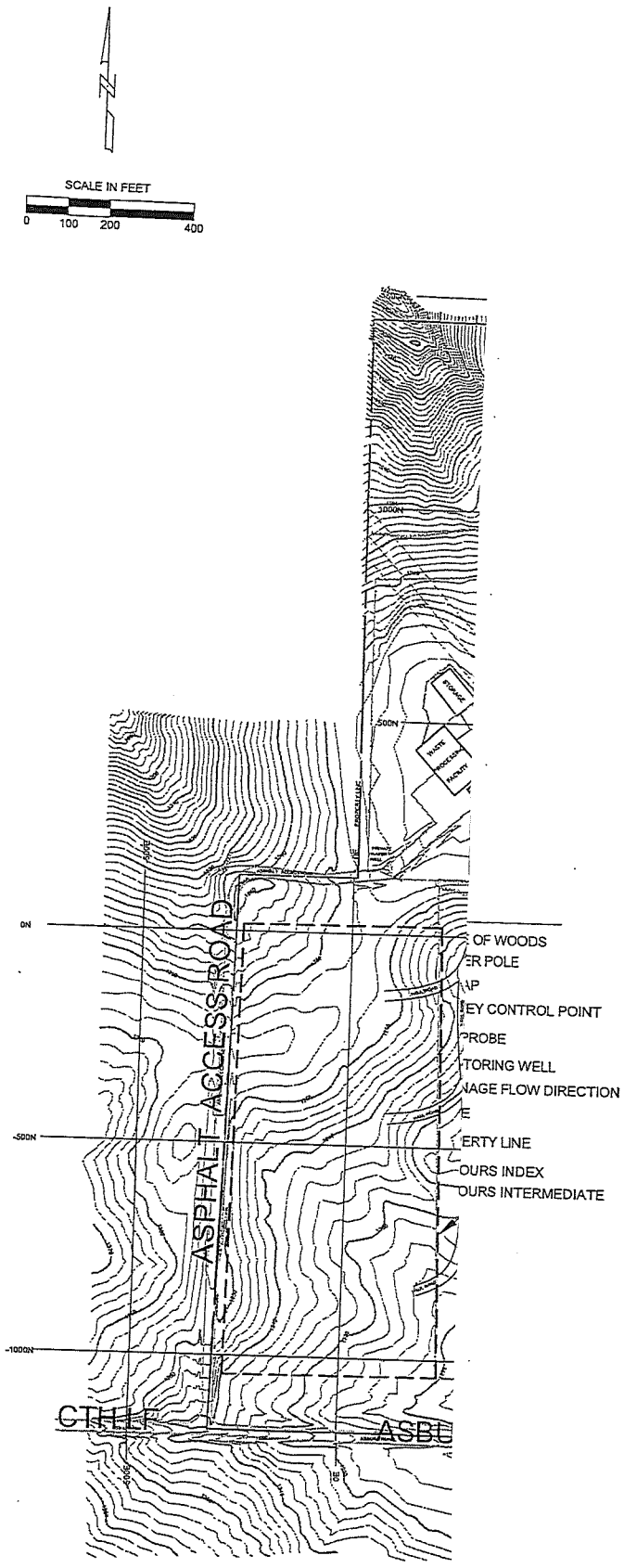
I trust that the information provided in this letter will allow the Department to render a preliminary decision on the suitability of this proposed clay borrow site. If you have any questions about this project, please contact Gene Edwards, the Vernon County Balefill Manager, at 608-634-2900 or me at 715-359-9400.

Sincerely,
CWE, Inc.

Hooshang Zeyghami, M.S., P.E., D.E.E.
Chief Engineer

Enclosures: Figure 1: Site Location Map
Figure 2A, 2B: USGS Topographic Map
Figure 3: FEMA FIRM

cc: Mr. Gene Edwards, Solid Waste Manager, Vernon County Solid Waste/Recycling Facility, S3705 CTH LF, Viroqua, WI 54665



CWE, Inc.
5707 SCHOFIELD AVE.
WESTON, WISCONSIN
54476
PHONE: (715) 359-9400
FAX: (715) 355-4199
general@cwengineers.com
www.cwengineers.com

PROJECT:

SITE LOCATION MAP
VERNON COUNTY SANITARY BALEFILL
CLAY BORROW SITE
PLAN MODIFICATION

REVISIONS:

PROJECT NO: 94602000

DRAWN BY: D.H.

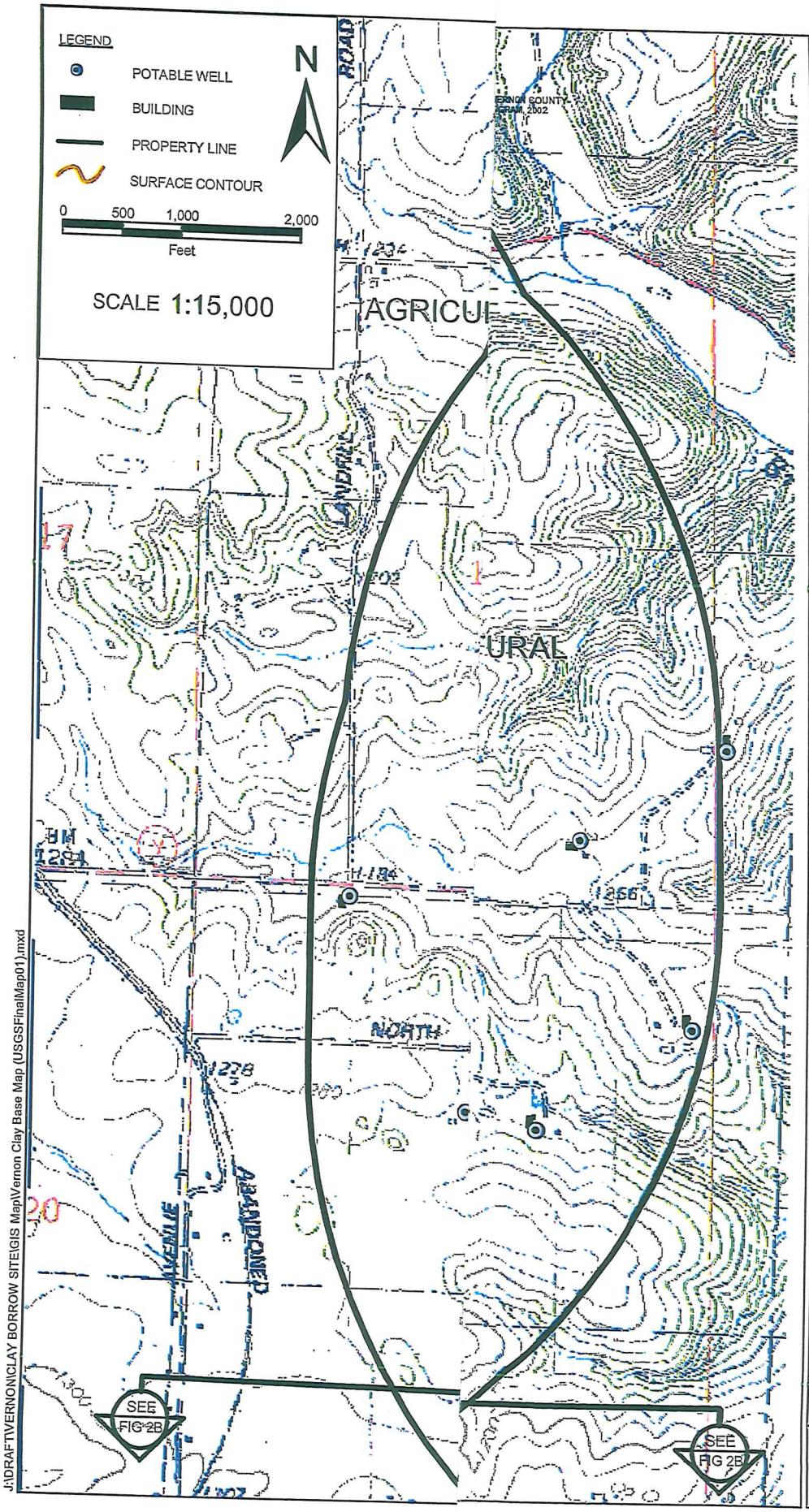
CHECKED BY: S.T.

APPROVED BY: H.Z.

DATE: 8/09

SHEET: Figure 1

J:\DRAFT\VERNON\CLAY BORROW SITE\TOTAL SITE.dwg, SITE, 3/15/2010 3:26:04 PM



CWE, Inc.
5707 SCHOFIELD AVE.
WESTON, WISCONSIN
54476
PHONE:(715)359-9400
FAX:(715)355-4199
general@cwengineers.com
www.cwengineers.com

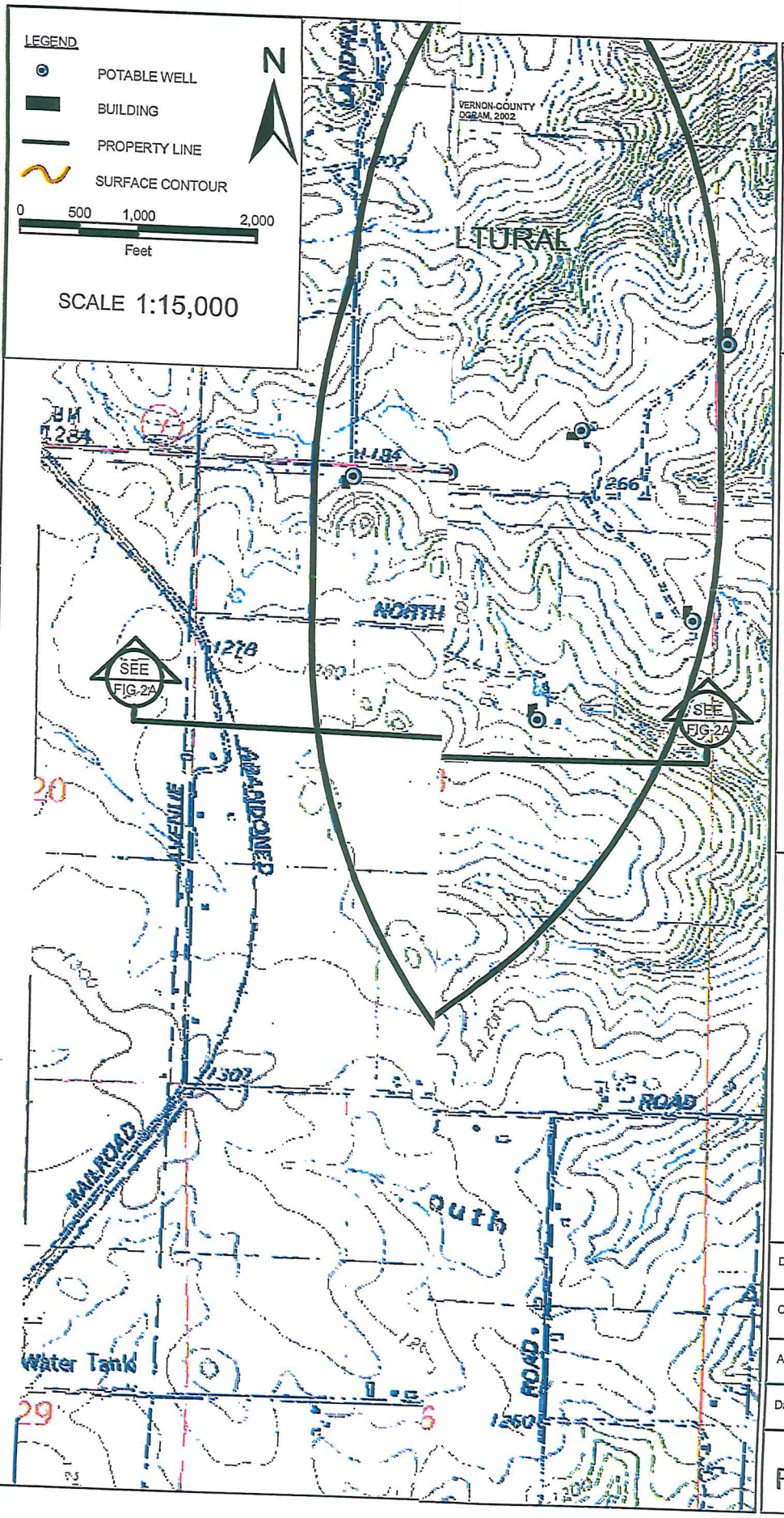
PROJECT:

USGS TOPOGRAPHIC MAP
VERNON COUNTY SANITARY BALEFILL
CLAY BORROW SITE INITIAL SITE INSPECTION

REVISIONS:

Drawn By:	H.S. / S.F.
Checked By:	D.O.
Approved By:	D.O.
Date:	07.18.02 REV. 03.15.10

FIGURE 2A



CWE, Inc.
5707 SCHOFIELD AVE.
WESTON, WISCONSIN
54476
PHONE:(715)359-9400
FAX:(715)355-4199
general@cwengineers.com
www.cwengineers.com

PROJECT:

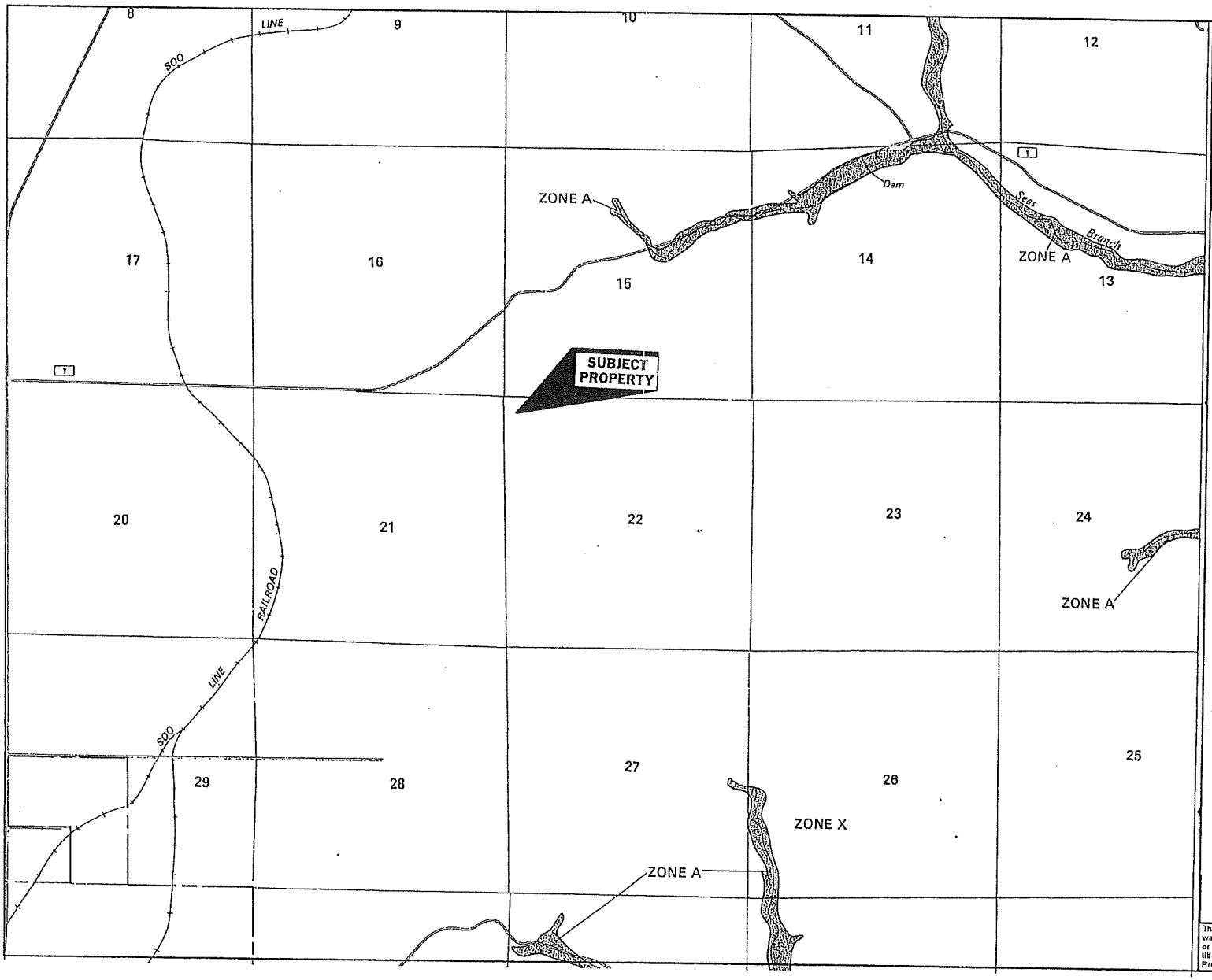
USGS TOPOGRAPHIC MAP
VERNON COUNTY SANITARY BALEFILL
CLAY BORROW SITE INITIAL SITE INSPECTION

REVISIONS:

Drawn By:	H.S./S.F.
Checked By:	D.O.
Approved By:	D.O.
Date:	07.18.02 REV. 03.15.10

FIGURE 2B

J:\DRAFT\VERNON\CLAY BORROW SITE\GIS Map\Vernon Clay Base Map (USGSFinalMap02).mxd



N

APPROXIMATE SCALE IN FEET

2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

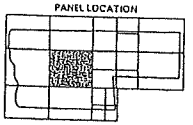
FIRM

FLOOD INSURANCE RATE MAP

VERNON COUNTY, WISCONSIN
(UNINCORPORATED AREAS)

PANEL 150 OF 265
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PANEL LOCATION



COMMUNITY–PANEL NUMBER:
550450 0150 B
MAP REVISED:
NOVEMBER 16, 1990

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCE

Jim Doyle, Governor
Matthew J. Frank, Secretary
Scott A. Humrickhouse, Regional Director

LaCrosse Service Cent
State Office Building Room 1(
3550 Mormon Coulee Roa
LaCrosse, Wisconsin 546(
Telephone 608-785-90(
FAX 608-785-99

May 28, 2010

Mr. Gene Edwards
Vernon County Solid Waste/Recycling Facility
S3705 County Road LF
Viroqua, WI 54601

FID 663038310
APPR File
Vernon Co.

Subject: Initial Site Inspection (ISI), for Soil Borrow Site for Vernon County Sanitary Balefill Landfill, Vernon County, Viroqua Wisconsin, License No. 3268

Dear Mr. Edwards:

This letter is to document the above referenced inspection I performed on October 15, 2009. The purpose of the inspection was to provide the Department's preliminary evaluation of the proposed parcel for location and performance standards under NR 504.04, Wisconsin Administrative Code.

On September 3, 2009 Central Wisconsin Engineer (CWE) submitted a request to the Department to perform an ISI for the Vernon County Sanitary Balefill Site which will be used for the municipal solid waste landfill. On October 15, 2009, Gene Edwards from Vernon County and I met at the proposed site to perform the ISI and review the information included with the ISI request. Vernon County has identified the property located in the Eastern ½ of the NW ¼ of Section 22, Township 13 North, Range 4 West., Town of Viroqua, Vernon County, Wisconsin as a non commercial soil borrow source. During the inspection we also reviewed the information submitted with the ISI request and discussed additional items to be addressed.

Existing land use for the proposed borrow site is agricultural with other agricultural and wooded areas used for timber and private hunting on adjoining properties. As part of the landfill's initial development and subsequent expansion this area was evaluated for endangered resources, wetlands, surface water and environmentally unique areas with none being noted.

On March 2, 2010 the Department requested additional information in order to continue the ISI review. On March 15, 2010 CWE submitted the requested information and an ISI opinion can be rendered.

Based on this information it is the Department's opinion that the soil borrow source meets the locational requirements in NR 504.04, Wis. Adm. Code with the following items being noted:

1. The proposed facility will not be considered to be a commercial borrow source,
2. Their will be multiple borrow events at the site.

If you have any questions regarding this letter, please feel free to contact me at (608) 789-5518.

Sincerely,

Martin Herrick, P.E.
Environmental Engineer
West Central Region

CC: Tom Woletz-WCR
Brian Kalvelage-LAX

MEMO

TO: CWE Project File

FROM: Scott Turner, PE, CWE, Inc

DATE: April 6, 2011

Vernon

RE: Section 7 Endangered Species Act Consultation – Vernon County Sanitary Landfill, Verson County, WI
Sample Documentation Memos are at:
http://www.fws.gov/midwest/endangered/section7/s7process/letters.html

The Vernon County Landfill is proposing to extract clay from a borrow source for use in future landfill construction including liner, intermediate cover, and closure projects. The borrow site is presently farm land and is approximately one quarter of a mile from the active landfill. The location of the borrow site is located in the E ½ of the NW ¼ of the NW ¼ all in Section 22 of Township 13 North, Range 4 West, in the Town of Viroqua, Vernon County, Wisconsin.

The U.S. Fish and Wildlife technical assistance website was carefully reviewed by CWE, Inc. on April 6, 2011, for federally listed threatened and endangered species in Vernon, WI. According to the website, there were three species listed that may be present in Vernon County:

Species	Habitat
1. Higgins Eye Pearly Mussel	Freshwater mussel of larger rivers – Mississippi River
2. Northern Monkshood (flower)	Shaded to partially shaded cliffs, algific talus slopes, or on cool, streamside sites.

The action area for the proposed project is made up of an active landfill and farm field and does not contain any of the habitats of the candidate and endangered species listed above. For these reasons, it is concluded that the Vernon County Sanitary Landfill Projects will have "no effect" on listed species, their habitats, or proposed or designated critical habitat.

Section 7 Endangered Species Act Consultation

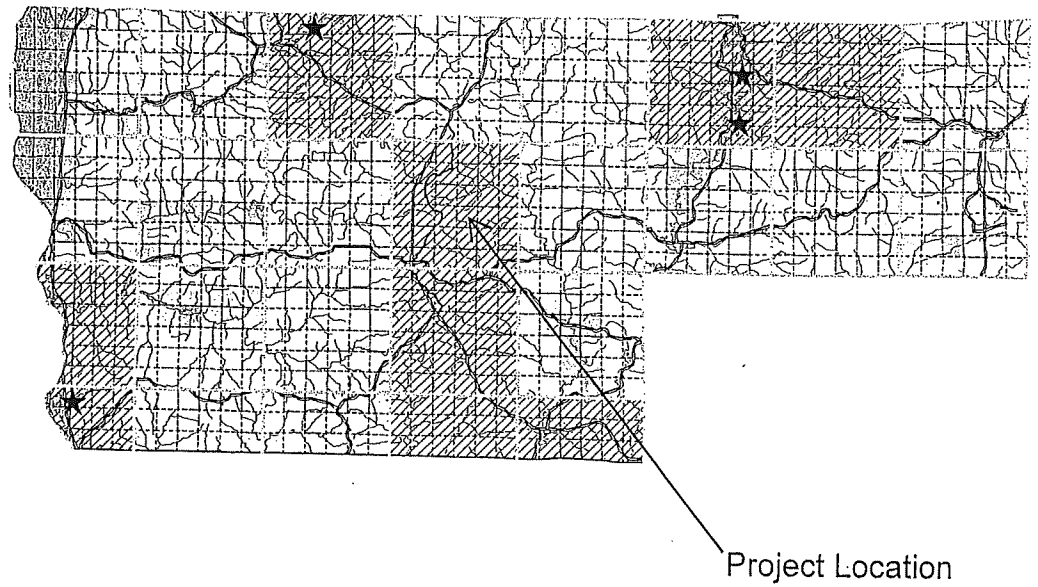
County Distribution of Wisconsin's Federally Threatened, Endangered, Proposed, and Candidate Species

For more information about threatened and endangered species in Wisconsin, please contact:
U.S. Fish & Wildlife Service, 2661 Scott Tower Drive, New Franken, WI 54229 Phone: (920) 866-1717

Wisconsin	Vernon	Higgins' eye pearly mussel *(Lampsilis Higginsi)*	Endangered	Mississippi River
Wisconsin	Vernon	Northern monkshood *(Aconitum noveboracense)*	Threatened	North facing slopes
Wisconsin	Vilas	Canada lynx *(Lynx canadensis)*	Threatened	While no resident populations are known from Wisconsin, the species occasionally occurs in northern forested areas, and counties listed are those with the highest likelihood of occurrence.
Wisconsin	Vilas	Gray wolf *(Canis lupus)*	Endangered	Northern forested areas
Wisconsin	Vilas	Kirtland's warbler *(Dendroica kirtlandii)*	Endangered	Potential breeding in jack pine (5 to 25 years old)
Wisconsin	Walworth	Whooping crane (*Grus americanus*)	Non-essential Experimental Population	Open wetlands and lakeshores
Wisconsin	Walworth	Eastern massasauga *(Sistrurus catenatus catenatus)*	Candidate	Open to forested wetlands and adjacent uplands
Wisconsin	Walworth	Eastern prairie fringed orchid *(Platanthera leucophaea)*	Threatened	Wet grasslands
Wisconsin	Washburn	Canada lynx *(Lynx canadensis)*	Threatened	While no resident populations are known from Wisconsin, the species occasionally occurs in northern forested areas, and counties listed are those with the highest likelihood of occurrence.

Printed 4/6/11

Vernon County



Wisconsin Department of Natural Resources

AQUATIC OCCURRENCES

Animal

Pirate Perch, Aphredoderus sayanus, 1994
Northern Cricket Frog, Acris crepitans, 2006
Rock Pocketbook, Arcidens confragosus, 1979
Blanding's Turtle, Emydoidea blandingii, 2003
Mud Darter, Etheostoma asprigene, 1995
Round Pigtoe, Pleurobema sintoxia, 1979
Washboard, Megalonaias nervosa, 1978
Blue Sucker, Cycleptus elongatus, 1994
Western Sand Darter, Ethestoma clarum, 1995
American Eel, Anguilla rostrata, 1980
Silver Chub, Macrhybopsis storeriana, 1998
Weed Shiner, Notropis texanus, 2008
Lake Sturgeon, Acipenser fulvescens, 1979
Bald Eagle, Haliaeetus leucocephalus, 2002
Paddlefish, Polyodon spathula, 1992
Little Ghost Wing, Pompeius verna, 1997
Worm-eating Warbler, Helmitheros vermivorus, 1978
Red-shouldered Hawk, Buteo lineatus, 1998
Four-toed Salamander, Hemidactylium scutatum, 2004
Higgins' Eye, Lampsilis higginsii, 2009
Louisiana Waterthrush, Seiurus motacilla, 1998
Blunthose Darter, Etheostoma chlorosoma, 1949
Goldeye, Hiodon alosoides, 1994
Wood Turtle, Glyptemys insculpta, 2008
Monkeyface, Quadrula metanevra, 1979
Skipjack Herring, Alosa chrysochloris, 1998
Shoal Chub, Macrhybopsis aestivalis, 1979
Black Buffalo, Ictiobus niger, 1994
Warty back, Quadrula nodulata, 1979
Pallid Shiner, Notropis amnis, 1994
Forster's Tern, Sterna forsteri, 1977
Pugnose Minnow, Opsopoeodus emiliae, 1995
Redside Dace, Clinostomus elongatus, 1979
Longear Sunfish, Lepomis megalotis, 1944
Russet-tipped Clubtail, Stylurus plagiatus, 1992
Greater Redhorse, Moxostoma valenciennesi, 1949

Plants

Drooping Sedge, Carex prasina, 1959
Sweet-scented Indian-plantain, Cacalia suaveolens, 1974

Natural Communities

Hardwood Swamp, Hardwood swamp, 1993
Floodplain Forest, Floodplain forest, 1994
Emergent Marsh, Emergent marsh, 1977
Southern Sedge Meadow, Southern sedge meadow, 1994
Forested Seep, Forested seep, 1994
Southern Hardwood Swamp, Southern hardwood swamp, 1993

TERRESTRIAL OCCURRENCES

Animal

Yellow-billed Cuckoo, Coccyzus americanus, 2009
Upland Sandpiper, Bartramia longicauda, 2004
Ottoe Skipper, Hesperia ottoe, 2003
Prairie Vole, Microtus ochrogaster, 1998
Kentucky Warbler, Oporornis formosus, 1994
Prairie Ring-necked Snake, Diadophis punctatus arnyi, 2006
Western Meadowlark, Sturnella neglecta, 2009
Wild Indigo Dusky Wing, Erynnis baptisiae, 1987
Dot Gloss, Zenoblatta linahitor, 1991
Gray Ratsnake, Pantherophis spiloides, 2008
Bird Rookery, Bird Rookery, 1994
Henslow's Sparrow, Ammodramus henslowii, 2003
Acadian Flycatcher, Empidonax virescens, 2010
Smooth Coil, Helicodiscus singleyanus, 1987
Bat Hibernaculum, Bat Hibernaculum, 1990
Wing Snaggletooth, Gastrocopta procera, 1987
Cherrystone Drop, Hendersonia occulta, 1972
Columbine Dusky Wing, Erynnis lucilius, 1997
Gophersnake, Pituophis catenifer, 2003
Gongora Checker Spot, Chlosyne gongora, 1994
Timber Rattlesnake, Crotalus horridus, 2003
Cerulean Warbler, Dendroica cerulea, 2010
Abbreviated Underwing Moth, Catocala abbreviatella, 1998
Western Harvest Mouse, Reithrodontomys megalotis, 1998
Peregrine Falcon, Falco peregrinus, 2010

Plants

Reflexed Trillium, Trillium recurvatum, 1955
Cliff Cudweed, Gnaphalium obtusifolium var. sarcoli, 2001
One-flowered Broomrape, Orobanche uniflora, 1931
Northern Wild Monkshood, Aconitum noveboracense, 2009
Bird's-eye Primrose, Primula mistassinica, 1939
Purple-stem Cliff-brake, Pellaea atropurpurea, 1978
Nodding Pogonia, Triphora trianthophora, 1999
Glade Fern, Diplazium pycnocarpon, 1978
Rock Stitchwort, Minuartia dawsonensis, 1958
Limestone Oak Fern, Gymnocarpium robertianum, 1935
Musk-root, Adoxa moschatellina, 2002
Yellow Gentian, Gentiana alba, 2000
Roundstem Foxglove, Agalinis gattingeri, 1975
Catfoot, Gnaphalium helleri var. micradenium, 1958
Putty Root, Aplectrum hyemale, 2009
Upland Boneset, Eupatorium sessilifolium var. boltonianum, 1971
Hooker Orchis, Platanthera hookeri, 1970
Lanceolate Bladder Fern, Cystopteris laurentiana, 1977
Shadowy Goldenrod, Solidago sciaphila, 1993
Low Calamint, Calamintha arkansana, 1911
Beak Grass, Diarrhena obovata, 2003
Hill's Thistle, Cirsium hillii, 2002
Oregon Woodsia (Tetraploid), Woodsia oregana ssp. cathcartiana, 1959
Lapland Azalea, Rhododendron lapponicum, 1998
American Gromwell, Lithospermum latifolium, 1930
Marbleseed, Onosmodium molle, 1958
Broad Beech Fern, Phegopteris hexagonoptera, 1985
Rock Chickweed, Paronychia prosphila, 1998

Natural Communities

Hemlock Relict, Hemlock relict, 1995
Dry Prairie, Dry prairie, 1995
Southern Dry-mesic Forest, Southern dry-mesic forest, 2003
Southern Dry Forest, Southern dry forest, 1983
Pine Relict, Pine relict, 1993
Northern Mesic Forest, Northern mesic forest, 1993
Dry Cliff, Dry cliff, 1977
Moist Cliff, Moist cliff, 1998
Southern Mesic Forest, Southern mesic forest, 1994
Northern Dry-mesic Forest, Northern dry-mesic forest, 1977

SPECIES and/or NATURAL COMMUNITY | Aquatic | Terrestrial | Both | Township Occurrences | Watershed Boundaries | State Natural Area

This map represents the known occurrences of rare species and natural communities that have been recorded in the Wisconsin Natural Heritage Inventory (NHI). Colored sections indicate the presence of one or more occurrences within that section. Hatched townships indicate one or more occurrences reported only at the township level. The date following the names above notes the most recent year the occurrence was recorded in the county.

Map generated using NHI data from: 09/15/2010

Copyright 2003, WDNR-Bureau of Endangered Resources
This map may not be reproduced without prior written permission.

WISCONSIN DEPT OF NATURAL RESOURCES

ENDANGERED RESOURCES

PHOTOS OF VERNON COUNTY LANDFILL
PROPOSED CLAY BORROW SITE



(1) View of landfill (center) and proposed clay borrow site looking southwest

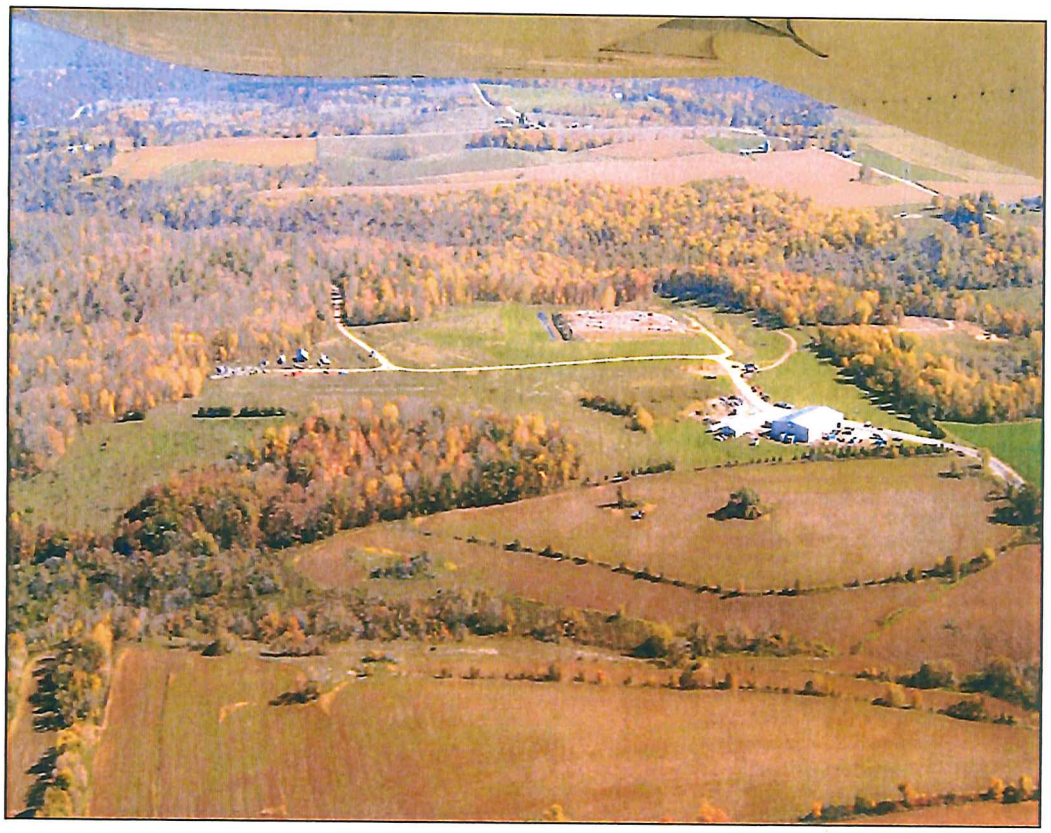


(2) View toward northeast - clay borrow site in foreground and landfill in center

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(3) View toward northeast showing access roads (to be used for clay haul)



(4) View toward east of landfill area and vicinity of borrow site

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Section B-2 WDNR Initial Site Inspection for Clay Borrow Site

September 3, 2009
Letter from Hooshang Zeyghami/CWE
To Mr. Martin Herrick/ WDNR Environmental Engineer
Re: Request for Initial Site Inspection for Proposed Clay Borrow Source

March 2, 2010
Letter from Martin Herrick/WDNR Environmental Engineer
To Mr. Gene Edwards/Vernon County Solid Waste
Re: Request for Information for the Initial Site Inspection for Proposed Clay Borrow Source

March 15, 2010
Letter from Hooshang Zeyghami/CWE
To Mr. Martin Herrick/ WDNR Environmental Engineer
Re: Submittal of Additional Information for the Initial Site Inspection for Proposed Clay Borrow Source

May 28, 2010
Letter from Martin Herrick/WDNR Environmental Engineer
To Mr. Gene Edwards/Vernon County Solid Waste
Re: Compliance Approval of Proposed Clay Borrow Site with Locational Requirements in NR 504.04 Wis. Adm. Code

CWE, Inc. 5707 Schofield Avenue, P.O. Box 107, Weston, WI 54476-0107 Toll Free: (800) 261-5707
Phone: (715)359-9400 Fax: (715)355-4199 Email: general@cwengineers.com Web: www.cwengineers.com

September 3, 2009

COPY : Dave D.

Mr. Martin Herrick, P.E.
Environmental Engineer
WDNR West Central Region
La Crosse Service Center
3350 Mormon Coulee Road
La Crosse, WI 54601

Re: **Vernon County Balefill**
FID 663038310
License No. 3268
CWE Project # 94602000

Subject: **Initial Site Inspection for Proposed Clay Borrow Source**

Dear Mr. Herrick:

The Vernon County Balefill (License No. 3268) will eventually require additional clay material to complete the construction of its vertical expansion. In anticipation of that need, CWE, Inc., has identified a potential clay borrow source on the same property where the balefill is located (see enclosed Site Location Map). The purpose of this letter is to request an initial site inspection of this property to evaluate its potential for use as a borrow source. We would appreciate knowing the date on which this inspection will take place, once you have scheduled it.

If you have any questions about this project, please contact Gene Edwards, the Vernon County Balefill Manager, at 608-634-2900 or me at 715-359-9400.

Sincerely,
CWE, Inc.

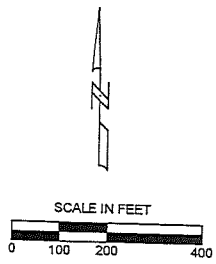
Hooshang Zeyghami, M.S., P.E., D.E.E.
Chief Engineer

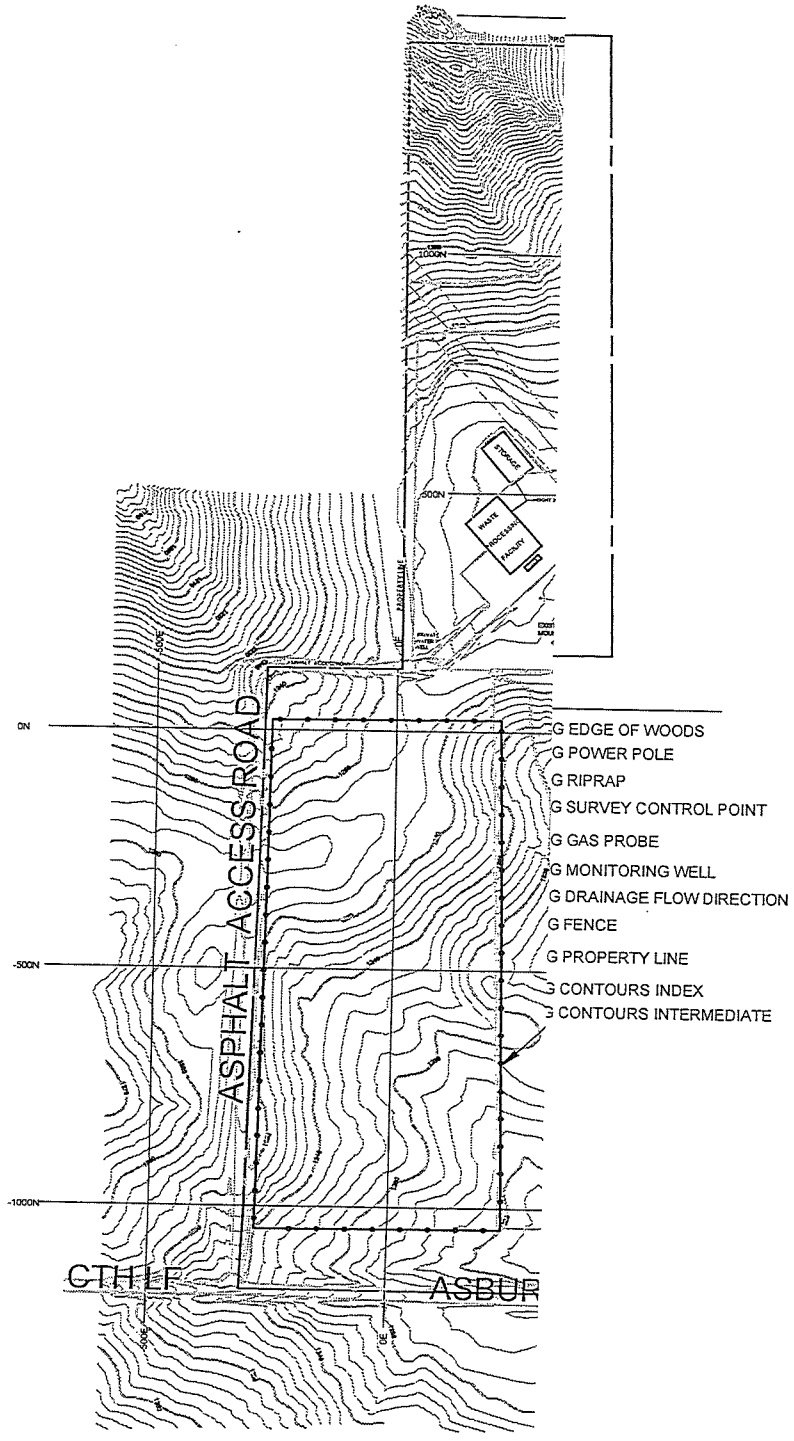
Enclosure: Site Location Map

cc: Mr. Gene Edwards, Solid Waste Manager, Vernon County Solid Waste/Recycling Facility, S3705 CTH LF, Viroqua, WI 54665

I:\LB\Projects\94602000 Vernon County Balefil Vertical Expansion\Corres\ISI Request.doc

Celebrating 25 years of service





CWE, Inc.
5707 SCHOFIELD AVE.
WESTON, WISCONSIN
54476
PHONE: (715) 359-9400
FAX: (715) 355-4199
general@cwengineers.com
www.cwengineers.com

PROJECT:

SITE LOCATION MAP
VERNON COUNTY SANITARY BALEFILL
CLAY BORROW SITE
PLAN MODIFICATION

REVISIONS:

PROJECT NO: 94602000

DRAWN BY: D.H.

CHECKED BY: S.T.

APPROVED BY: H.Z.

DATE: 8/09

SHEET: 1 OF 1

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Mattthew Frank, Secretary
Scott A. Humrickhouse, Regional Director

West Central Region
3550 Mormon Coulee Road
LaCrosse, Wisconsin 54601

COPY

RECEIVED
MAR - 4 2010
HZ 67.7

March 2, 2010

File Ref: 663038310
Vernon County
SW/CORR FILE

Mr. Gene Edwards
Vernon County Solid Waste/Recycling Facility
S3705 County Road LF
Viroqua, WI. 54665

Subject: Request for information for the Initial Site Inspection (ISI) for proposed clay borrow source for the Vernon County Sanitary Balefill, License No. 3268, Vernon County, Viroqua Wisconsin.

Dear Mr. Edwards:

On September 3, 2009 the Department received a request for an initial site inspection for the proposed clay borrow source referenced above. The request was prepared by Central Wisconsin Engineers for the Vernon County Sanitary Balefill Landfill and contained one plan sheet. I performed an initial site inspection for the borrow site on October 15, 2009. In reviewing the request the following items under NR 509.04(5), Wis. Adm.Code, are needed to continue with the review:

a.) The cover letter has to identify the current land use of the proposed borrow site its location by quarter-quarter section.
b.) Identifiy any known potential impacts to endangered or threatened species, historical or archaeological sites and any prior reviews for the initial landfill and its vertical expansion.
d.) A map identifying surface waters, land use, wetlands, flood plains, water supply wells and residences within 1 mile of the site. A larger scale existing conditions map can be used to present the requested information.

Once this information is submitted the Department can render a premliminary opinion on the suitability of the soil borrow site for compliance with the applicable locational criteria and performance standards of s. NR 504.04, Wis. Adm. Code. If you have any questions regarding this request please contact me at (608) 789-5518.

Sincerely,

Martin Herrick, P.E.
Environmantal Engineer
West Central Region

CC: Tom Woletz -WCR
Hooshang Zeyghami, Central Wisconsin Engineers, 5707 Schofield Avenue, PO Box 107, Weston WI 54476-0107

CWE, Inc. 5707 Schofield Avenue, P.O. Box 107, Weston, WI 54476-0107 Toll Free: (800) 261-5707
Phone: (715)359-9400 Fax: (715)355-4199 Email: general@cwengineers.com Web: www.cwengineers.com

March 15, 2010

COPY

Mr. Martin Herrick, P.E.
Environmental Engineer
WDNR West Central Region
LaCrosse Service Center
3350 Mormom Coulee Road
LaCrosse, WI 54601

Re: **Vernon County Balefill**
FID 663038310
License No. 3268
CWE Project 94602000

Subject: **Additional Information for the Initial Site Inspection for Proposed Clay Borrow Source**

Dear Mr. Herrick:

The Vernon County Balefill (License No. 3268) will eventually require additional clay material to complete the construction of its vertical expansion. In anticipation of that need, CWE, Inc., has identified a potential clay borrow source on the same property where the balefill is located (see enclosed Site Location Map). The process governing the development of clay borrow sources specified in s. NR 504.075 requires the Department first conduct an initial site inspection. CWE, Inc. requested an initial site inspection in September 2009, and that inspection was performed on October 15, 2009. However, the initial site inspection request letter did not include some of the items listed under s. 509.04(4) as is required by s. NR 509.04(5). The purpose of this letter is to provide that information so that the Department can render a preliminary decision on the suitability of this proposed borrow site.

s. NR 509.04(4)(a)

The proposed clay borrow source is located on the same property as the balefill (see Figure 1). The portion of the property under consideration encompasses roughly 18 acres along the balefill entrance road from CTH LF. The legal description for this proposed borrow site is as follows:

> The E ½ of the NW ¼ of the NW ¼ all in Section 22 of Township 13 North, Range 4 West, in the Town of Viroqua, Vernon County, Wisconsin.

At present the proposed borrow site is used for agriculture, and land use within one mile of this property is also primarily agricultural, either as crop land or pasture. Land immediately to the northeast is used for the disposal of municipal solid waste, and land farther to the northeast is wooded and used for timber and private hunting.

s. NR 509.04(4)(b)

When feasibility studies were undertaken for the Vernon County Sanitary Balefill (1990) and its vertical expansion (2003), the Department's Bureau of Endangered Resources reported that no endangered resources or environmentally unique areas occur within Section 22, T13N, R4W, and the State Archaeologist indicated that there are no archaeological or historical sites known to occur on or near this property. The Vernon County Solid Waste Management Plan (2002) states that there are no scientific or natural areas, State parks, or County forest lands within several miles of the property under consideration.

s. NR 509.04(4)(d)

The proposed clay borrow source is situated near the top of a ridge that separates Seas Branch from an intermittent tributary stream (see Figure 2). There are no permanent surface water features at the site. The natural topography directs runoff to the east towards an intermittent stream that ultimately enters Seas Branch. Seas Branch is the only stream within one mile of the site that has a floodplain (see Figure 3).

There are no wetlands within one mile of the proposed site, but springs sometimes occur along valley walls of the larger streams. One such spring (Crume Spring) occurs less than 1,500 feet north of the northernmost property boundary, across the Seas Branch valley. These springs are a result of perched groundwater reaching the land surface along permeable shale beds that occur within the Prairie du Chien Group, a primarily dolomitic bedrock.

Figure 2 also shows the existing residences and water supply wells that are located within one mile of the site.

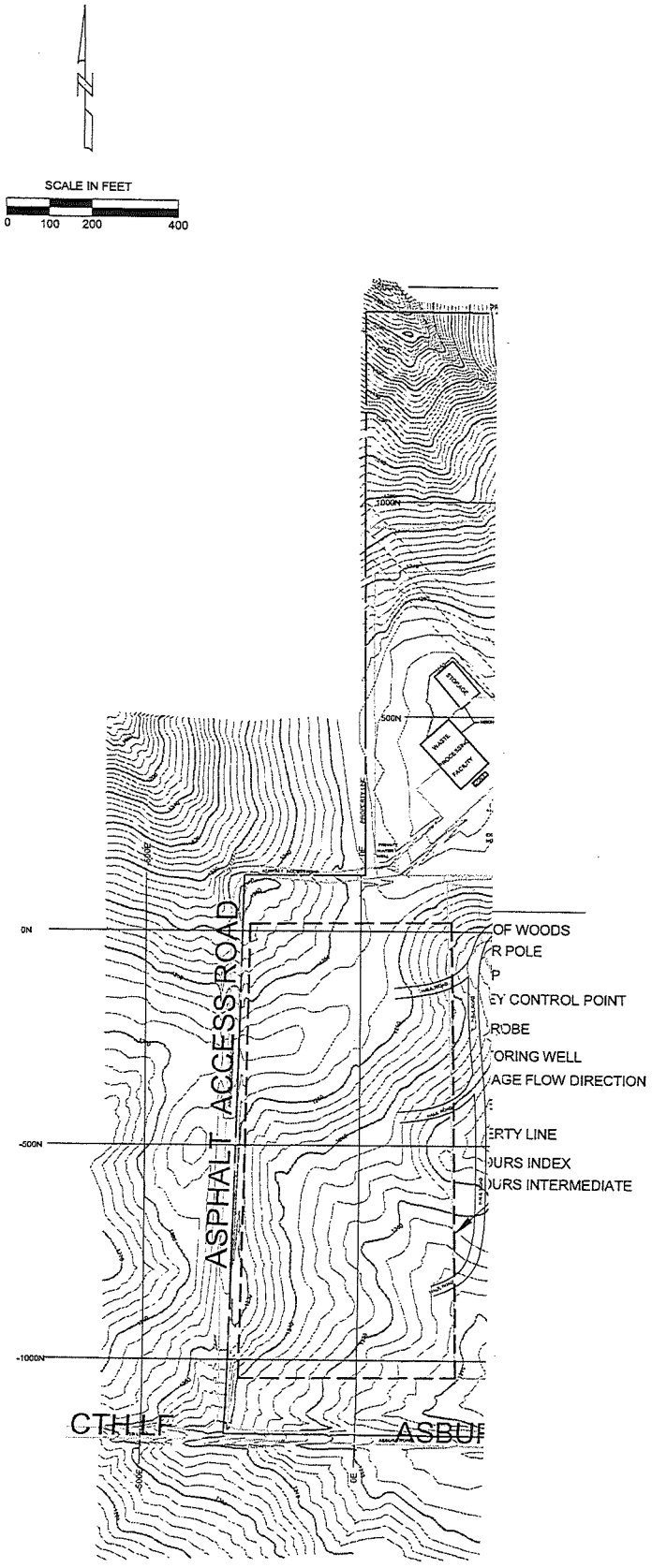
I trust that the information provided in this letter will allow the Department to render a preliminary decision on the suitability of this proposed clay borrow site. If you have any questions about this project, please contact Gene Edwards, the Vernon County Balefill Manager, at 608-634-2900 or me at 715-359-9400.

Sincerely,
CWE, Inc.

Hooshang Zeyghami, M.S., P.E., D.E.E.
Chief Engineer

Enclosures: Figure 1: Site Location Map
Figure 2A, 2B: USGS Topographic Map
Figure 3: FEMA FIRM

cc: Mr. Gene Edwards, Solid Waste Manager, Vernon County Solid Waste/Recycling Facility, S3705 CTH LF, Viroqua, WI 54665



CWE, Inc.
5707 SCHOFIELD AVE.
WESTON, WISCONSIN
54476
PHONE: (715) 359-9400
FAX: (715) 355-4199
general@cwengineers.com
www.cwengineers.com

PROJECT:

SITE LOCATION MAP
VERNON COUNTY SANITARY BALEFILL
CLAY BORROW SITE
PLAN MODIFICATION

REVISIONS:

PROJECT NO: 94602000

DRAWN BY: D.H.

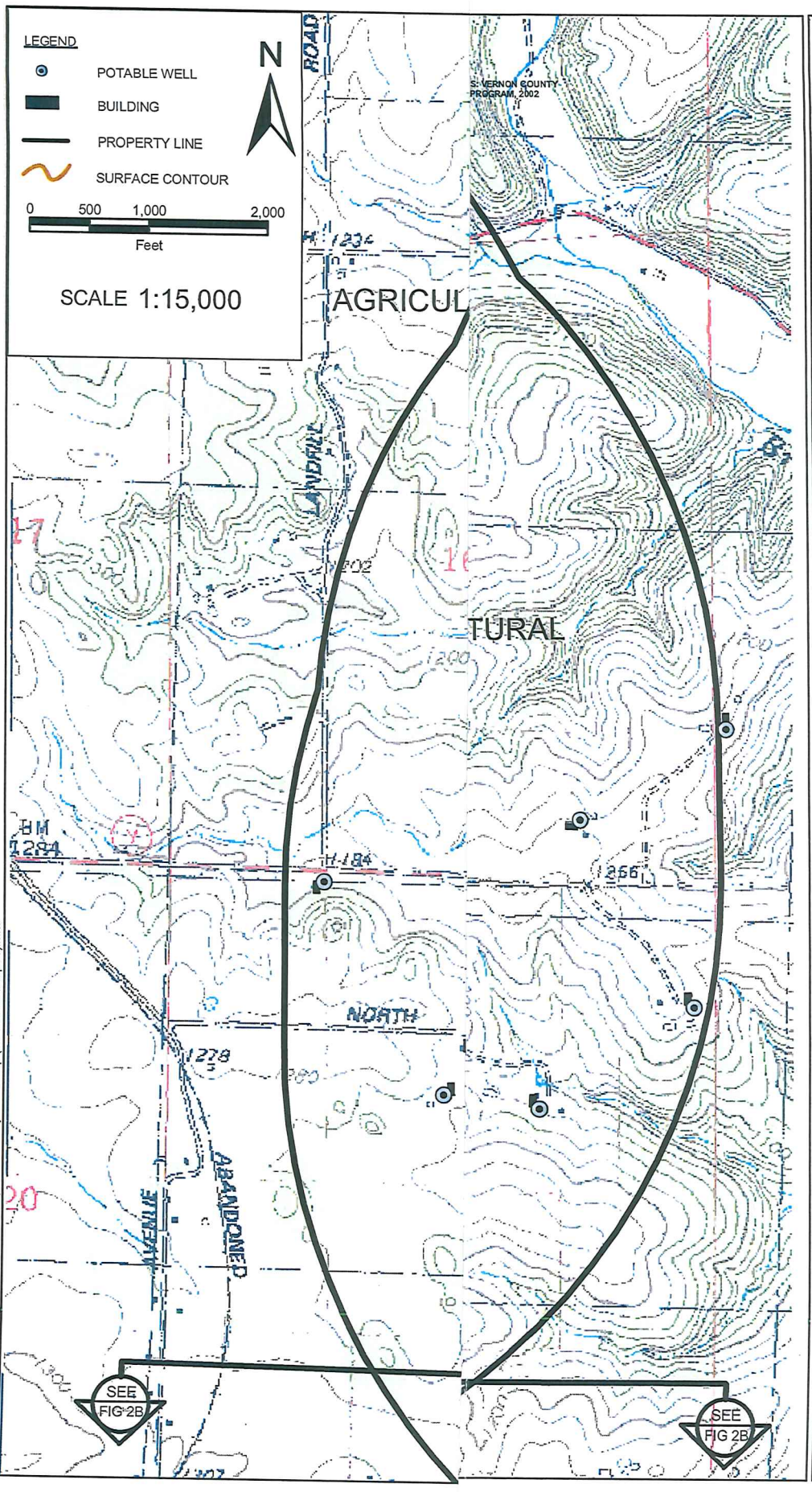
CHECKED BY: S.T.

APPROVED BY: H.Z.

DATE: 8/09

SHEET: Figure 1

J:\DRAFT\VERNON\CLAY BORROW SITE\TOTAL SITE.dwg, SITE, 3/15/2010 3:26:04 PM



J:\DRAFT\VERNON\CLAY BORROW SITE\GIS Map\Vernon Clay Base Map (USGSFinalMap01).mxd

CWE, Inc.
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WESTON, WISCONSIN
54476
PHONE:(715)359-9400
FAX:(715)355-4199
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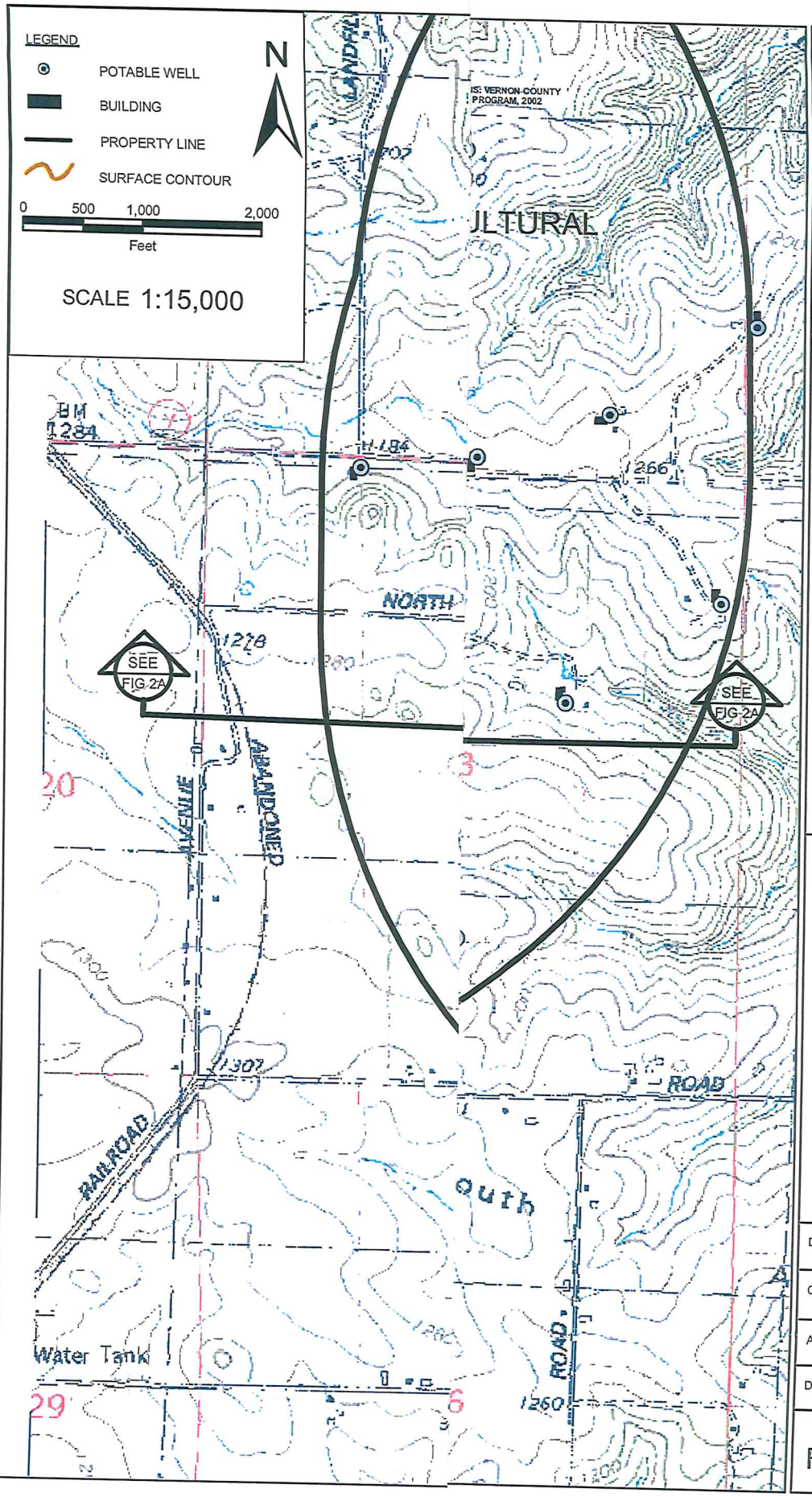
PROJECT:

USGS TOPOGRAPHIC MAP
VERNON COUNTY SANITARY BALEFILL
CLAY BORROW SITE INITIAL SITE INSPECTION

REVISIONS:

Drawn By:	H.S. / S.F.
Checked By:	D.O.
Approved By:	D.O.
Date:	07.18.02 REV. 03.15.10

FIGURE 2A



J:\DRAFT\VERNON\CLAY BORROW SITE\GIS Map\Vernon Clay Base Map (USGSFinalMap02).mxd

CWE, Inc.
5707 SCHOFIELD AVE.
WESTON, WISCONSIN
54476
PHONE:(715)359-9400
FAX:(715)355-4199
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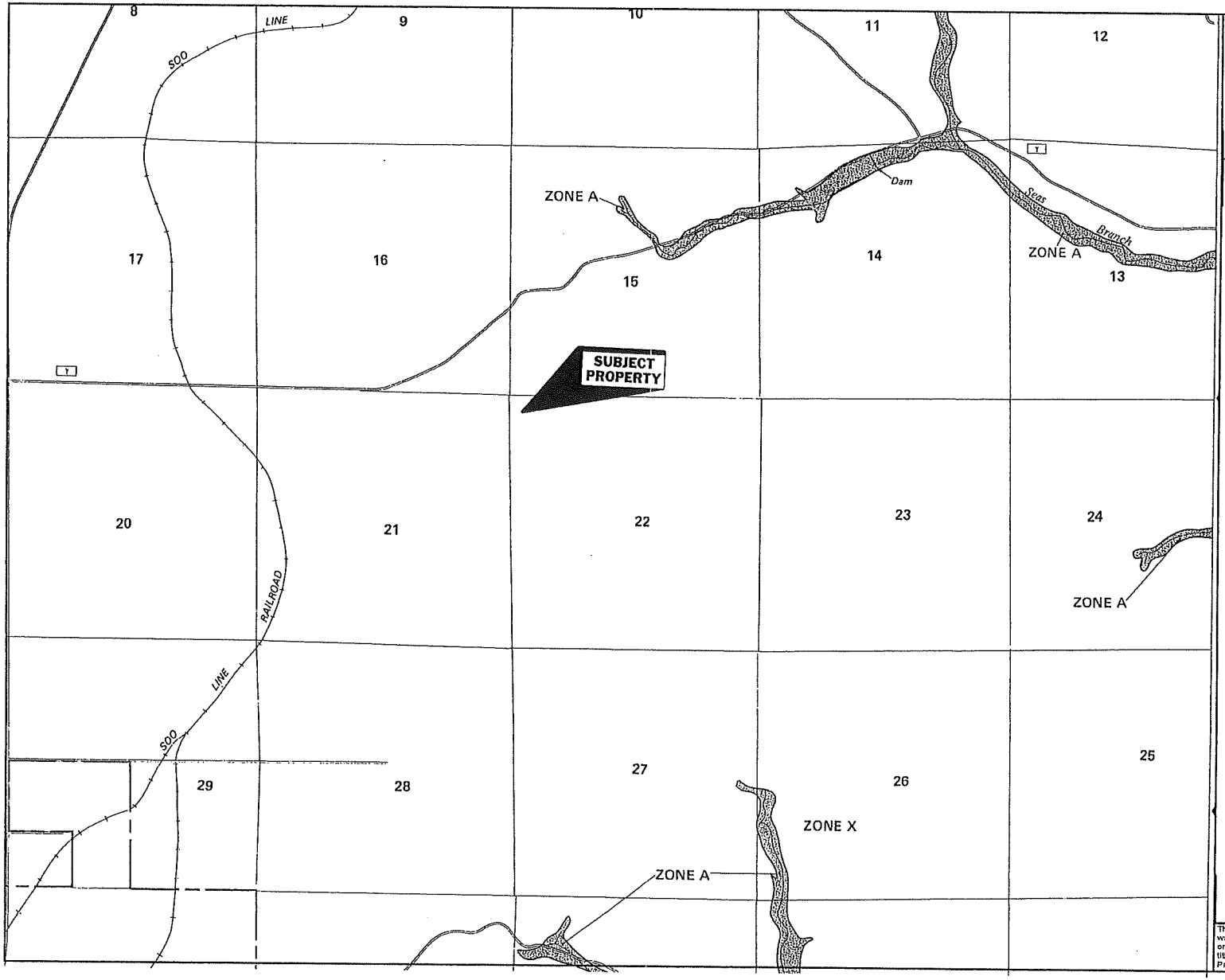
PROJECT:

USGS TOPOGRAPHIC MAP
VERNON COUNTY SANITARY BALEFILL
CLAY BORROW SITE INITIAL SITE INSPECTION

REVISIONS:

Drawn By:	H.S. / S.F.
Checked By:	D.O.
Approved By:	D.O.
Date:	07.18.02 REV. 03.15.10

FIGURE 2B



APPROXIMATE SCALE IN FEET

2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

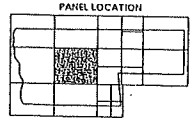
FIRM

FLOOD INSURANCE RATE MAP

VERNON COUNTY, WISCONSIN
(UNINCORPORATED AREAS)

PANEL 150 OF 265
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PANEL LOCATION



COMMUNITY–PANEL NUMBER:
550450 0150 B
MAP REVISED:
NOVEMBER 16, 1990

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary
Scott A. Humrickhouse, Regional Director

LaCrosse Service Center
State Office Building Room 104
3550 Mormon Coulee Road
LaCrosse, Wisconsin 54601
Telephone 608-785-9000
FAX 608-785-9990

May 28, 2010

Mr. Gene Edwards
Vernon County Solid Waste/Recycling Facility
S3705 County Road LF
Viroqua, WI 54601

FID 663038310
APPR File
Vernon Co.

Subject: Initial Site Inspection (ISI), for Soil Borrow Site for Vernon County Sanitary Balefill Landfill, Vernon County, Viroqua Wisconsin, License No. 3268

Dear Mr. Edwards:

This letter is to document the above referenced inspection I performed on October 15, 2009. The purpose of the inspection was to provide the Department's preliminary evaluation of the proposed parcel for location and performance standards under NR 504.04, Wisconsin Administrative Code.

On September 3, 2009 Central Wisconsin Engineer (CWE) submitted a request to the Department to perform an ISI for the Vernon County Sanitary Balefill Site which will be used for the municipal solid waste landfill. On October 15, 2009, Gene Edwards from Vernon County and I met at the proposed site to perform the ISI and review the information included with the ISI request. Vernon County has identified the property located in the Eastern ½ of the NW ¼ of Section 22, Township 13 North, Range 4 West., Town of Viroqua, Vernon County, Wisconsin as a non commercial soil borrow source. During the inspection we also reviewed the information submitted with the ISI request and discussed additional items to be addressed.

Existing land use for the proposed borrow site is agricultural with other agricultural and wooded areas used for timber and private hunting on adjoining properties. As part of the landfill's initial development and subsequent expansion this area was evaluated for endangered resources, wetlands, surface water and environmentally unique areas with none being noted.

On March 2, 2010 the Department requested additional information in order to continue the ISI review. On March 15, 2010 CWE submitted the requested information and an ISI opinion can be rendered.

Based on this information it is the Department's opinion that the soil borrow source meets the locational requirements in NR 504.04, Wis. Adm. Code with the following items being noted:

1. The proposed facility will not be considered to be a commercial borrow source,
2. Their will be multiple borrow events at the site.

If you have any questions regarding this letter, please feel free to contact me at (608) 789-5518.

Sincerely,

Martin Herrick, P.E.
Environmental Engineer
West Central Region

CC: Tom Woletz-WCR
Brian Kalvelage-LAX

APPENDIX C

GEOLOGIC LOGS OF TEST PITS

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 5-92

Facility/Project Name *Vernon Co. Balefill*		**License/Permit/Monitoring Number**	**Boring Number** *TP-1*
Boring Drilled By (Firm name and name of crew chief) *Rory Kjome Excavating* *Rory Kjome*		**Date Drilling Started** *12-3-04*	**Date Drilling Completed** *12-3-04*	**Drilling Method** *Backhoe*
DNR Facility Well No.	**WI Unique Well No.** / **Common Well Name**	**Final Static Water Level** *Feet MSL*	**Surface Elevation** *Feet MSL*	**Borehole Diameter** *inches*
Boring Location **State Plane** *N, E* *NE 1/4, NW 1/4, Sec.22, T13N, R4W*		**Lat** · **Long** ·	**Local Grid Location (if applicable)** *Feet* ***S*** *Feet* ***W***	
County *Vernon*	**DNR County Code** *63*	**Civil Town/City/ or Village** *Viroqua*		

Sample Number and Type	Sample Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	(Topsoil)										
S-1			2-3	Light brown clayey SILT, little sand, trace gravel	CL			10YR 5/6		25.6	47.2	23.2	90.2	
S-2			4-5	Light brown silty CLAY, trace sand & gravel	CH			10YR 4/6		28.7	87.5	55.1	95.0	
			5	E.O.B.@ 5'										
			6											
			7											
			8											
			9											
			10											
			11											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
	Central Wisconsin Engineers and Architects

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	TP-2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Rory Last Name Kjome Firm Rory Kjome Excavating	12-3-04	12-3-04	Backhoe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	_____ inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane _____ N, _____ E S☐ /C☐ /N☐ Lat _____
NE 1/4 of NW 1/4 of Section 22 ,T 13N N,R 4W Long _____

Local Grid Location
☐ N _____ Feet ☐ S ☐ E _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			0	(Topsoil)										
S-1			2.5	Dark yellowbrown clayey SILT, little sand	CL					20	33	20	91	
S-2				Yellowbrown silty sandy CLAY, little gravel	CH					25	62	38	74	
			5	**END OF BORING AT 4.4'**										
			7.5											
			10											
			12.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
	CWE, Inc 5707 Schofield Ave. Weston, WI 54476

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill		*TP-3*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Rory Kjome Excavating *Rory Kjome*	*12-3-04*	*12-3-04*	*Backhoe*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*Feet MSL*	*inches*

Boring Location State Plane *N, E*	Lat Long	Local Grid Location (if applicable)
NE 1/4, NW 1/4, Sec.22, T13N, R4W		*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Vernon	*63*	*Viroqua*

Sample Number and Type	Sample Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	(Topsoil)										
S-1			2	Lightbrown clayey SILT, trace sand	CL			10YR 6/4		22.9	40.3	18.3	99.0	
S-2			3 4	Light Brown clayey sandy SILT, trace gravel	CL			10YR 6/4		16.3	30.9	16.2	80.7	
S-3			5 6 7	Brown clayey SAND, little silt trace gravel	SC			7.5YR 5/6		13.9	29.7	13.0	32.2	
			8 9 10 11	E.O.B.@ 8'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
	Central Wisconsin Engineers and Architects

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	TP-4

Boring Drilled By: Name of crew chief (first, last) and Firm
First Name Rory Last Name Kjome
Firm Rory Kjome Excavating

Date Drilling Started	Date Drilling Completed	Drilling Method
12-3-04	12-3-04	Backhoe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	_____ inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane _____ N, _____ E S☐ /C☐ /N☐ Lat _____
NE 1/4 of NW 1/4 of Section 22 ,T 13N N,R 4W Long _____

Local Grid Location
☐ N ☐ E
_____ Feet ☐ S _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			0	(Topsoil)										
S-1			2.5	Yellowish brown clayey SILT, trace sand	CL					22	40	18	99	
S-2			5	Yellowish brown clayey SILT, trace sand	CL					22	30	7	99	
			7.5											
				END OF BORING AT 9.1'										
			10											
			12.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm CWE, Inc.
5707 Schofield Ave.
Weston, WI 54476

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	TP-5

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Rory Last Name Kjome Firm Rory Kjome Excavating	12-3-04	12-3-04	Backhoe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	_____ inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane _____ N, _____ E S☐ /C☐ /N☐ Lat _____
NE 1/4 of NW 1/4 of Section 22 ,T 13N N,R 4W Long _____

Local Grid Location
_____ Feet ☐ N ☐ S _____ Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			0	(Topsoil)										
S-1			2.5	Yellowish brown clayey SILT, trace sand	CL					21	38	15	99	
S-2			5	Yellowbrown clayey SILT, little sand, trace gravel	CL-ML					17	25	5	89	
			7.5	**END OF BORING AT 7.6'**										
			10											
			12.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm CWE, Inc.
5707 Schofield Ave.
Weston, WI 54476

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 5-92

Facility/Project Name	**License/Permit/Monitoring Number**	**Boring Number**
Vernon Co. Balefill		*TP-6*

Boring Drilled By (Firm name and name of crew chief)	**Date Drilling Started**	**Date Drilling Completed**	**Drilling Method**
Rory Kjome Excavating *Rory Kjome*	*12-3-04*	*12-3-04*	*Backhoe*

DNR Facility Well No.	**WI Unique Well No.**	**Common Well Name**	**Final Static Water Level**	**Surface Elevation**	**Borehole Diameter**
			Feet MSL	*Feet MSL*	*inches*

Boring Location **State Plane** *N, E*	**Lat** · **Long** ·	**Local Grid Location (if applicable)**
NE 1/4, NW 1/4, Sec.22, T13N, R4W		*Feet* ***S*** *Feet* ***W***

County	**DNR County Code**	**Civil Town/City/ or Village**
Vernon	*63*	*Viroqua*

Sample Number and Type	Sample Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Munsell	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	(Topsoil)										
S-1			2	Yellowbrown clayey SILT, trace sand & gravel	CL			10YR 5/6		21.5	42.9	21.1	96.2	
S-2			3 4	Yellowbrown silty Clay, little sand	CH			10YR 5/6		23.6	74.9	46.8	89.7	
			5 6 7 8 9 10 11	E.O.B.@ 4.6'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
	Central Wisconsin Engineers and Architects

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	TP-7

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Rory Last Name Kjome Firm Rory Kjome Excavating	12-3-04	12-3-04	Backhoe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	_____ inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane _____ N, _____ E S☐/C☐ /N☐ Lat _____
NE 1/4 of NW 1/4 of Section 22 ,T 13N N,R 4W Long _____

Local Grid Location
_____ Feet ☐ N ☐ S _____ Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plastic Limit	Soil Properties: P 200	RQD/ Comments
			0	(Topsoil)										
S-1				Yellowbrown clayey SILT, trace sand & gravel	CL					22	44	24	96	
S-2			2.5	Brown silty CLAY, little sand & gravel	MH					29	78	39	95	
				END OF BORING AT 2.5'										
			5											
			7.5											
			10											
			12.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm CWE, Inc.
5707 Schofield Ave.
Weston, WI 54476

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	TP-8

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Rory Last Name Kjome Firm Rory Kjome Excavating	12-3-04	12-3-04	Backhoe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	_____ inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane _____ N, _____ E S☐ /C☐ /N☐ Lat _____
NE 1/4 of NW 1/4 of Section 22 ,T 13N N,R 4W Long _____

Local Grid Location
☐ N ☐ E
_____ Feet ☐ S _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			0	(Topsoil)										
S-1			2.5	Yellowbrown clayey SILT, trace sand	ML					23	31	8	99	
			5											
S-2			7.5	Yellow-brown clayey sandy SILT, trace gravel	MH					27	61	30	77	
				END OF BORING AT 7'										
			10											
			12.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm CWE, Inc.
5707 Schofield Ave.
Weston, WI 54476

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	TP-9

Boring Drilled By: Name of crew chief (first, last) and Firm
First Name Rory Last Name Kjome
Firm Rory Kjome Excavating

Date Drilling Started	Date Drilling Completed	Drilling Method
12-3-04	12-3-04	Backhoe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	_____ inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane _____ N, _____ E S☐/C☐ /N☐ Lat _____
NE 1/4 of NW 1/4 of Section 22 ,T 13N N,R 4W Long _____

Local Grid Location
☐ N ☐ E
_____ Feet ☐ S _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			0	(Topsoil)										
S-1			2.5	Dark yellowbrown clayey SILT, trace sand	CL					22	37	14	100	
			5											
S-2			7.5	Dark yellowbrown clayey SILT, trace sand	CL					21	32	9	100	
				END OF BORING AT 8.5'										
			10											
			12.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

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5707 Schofield Ave.
Weston, WI 54476

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	TP-10

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Rory Last Name Kjome Firm Rory Kjome Excavating	12-3-04	12-4-04	Backhoe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	_____ inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane _____ N, _____ E S☐/C☐ /N☐ Lat _____
NE 1/4 of NW 1/4 of Section 22 ,T 13N N,R 4W Long _____

Local Grid Location
_____ Feet ☐ N ☐ S _____ Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			0	(Topsoil)										
S-1			2.5	Yellowbrown clayey SILT, trace sand	CL					25	34	14	99	
			5											
S-2			7.5	Yellowbrown clayey SILT, trace sand	CL					28	33	12	99	
			10	**END OF BORING AT 9.5'**										
			12.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm CWE, Inc.
5707 Schofield Ave.
Weston, WI 54476

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	TP-11

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Rory Last Name Kjome Firm Rory Kjome Excavating	12-3-04	12-3-04	Backhoe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	_____ inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane _____ N, _____ E S☐/C☐/N☐ Lat _____
NE 1/4 of NW 1/4 of Section 22 ,T 13N N,R 4W Long _____

Local Grid Location
☐ N ☐ E
_____ Feet ☐ S _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			0	(Topsoil)										
S-1			2.5	Dark yellowbrown clayey SILT, trace sand	CL					24	38	20	97	
S-2			5	Dark yellowbrown silty CLAY, little sand, trace gravel	CH					35	60	32	88	
			7.5	**END OF BORING AT 6.8'**										
			10											
			12.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm CWE, Inc.
5707 Schofield Ave.
Weston, WI 54476

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	TP-12

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Rory Last Name Kjome Firm Rory Kjome Excavating	12-3-04	12-3-04	Backhoe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	_____ inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane _____ N, _____ E S☐/C☐ /N☐ Lat _____
NE 1/4 of NW 1/4 of Section 22 ,T 13N N,R 4W Long _____

Local Grid Location
_____ Feet ☐ N ☐ S _____ Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
S-1			0	Dark yellowishbrown clayey SILT, trace sand	CL					23	35	16	98	
			2.5											
			5	**END OF BORING AT 5'**										
			7.5											
			10											
			12.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm CWE, Inc.
5707 Schofield Ave.
Weston, WI 54476

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	TP-13

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Rory Last Name Kjome Firm Rory Kjome Excavating	12-3-04	12-3-04	Backhoe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	_____ inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane _____ N, _____ E S☐ /C☐ /N☐ Lat _____
NE 1/4 of NW 1/4 of Section 22 ,T 13N N,R 4W Long _____

Local Grid Location
☐ N ☐ E
_____ Feet ☐ S _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			0	(Topsoil)										
S-1			2.5	Dark yellowbrown clayey SILT, trace sand	CL					21	37	18	99	
S-2			5	Yellowish brown silty sandy CLAY, trace gravel	CL					21	32	14	62	
				END OF BORING AT 5'										
			7.5											
			10											
			12.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm CWE, Inc.
5707 Schofield Ave.
Weston, WI 54476

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	TP-14

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Rory Last Name Kjome Firm Rory Kjome Excavating	12-3-04	12-3-04	Backhoe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	_____ inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane _____ N, _____ E S☐/C☐ /N☐
NE 1/4 of NW 1/4 of Section 22 ,T 13N N,R 4W
Lat _____ Long _____
Local Grid Location ☐ N ☐ E _____ Feet ☐ S _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			0	(Topsoil)										
S-1				Dark yellowbrown clayey SILT, trace sand	CL					22	28	8	99	
			2.5											
			5											
S-2				Dark yellowbrown clayey SILT, trace sand	ML					21	32	8	100	
			7.5	**END OF BORING AT 7.5'**										
			10											
			12.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

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Weston, WI 54476

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Vernon Co. Balefill	03268	TP-15

Boring Drilled By: Name of crew chief (first, last) and Firm
First Name Rory Last Name Kjome
Firm Rory Kjome Excavating

Date Drilling Started	Date Drilling Completed	Drilling Method
12-3-04	12-3-04	Backhoe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	_____ inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane _____ N, _____ E S☐/C☐ /N☐
NE 1/4 of NW 1/4 of Section 22 ,T 13N N,R 4W
Lat _____ Long _____
Local Grid Location
_____ Feet ☐ N ☐ S _____ Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	Vernon	63	Viroqua

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			0	(Topsoil)										
S-1			2.5	Dark yellowbrown clayey SILT, trace sand	CL-ML					25	28	6	100	
			5											
S-2			7.5	Dark yellowbrown clayey SILT, trace sand	CL					23	32	10	99	
			10	**END OF BORING AT 9.2'**										
			12.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

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Weston, WI 54476

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APPENDIX D

SUMMARY OF FINAL TEST INFORMATION

Central Wisconsin
Engineers
P.O. Box 107 * Schofield, WI 54476 * (715) 359-9400

FINAL TEST INFORMATION

Project: Vernon Co. Clay Test Pit Job No: 946 02 000 Date: 4/28/2005

By: MJB

Boring No.	Sample No.	Location	% Clay	% Silt	Gradation - % Passing 200	100	#40	#10	#4	3/8"	3/4"	1"	2"	LL	Pl	USCS	W %	OPT. M%	Max. DD	k -(CM/S)
TP-1	S-1	1.5'-3.5'	34.1	56.1	90.2	91.4	95.7	97.9	98.9	99.7	100.0	100.0	100.0	47.2	23.2	CL	25.6			
TP-1	S-2	3.5'-5.0'	67.6	27.4	95.0	96.0	98.9	99.8	99.9	100.0	100.0	100.0	100.0	87.5	55.1	CH	28.7			
TP-2	S-1	1.4'-3'	25.3	65.8	91.1	92.6	96.8	99.5	100.0	100.0	100.0	100.0	100.0	33.1	19.5	CL	20.1			
TP-2	S-2	3'-4.4'	48.2	26.2	74.4	76.8	84.7	91.2	93.9	98.2	100.0	100.0	100.0	62.4	37.5	CH	25.1			
TP-3	S-1	1.2'-3'	23.2	75.8	99.0	99.3	99.7	100.0	100.0	100.0	100.0	100.0	100.0	40.3	18.3	CL	22.9	14.8	112.6	9.12×10^{-8}
TP-3	S-2	3'-5'	31.2	49.5	80.7	82.7	92.2	98.0	98.8	99.6	100.0	100.0	100.0	30.9	16.2	CL	16.3			
TP-3	S-3	5'-8'	20.6	11.6	32.2	37.1	78.2	97.8	98.6	99.7	100.0	100.0	100.0	29.7	13.0	SC	13.9			
TP-4	S-1	1.1'-5'	23.2	75.9	99.1	99.4	99.9	100.0	100.0	100.0	100.0	100.0	100.0	40.2	18.4	CL	21.9			
TP-4	S-2	8'-9.1'	18.9	80.1	98.9	99.2	99.8	100.0	100.0	100.0	100.0	100.0	100.0	29.7	7.4	CL	22.2			
TP-5	S-1	1'-3'	22.7	76.7	99.4	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	37.6	17.7	CL	20.6			
TP-5	S-2	6'-7.6'	18.1	70.8	88.9	90.1	94.2	98.1	99.8	99.9	100.0	100.0	100.0	25.1	4.5	CL-ML	16.5			
TP-6	S-1	1.0'-2.5'	28.1	68.1	96.2	96.8	98.1	98.9	99.5	100.0	100.0	100.0	100.0	42.9	21.1	CL	21.5			
TP-6	S-2	2.5'-4.6'	59.4	30.3	89.7	92.3	99.3	100.0	100.0	100.0	100.0	100.0	100.0	74.9	46.8	CH	23.6			
TP-7	S-1	1'-2'	30.3	65.2	95.5	96.1	97.4	98.5	99.1	99.7	100.0	100.0	100.0	43.9	23.9	CL	22.2	18.8	104.4	1.32×10^{-8}
TP-7	S-2	2'-2.5'	72.4	22.2	94.7	95.7	98.5	99.7	99.9	100.0	100.0	100.0	100.0	78.3	39.3	MH	29.3			
TP-8	S-1	1'-3'	22.9	76.3	99.2	99.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	30.7	7.6	ML	23.1			
TP-8	S-2	6'-7'	51.1	25.8	76.9	80.1	91.2	97.0	99.2	100.0	100.0	100.0	100.0	61.3	29.9	MH	26.6			
TP-9	S-1	1'-2.5'	26.1	73.5	99.6	99.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	36.6	14.2	CL	21.9			
TP-9	S-2	7'-8.5'	17.5	82.0	99.5	99.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	31.6	9.1	CL	21.4			
TP-10	S-1	1.5'-3.5'	29.1	70.0	99.1	99.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	34.2	14.2	CL	25.1			
TP-10	S-2	7'-9.5'	30.6	68.6	99.2	99.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	33.4	12.4	CL	27.5	17.7	104.2	2.15×10^{-7}
TP-11	S-1	1.2'-4.2'	34.4	63.0	97.4	98.0	99.4	100.0	100.0	100.0	100.0	100.0	100.0	37.7	19.7	CL	23.7			
TP-11	S-2	4.2'-6.8'	58.9	29.3	88.2	91.0	96.4	99.1	99.8	100.0	100.0	100.0	100.0	60.2	31.7	CH	34.7			
TP-12	S-1	1'-3.2'	30.3	67.5	97.8	98.3	99.4	100.0	100.0	100.0	100.0	100.0	100.0	35.2	15.8	CL	23.7			
TP-13	S-1	1'-4'	27.7	71.0	98.7	99.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	36.5	17.6	CL	21.4			
TP-13	S-2	4'-5'	39.4	22.8	62.2	67.5	87.9	98.0	99.1	100.0	100.0	100.0	100.0	32.4	14.1	CL	20.9			
TP-14	S-1	1'-3'	25.7	73.3	99.0	99.4	99.9	100.0	100.0	100.0	100.0	100.0	100.0	28.1	7.7	CL	22.2			

Engineers
P.O. Box 107 * Schofield, WI 54476 * (715) 359-9400

FINAL TEST INFORMATION

Project: Vernon Co. Clay Test Pit Job No: 946 02 000 Date: 4/28/2005

By: MJB

Boring	Sample		%		Gradation - % Passing																
No.	No.	Location	Clay	Silt	200	100	#40	#10	#4	3/8"	3/4"	1"	2"	LL	PI	USCS	W %	OPT. M%	Max. DD	k -(CM/S)
TP-14	S-2	6'-7.5'	22.1	77.5	99.6	99.8	99.9	100.0	100.0	100.0	100.0	100.0	100.0	32.3	8.1	ML	21.0			
TP-15	S-1	1.2'-3.5'	26.2	73.5	99.7	99.8	99.9	100.0	100.0	100.0	100.0	100.0	100.0	27.5	6.1	CL-ML	25.2			
TP-15	S-2	7'-9.2'	25.0	74.4	99.4	99.7	99.9	100.0	100.0	100.0	100.0	100.0	100.0	32.3	10.0	CL	22.7			

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APPENDIX E

WATER CONTENT DETERMINATION DATA

WATER CONTENT DETERMINATION

Project: Vernon Co. Clay Test Pit Job No. 946 02 000

Location of Project: Vernon Co.

Description of Soil: Lean Clay w/ sand

Tested By: M. Krause Date of Testing: 1/20/2005

Date of Weighing: 1/24/2005

Sample No.	TP-1/S-1	TP-1/S-2	TP-2/S-1	TP-2/S-2	TP-3/S-1	TP-3/S-2	TP-3/S-3	TP-4/S-1
Container No.	D-10	D-16	D-17	D-26	D-28	D-29	D-31	D-33
Wt. of cup + wet soil	1066	988	1167	1072	1209	1462	1166	1184
Wt. of cup + dry soil	852	771	974	860	986	1259	1025	974
Wt. of cup	14.6	14.3	14.3	14.5	14.3	14.2	14.2	14.5
Wt. of dry soil	837.4	756.7	959.7	845.5	971.7	1244.8	1010.8	959.5
Wt. of Water	214.0	217.0	193.0	212.0	223.0	203.0	141.0	210.0
Water Content, w%	25.6	28.7	20.1	25.1	22.9	16.3	13.9	21.9

Sample No.	TP-4/S-2	TP-5/S-1	TP-5/S-2	TP-6/S-1	TP-6/S-2	TP-7/S-1	TP-7/S-2	TP-8/S-1
Container No.	D-35	D-36	D-37	D-42	D-43	D-45	D-46	D-47
Wt. of cup + wet soil	1539	1286	1473	1199	1120	1117	1134	1119
Wt. of cup + dry soil	1262	1069	1266	989	909	917	880	912
Wt. of cup	14	14.6	14.2	14.4	14.5	14.4	14.3	14.4
Wt. of dry soil	1248	1054.4	1251.8	974.6	894.5	902.6	865.7	897.6
Wt. of Water	277	217	207	210	211	200	254	207
Water Content, w%	22.2	20.6	16.5	21.5	23.6	22.2	29.3	23.1

REMARKS:

G:\soils\wt_cont

WATER CONTENT DETERMINATION

Project: Vernon Co. Clay Test Pit Job No. 946 02 000

Location of Project: Vernon Co.

Description of Soil: Lean Clay w/ sand

Tested By: M. Krause Date of Testing: 1/21/2005

Date of Weighing: 1/24/2005

Sample No.	TP-8/S-2	TP-9/S-1	TP-9/S-2	TP-10/S-1	TP-10/S-2	TP-11/S-1	TP-11/S-2	TP-12/S-1
Container No.	D-48	D-49	D-50	D-52	D-53	D-54	D-55	D-58
Wt. of cup + wet soil	1241	1110	1167	1145	1478	1204	1027	1184
Wt. of cup + dry soil	983	913	964	912	1162	976	766	960
Wt. of cup	14.2	14.4	14.1	14	13.9	13.9	14.2	14
Wt. of dry soil	968.8	898.6	949.9	898	1148.1	962.1	751.8	946
Wt. of Water	258.0	197.0	203.0	233.0	316.0	228.0	261	224.0
Water Content, w%	26.6	21.9	21.4	25.1	27.5	23.7	34.7	23.7

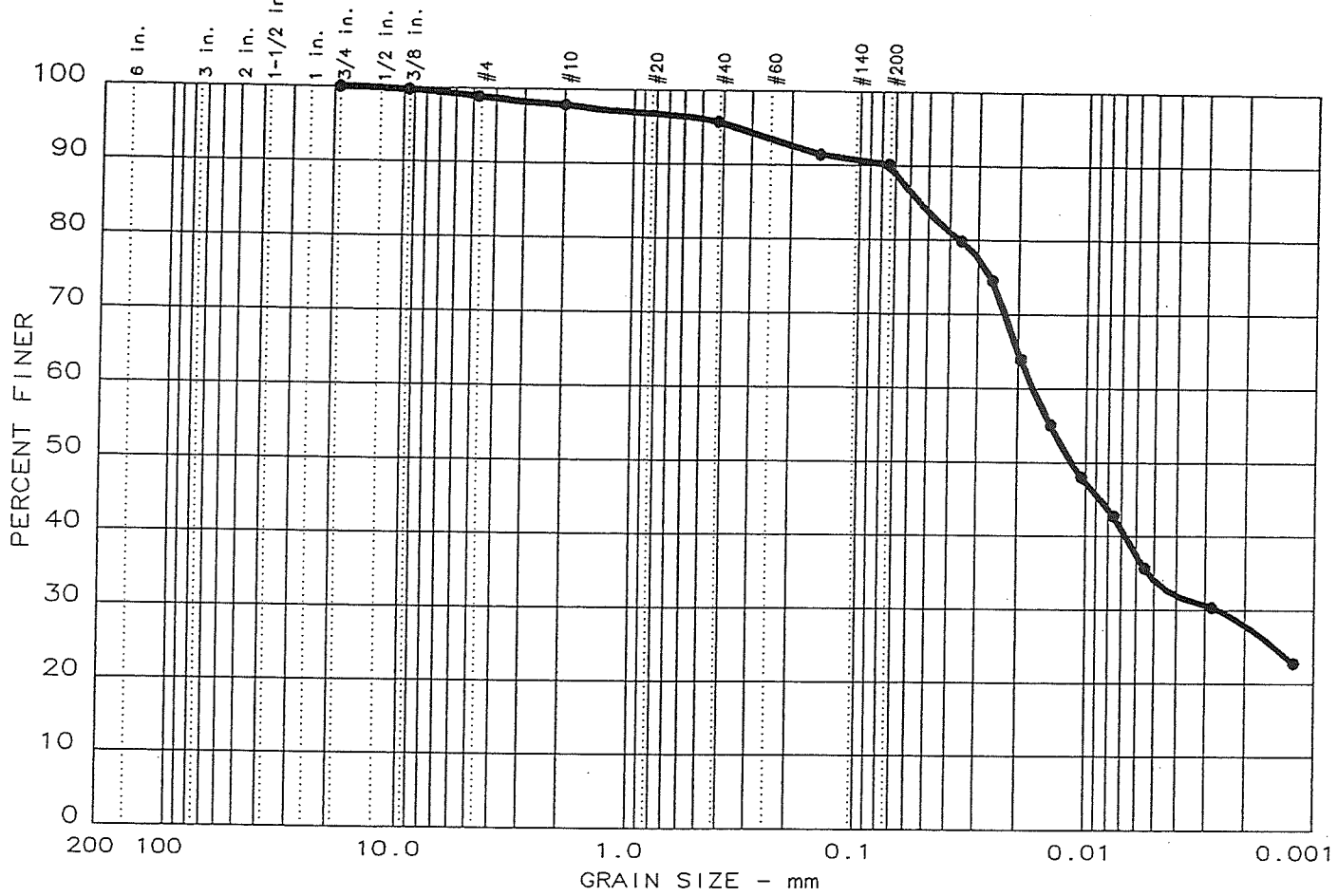
Sample No.	TP-13/S-1	TP-13/S-2	TP-14/S-1	TP-14/S-2	TP-15/S-1	TP-15/S-2		
Container No.	D-59	D-71	D-72	D-73	D-74	D-89		
Wt. of cup + wet soil	1212	1160	1127	1254	1058	1110		
Wt. of cup + dry soil	1001	962	925	1039	848	907		
Wt. of cup	13.9	14	13.9	13.7	13.6	13.9		
Wt. of dry soil	987.1	948	911.1	1025.3	834.4	893.1		
Wt. of Water	211	198	202	215	210	203		
Water Content, w%	21.4	20.9	22.2	21	25.2	22.7		

REMARKS:

APPENDIX F

GRAIN SIZE ANALYSIS - MECHANICAL AND HYDROMETER

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	1.1	8.7	56.1	34.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	47.2	23.2			0.0115	0.0026				

MATERIAL DESCRIPTION	USCS	AASHTO
● Lt. Brown clayey SILT, Lt sand, trace gravel	CL	

Project No.: 946 02 000
Project: Vernon Co. Clay test pit
● Location: TP-1/S-1

Date: 2/7/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 1

ıte: 2/7/05
:oject No.: 946 02 000
:oject: Vernon Co. Clay test pit

Sample Data

)cation of Sample: TP-1/S-1
ımple Description: Lt. Brown clayey SILT, Lt sand, trace gravel
;CS Class: CL Liquid limit: 47.2
ıSHTO Class: Plasticity index: 23.2

Notes

:marks: Clay cover

.g. No.: 1

Mechanical Analysis Data

	Initial	After wash
:y sample and tare=	624.00	201.80
ıre =	154.90	155.10
:y sample weight =	469.10	46.70
.nus #200 from wash=	90.0 %	

.eve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	1.30	0.00	99.7
# 4	4.00	0.00	98.9
# 10	4.70	0.00	97.9
# 40	10.00	0.00	95.7
# 100	20.30	0.00	91.4
# 200	5.90	0.00	90.2

Hydrometer Analysis Data

:paration sieve is number 200
:rcent -#200 based on complete sample= 90.2
:ight of hydrometer sample: 50
ılculated biased weight= 55.46
ıtomatic temperature correction
Composite correction at 20 deg C =-6.5

:niscus correction only= 1
)ecific gravity of solids= 2.74
)ecific gravity correction factor= 0.980
/drometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

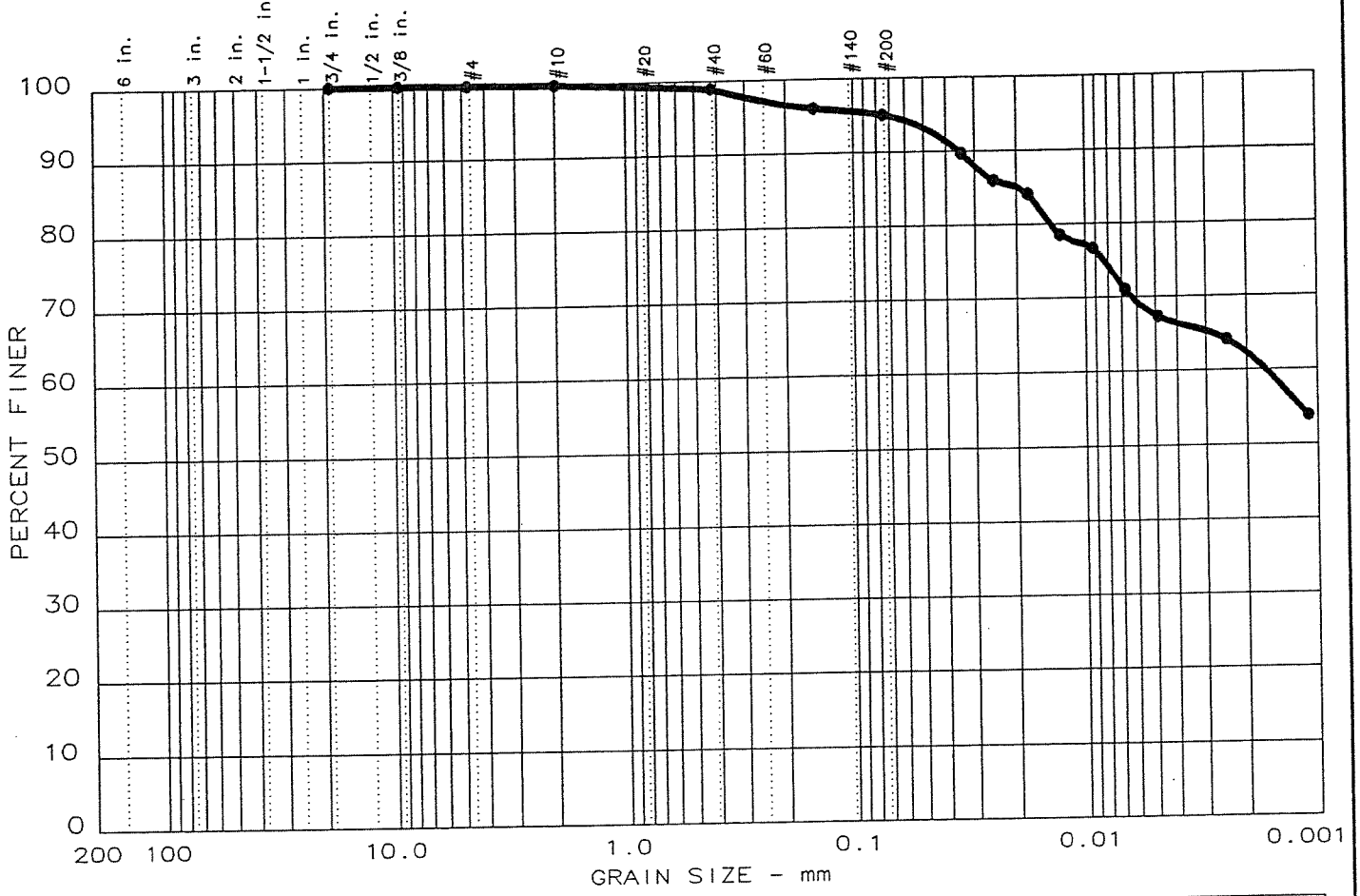
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.0	51.0	45.2	0.0128	52.0	7.8	0.0357	79.8
2.0	23.0	48.0	42.2	0.0128	49.0	8.3	0.0260	74.5
4.0	23.0	42.0	36.2	0.0128	43.0	9.2	0.0195	63.9
8.0	23.0	37.0	31.2	0.0128	38.0	10.1	0.0144	55.1
16.0	23.0	33.0	27.2	0.0128	34.0	10.7	0.0105	48.0
32.0	23.0	30.0	24.2	0.0128	31.0	11.2	0.0076	42.7
64.0	23.0	26.0	20.2	0.0128	27.0	11.9	0.0055	35.6
256.0	23.0	23.0	17.2	0.0128	24.0	12.4	0.0028	30.3
1440.0	22.0	19.0	12.9	0.0130	20.0	13.0	0.0012	22.8

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 1.1 % SAND = 8.7
% SILT = 56.1 % CLAY = 34.1

D85= 0.05 D60= 0.017 D50= 0.011
D30= 0.0026

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.1	4.9	27.4	67.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	87.5	55.1								

MATERIAL DESCRIPTION	USCS	AASHTO
● Lt. Brown silty CLAY, trace sand & gravel	CH	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-1/S-2

Date: 2/7/05

Remarks:
Clay cover

GRAIN SIZE DISTRIBUTION TEST REPORT
CENTRAL WISCONSIN ENGINEERS, INC.

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 2

Date: 2/7/05
Project No.: 946-02-000
Project: Vernon Co. Clay test pit

Sample Data

Location of Sample: TP-1/S-2
Sample Description: Lt. Brown silty CLAY, trace sand & gravel
USCS Class: CH Liquid limit: 87.5
AASHTO Class: Plasticity index: 55.1

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	563.00	178.60
Tare =	157.10	157.20
Dry sample weight =	405.90	21.40

Minus #200 from wash= 94.7 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.40	0.00	99.9
# 10	0.40	0.00	99.8
# 40	3.60	0.00	98.9
# 100	11.70	0.00	96.0
# 200	4.30	0.00	95.0

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 95.0
Weight of hydrometer sample: 50
Calculated biased weight= 52.65
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

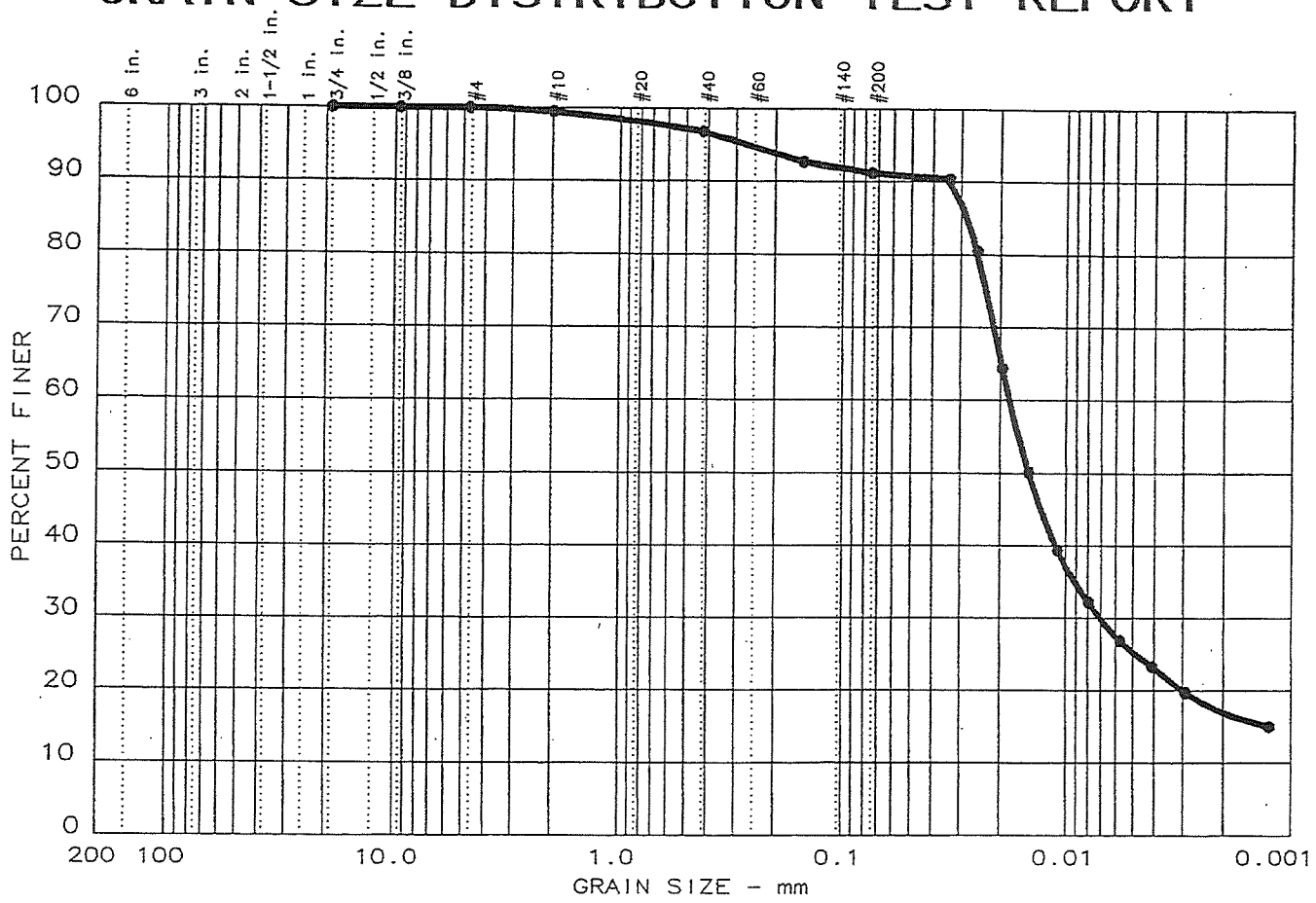
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.0	54.0	48.2	0.0128	55.0	7.3	0.0345	89.7
2.0	23.0	52.0	46.2	0.0128	53.0	7.6	0.0250	86.0
4.0	23.0	51.0	45.2	0.0128	52.0	7.8	0.0178	84.1
8.0	23.0	48.0	42.2	0.0128	49.0	8.3	0.0130	78.5
16.0	23.0	47.0	41.2	0.0128	48.0	8.4	0.0093	76.7
32.0	23.0	44.0	38.2	0.0128	45.0	8.9	0.0068	71.1
64.0	23.0	42.0	36.2	0.0128	43.0	9.2	0.0049	67.4
256.0	24.0	40.0	34.5	0.0127	41.0	9.6	0.0024	64.2
1440.0	22.0	35.0	28.9	0.0130	36.0	10.4	0.0011	53.8

Fractional Components

avel/Sand based on #4 sieve
nd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.1 % SAND = 4.9
SILT = 27.4 % CLAY = 67.6

5= 0.02 D60= 0.00

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.0	8.9	65.8	25.3

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	33.1	19.5			0.0148	0.0070				

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellow-brown clayey SILT, little sand	CL	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-2/S-1

Date: 2/15/05

Remarks:

Clay cover

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA — Test No.: 15

Date: 2/15/05
Project No.: 946-02-000
Project: Vernon Co. Clay test pit

Sample Data

Location of Sample: TP-2/S-1
Sample Description: Dark yellow-brown clayey SILT, little sand
USCS Class: CL
AASHTO Class:
Liquid limit: 33.1
Plasticity index: 19.5

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	685.40	202.50
Tare =	155.40	155.40
Dry sample weight =	530.00	47.10

Minus #200 from wash= 91.1 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	2.90	0.00	99.5
# 40	14.00	0.00	96.8
# 100	22.10	0.00	92.6
# 200	8.10	0.00	91.1

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 91.1
Weight of hydrometer sample: 50
Calculated biased weight= 54.88
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

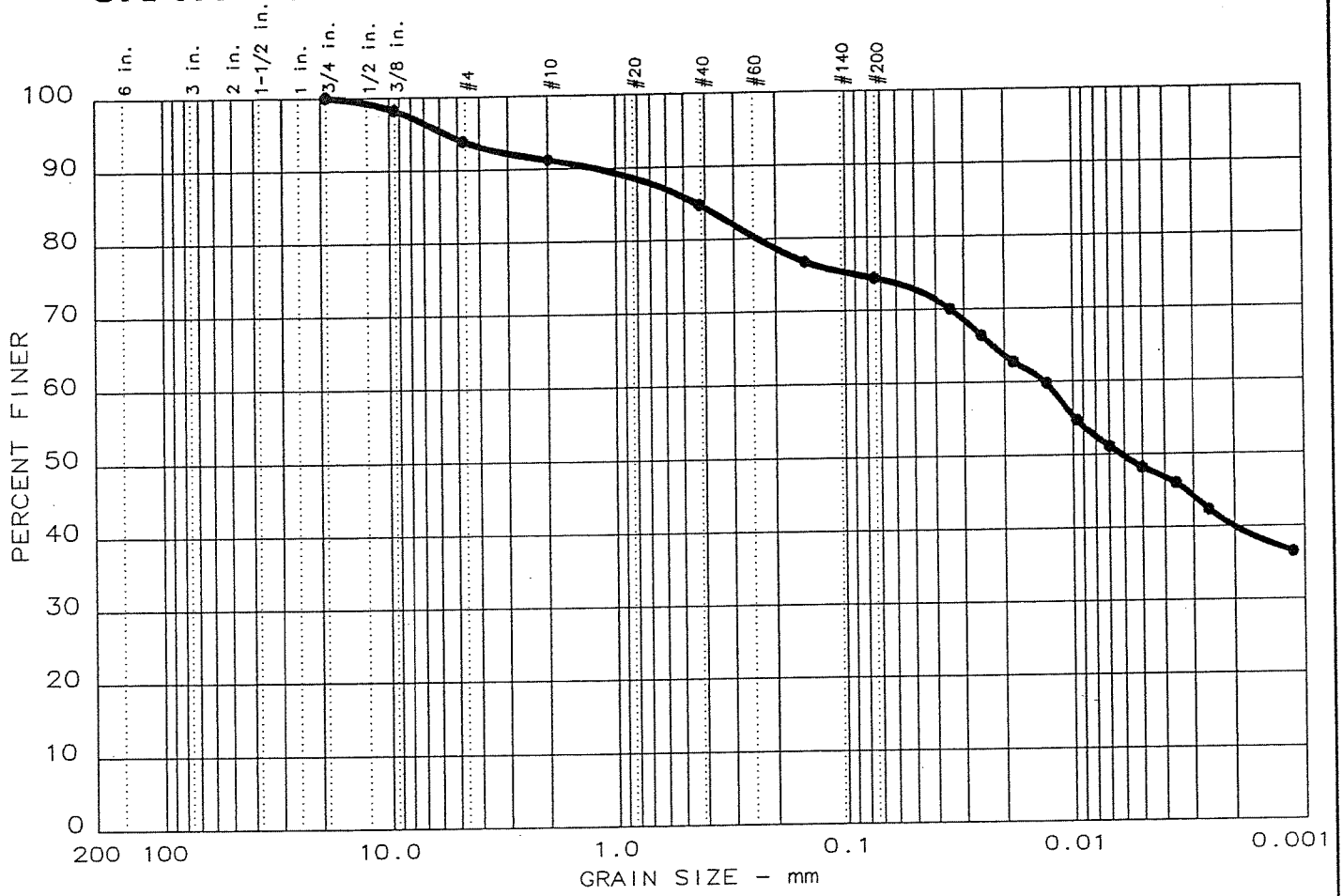
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	22.5	56.5	50.5	0.0129	57.5	6.9	0.0338	90.3
2.0	22.5	51.0	45.0	0.0129	52.0	7.8	0.0254	80.5
4.0	22.5	42.0	36.0	0.0129	43.0	9.2	0.0196	64.4
8.0	22.5	34.0	28.0	0.0129	35.0	10.6	0.0148	50.1
16.0	22.5	28.0	22.0	0.0129	29.0	11.5	0.0109	39.4
32.0	22.5	24.0	18.0	0.0129	25.0	12.2	0.0080	32.2
64.0	22.5	21.0	15.0	0.0129	22.0	12.7	0.0057	26.9
128.0	22.5	19.0	13.0	0.0129	20.0	13.0	0.0041	23.3
256.0	22.5	17.0	11.0	0.0129	18.0	13.3	0.0029	19.7
1440.0	22.0	14.5	8.4	0.0130	15.5	13.8	0.0013	15.0

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 8.9
% SILT = 65.8 % CLAY = 25.3

D85= 0.03 D60= 0.018 D50= 0.015
D30= 0.0070

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	6.1	19.5	26.2	48.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	62.4	37.5	0.437		0.0062					

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellow-brown silty sandy CLAY, little gravel	CH	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-2/S-2

Date: 2/15/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 3

Date: 2/15/05
Project No.: 946-02-000
Project: Vernon Co. Clay test pit

Sample Data

Location of Sample: TP-2/S-2
Sample Description: Yellow-brown silty sandy CLAY, little gravel
USCS Class: CH Liquid limit: 62.4
AASHTO Class: Plasticity index: 37.5

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	617.00	275.30
Tare =	156.30	156.40
Dry sample weight =	460.70	118.90

Minus #200 from wash= 74.2 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	8.30	0.00	98.2
# 4	19.70	0.00	93.9
# 10	12.50	0.00	91.2
# 40	29.80	0.00	84.7
# 100	36.80	0.00	76.8
# 200	10.90	0.00	74.4

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 74.4
Weight of hydrometer sample: 50
Calculated biased weight= 67.22
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

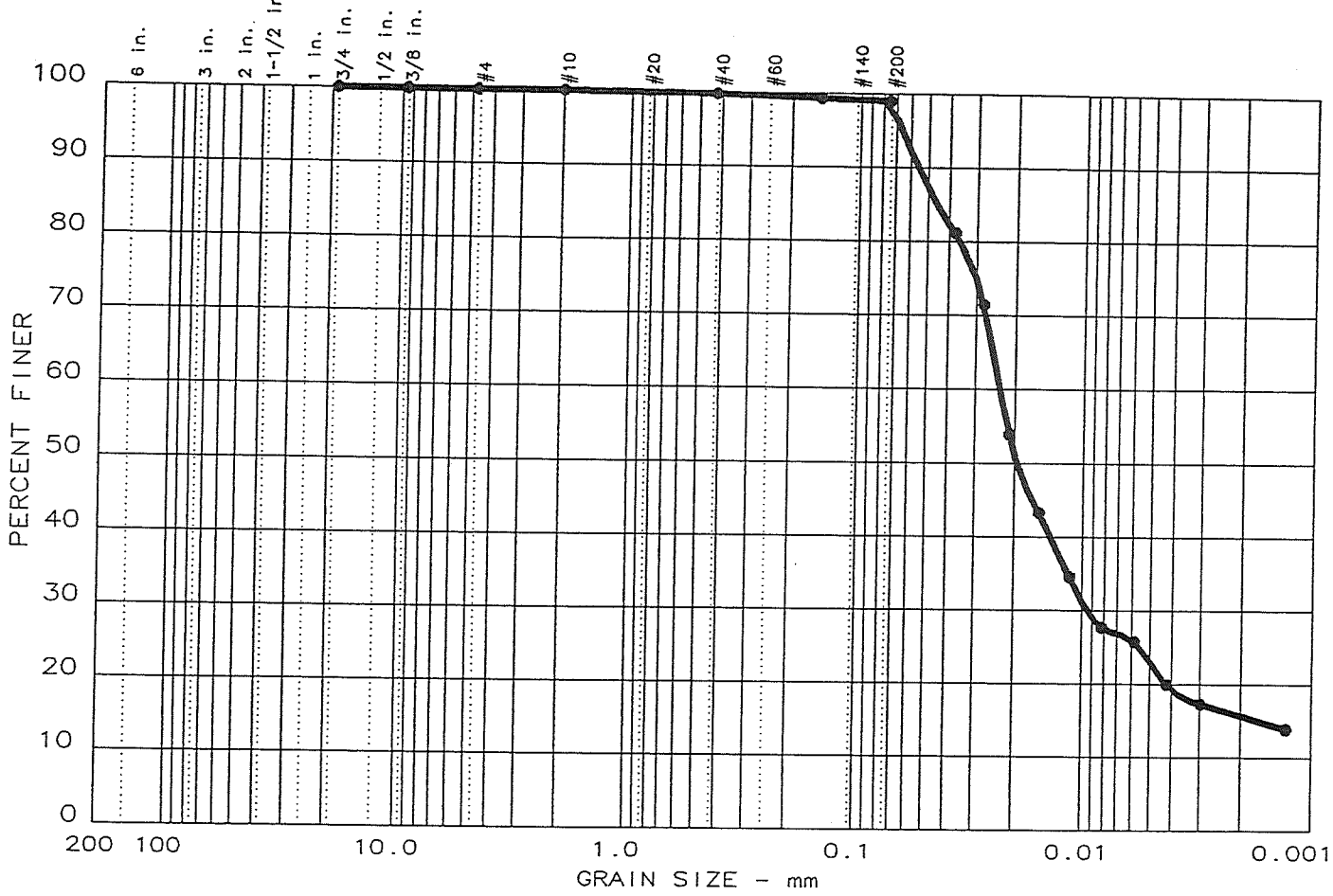
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	22.5	54.0	48.0	0.0129	55.0	7.3	0.0348	70.1
2.0	22.5	51.5	45.5	0.0129	52.5	7.7	0.0253	66.4
4.0	22.5	49.0	43.0	0.0129	50.0	8.1	0.0183	62.8
8.0	22.5	47.0	41.0	0.0129	48.0	8.4	0.0132	59.9
16.0	22.5	43.5	37.5	0.0129	44.5	9.0	0.0097	54.7
32.0	22.5	41.0	35.0	0.0129	42.0	9.4	0.0070	51.1
64.0	22.5	39.0	33.0	0.0129	40.0	9.7	0.0050	48.2
128.0	22.5	37.5	31.5	0.0129	38.5	10.0	0.0036	46.0
256.0	22.5	35.0	29.0	0.0129	36.0	10.4	0.0026	42.4
1440.0	22.5	31.0	25.0	0.0129	32.0	11.0	0.0011	36.5

Fractional Components

avel/Sand based on #4 sieve
nd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 6.1 % SAND = 19.5
SILT = 26.2 % CLAY = 48.2

5= 0.44 D60= 0.013 D50= 0.006

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.0	1.0	75.8	23.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	40.3	18.3			0.0195	0.0094	0.0017			

MATERIAL DESCRIPTION	USCS	AASHTO
● Lt. Brown clayey SILT, trace sand	CL	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-3/S-1

Date: 2/22/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 4

te: 2/22/05
oject No.: 946-02-000
oject: Vernon Co. Clay test pit

Sample Data

cation of Sample: TP-3/S-1
mple Description: Lt. Brown clayey SILT, trace sand
CS Class: CL Liquid limit: 40.3
SHTO Class: Plasticity index: 18.3

Notes

marks: Clay cover

g. No.: 1

Mechanical Analysis Data

	Initial	After wash
y sample and tare=	727.00	161.60
re =	156.10	156.00
y sample weight =	570.90	5.60

nus #200 from wash= 99.0 %
eve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.10	0.00	100.0
# 40	1.40	0.00	99.7
# 100	2.60	0.00	99.3
# 200	1.80	0.00	99.0

Hydrometer Analysis Data

paration sieve is number 200
rcent -#200 based on complete sample= 99.0
ight of hydrometer sample: 50
lculated biased weight= 50.52
tomatic temperature correction
Composite correction at 20 deg C =-6.5

niscus correction only= 1
ecific gravity of solids= 2.74
ecific gravity correction factor= 0.980
drometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

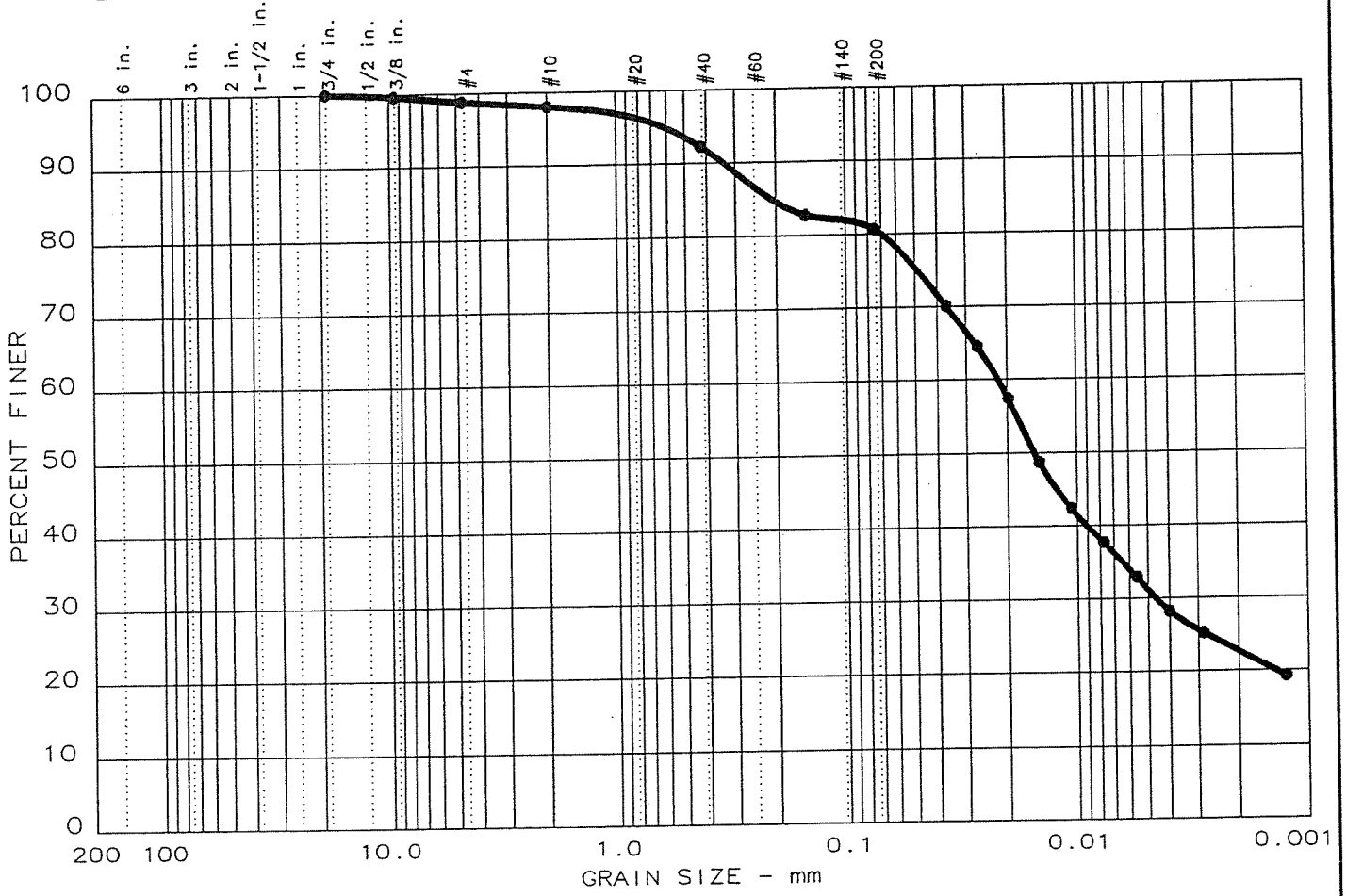
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.5	48.0	41.8	0.0130	49.0	8.3	0.0375	81.1
2.0	21.5	43.0	36.8	0.0130	44.0	9.1	0.0278	71.4
4.0	21.5	34.0	27.8	0.0130	35.0	10.6	0.0212	53.9
8.0	21.5	28.5	22.3	0.0130	29.5	11.5	0.0156	43.3
16.0	21.5	24.0	17.8	0.0130	25.0	12.2	0.0114	34.5
32.0	21.5	20.5	14.3	0.0130	21.5	12.8	0.0082	27.7
64.0	21.5	19.5	13.3	0.0130	20.5	12.9	0.0059	25.8
128.0	21.5	16.5	10.3	0.0130	17.5	13.4	0.0042	20.0
256.0	22.0	15.0	8.9	0.0130	16.0	13.7	0.0030	17.3
1440.0	21.0	13.5	7.2	0.0131	14.5	13.9	0.0013	13.9

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 1.0
SILT = 75.8 % CLAY = 23.2

D85= 0.05 D60= 0.023 D50= 0.019
D30= 0.0094 D15= 0.00168

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	1.2	18.1	49.5	31.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	30.9	16.2	0.209		0.0153	0.0046				

MATERIAL DESCRIPTION	USCS	AASHTO
● Lt. Brown clayey sandy SILT, trace gravel	CL	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-3/S-2

Date: 2/22/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 5

Date: 2/22/05
Project No.: 946-02-000
roject: Vernon Co. Clay test pit

Sample Data

Location of Sample: TP-3/S-2
ample Description: Lt. Brown clayey sandy SILT, trace gravel
USCS Class: CL Liquid limit: 30.9
AASHTO Class: Plasticity index: 16.2

Notes

emarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
ry sample and tare=	784.00	279.30
are =	156.00	155.90
Dry sample weight =	628.00	123.40

Minus #200 from wash= 80.4 %
ieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	2.60	0.00	99.6
# 4	5.20	0.00	98.8
# 10	4.90	0.00	98.0
# 40	36.00	0.00	92.2
# 100	59.80	0.00	82.7
# 200	12.70	0.00	80.7

Hydrometer Analysis Data

eparation sieve is number 200
ercent -#200 based on complete sample= 80.7
Weight of hydrometer sample: 50
alculated biased weight= 61.96
utomatic temperature correction
Composite correction at 20 deg C =-6.5

eniscus correction only= 1
pecific gravity of solids= 2.74
Specific gravity correction factor= 0.980
ydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

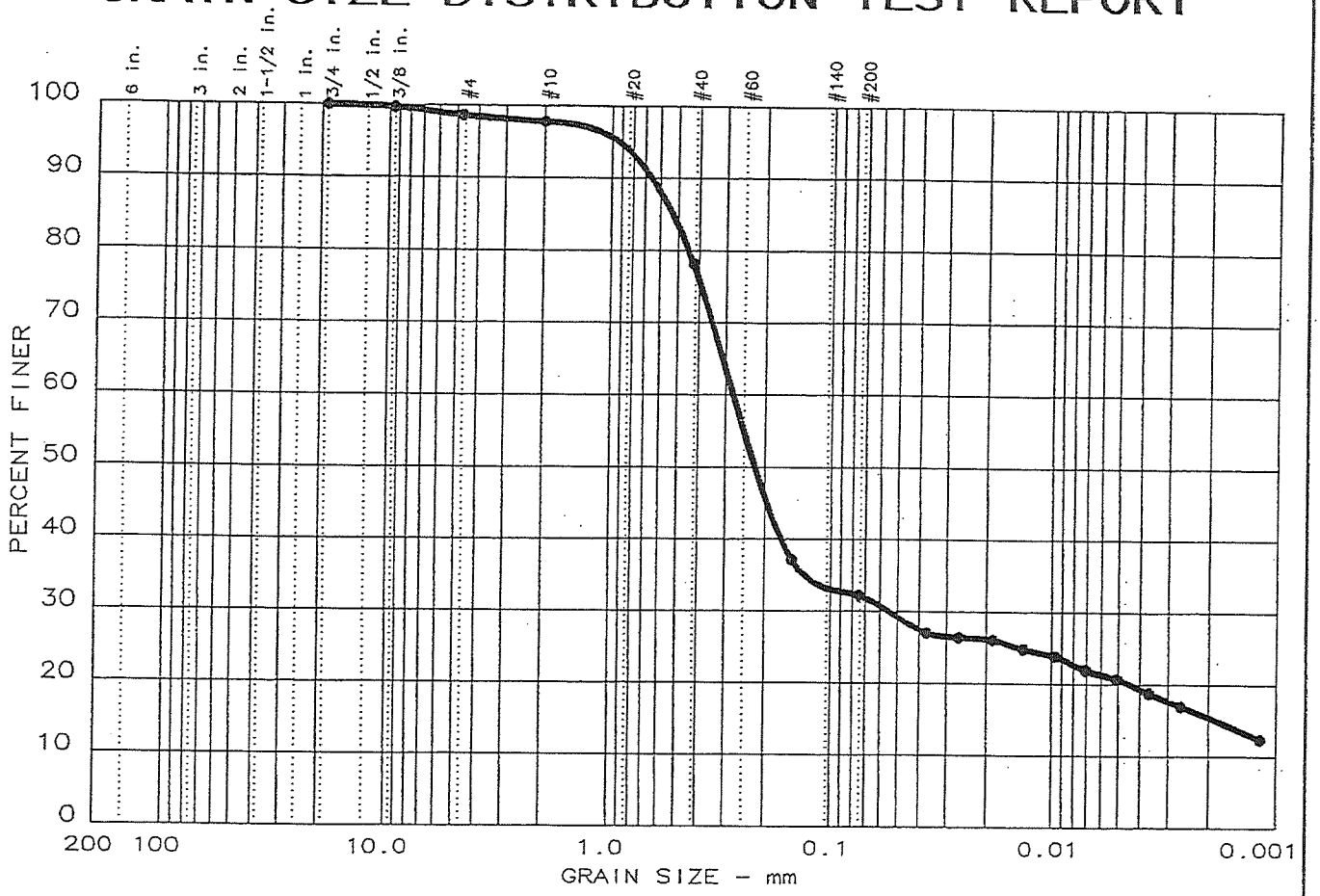
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.5	50.5	44.3	0.0130	51.5	7.8	0.0365	70.1
2.0	21.5	47.0	40.8	0.0130	48.0	8.4	0.0268	64.6
4.0	21.5	42.5	36.3	0.0130	43.5	9.2	0.0197	57.4
8.0	21.5	37.0	30.8	0.0130	38.0	10.1	0.0146	48.7
16.0	21.5	33.0	26.8	0.0130	34.0	10.7	0.0107	42.4
32.0	21.5	30.0	23.8	0.0130	31.0	11.2	0.0077	37.6
64.0	21.5	27.0	20.8	0.0130	28.0	11.7	0.0056	32.9
128.0	21.5	24.0	17.8	0.0130	25.0	12.2	0.0040	28.2
256.0	22.0	22.0	15.9	0.0130	23.0	12.5	0.0029	25.2
1440.0	21.0	18.5	12.2	0.0131	19.5	13.1	0.0013	19.3

Fractional Components

avel/Sand based on #4 sieve
nd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 1.2 % SAND = 18.1
SILT = 49.5 % CLAY = 31.2

5= 0.21 D60= 0.022 D50= 0.015
0= 0.0046

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	1.4	66.4	11.6	20.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	29.7	13.0	0.525	0.277	0.221	0.0543	0.0018			

MATERIAL DESCRIPTION	USCS	AASHTO
● Brown clayey SAND, little silt, trace gravel	SC	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-3/S-3

Date: 2/23/05

Remarks:

Clay cover

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 6

ate: 2/23/05
roject No.: 946-02-000
roject: Vernon Co. Clay test pit

Sample Data

ocation of Sample: TP-3/S-3
ample Description: Brown clayey SAND, little silt, trace gravel
SCS Class: SC
ASHTO Class:
Liquid limit: 29.7
Plasticity index: 13.0

Notes

emarks: Clay cover

ig. No.: 1

Mechanical Analysis Data

	Initial	After wash
ry sample and tare=	616.00	471.60
are =	156.00	155.90
ry sample weight =	460.00	315.70

inus #200 from wash= 31.4 %
ieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	1.50	0.00	99.7
# 4	4.80	0.00	98.6
# 10	3.90	0.00	97.8
# 40	90.00	0.00	78.2
# 100	189.10	0.00	37.1
# 200	22.60	0.00	32.2

Hydrometer Analysis Data

eparation sieve is number 200
ercent -#200 based on complete sample= 32.2
eight of hydrometer sample: 50
alculated biased weight= 155.30
utomatic temperature correction
Composite correction at 20 deg C =-6.5

eniscus correction only= 1
pecific gravity of solids= 2.74
pecific gravity correction factor= 0.980
ydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

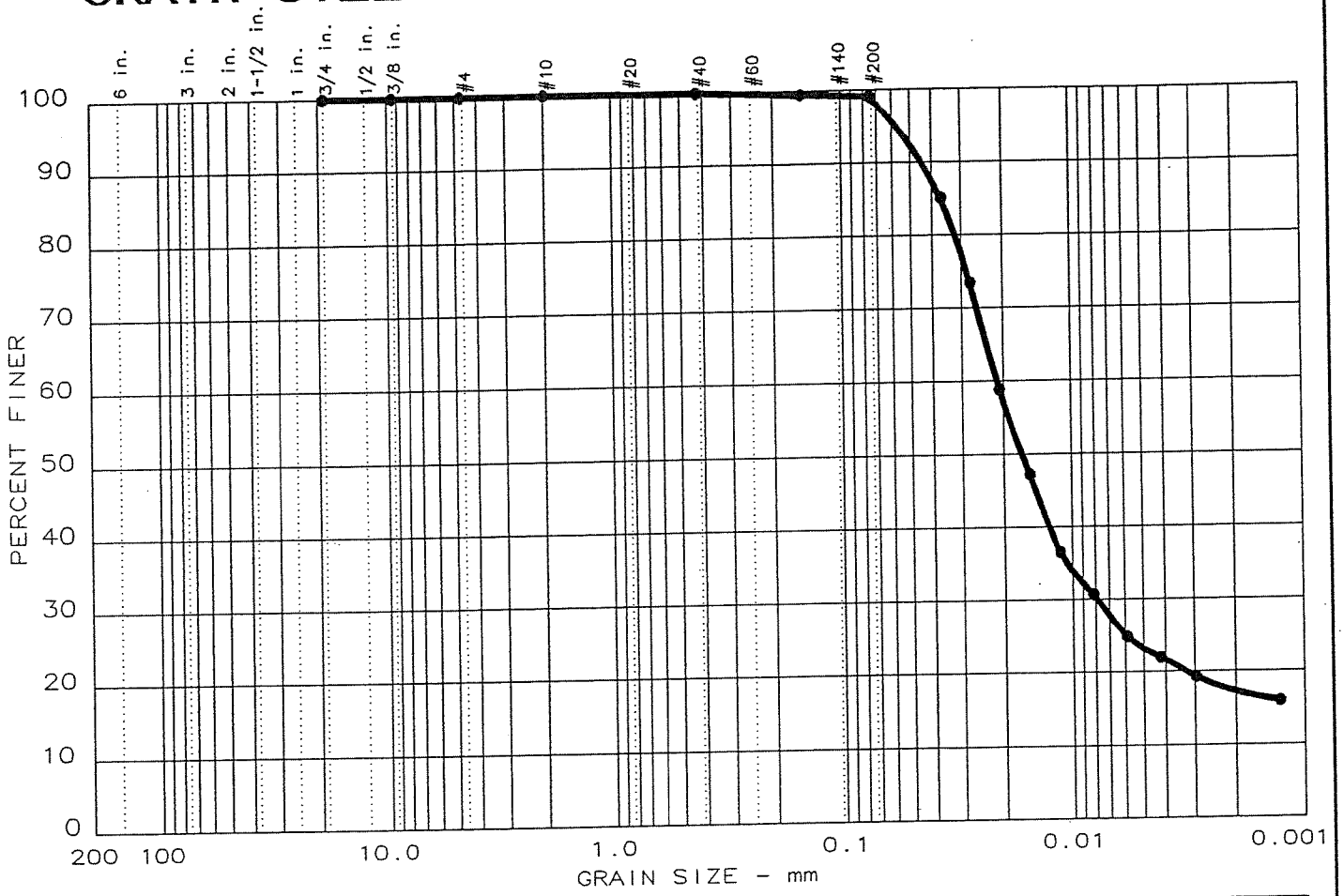
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.5	49.0	42.8	0.0130	50.0	8.1	0.0371	27.0
2.0	21.5	48.0	41.8	0.0130	49.0	8.3	0.0265	26.4
4.0	21.5	47.5	41.3	0.0130	48.5	8.3	0.0188	26.1
8.0	21.5	45.5	39.3	0.0130	46.5	8.7	0.0136	24.8
16.0	21.5	44.0	37.8	0.0130	45.0	8.9	0.0097	23.9
32.0	21.5	41.0	34.8	0.0130	42.0	9.4	0.0071	22.0
64.0	21.5	39.0	32.8	0.0130	40.0	9.7	0.0051	20.7
128.0	21.5	36.0	29.8	0.0130	37.0	10.2	0.0037	18.8
256.0	22.0	33.0	26.9	0.0130	34.0	10.7	0.0027	17.0
1440.0	21.0	26.0	19.7	0.0131	27.0	11.9	0.0012	12.4

Fractional Components

ravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 1.4 % SAND = 66.4
SILT = 11.6 % CLAY = 20.6

D85= 0.52 D60= 0.277 D50= 0.221
30= 0.0543 D15= 0.00184

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.0	0.9	75.9	23.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	40.2	18.4			0.0166	0.0078				

MATERIAL DESCRIPTION	USCS	AASHTO
● yellowish brown clayey SILT, trace sand	CL	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-4/S-1

Date: 2/23/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 7

Date: 2/23/05
Project No.: 946-02-000
roject: Vernon Co. Clay test pit

Sample Data

ocation of Sample: TP-4/S-1
ample Description: yellowish brown clayey SILT, trace sand
USCS Class: CL Liquid limit: 40.2
AASHTO Class: Plasticity index: 18.4

Notes

emarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
ry sample and tare=	817.00	162.70
are =	156.40	156.40
Dry sample weight =	660.60	6.30

Minus #200 from wash= 99.0 %
ieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.00	0.00	100.0
# 40	0.70	0.00	99.9
# 100	3.20	0.00	99.4
# 200	2.10	0.00	99.1

Hydrometer Analysis Data

eparation sieve is number 200
ercent -#200 based on complete sample= 99.1
Weight of hydrometer sample: 50
alculated biased weight= 50.46
utomatic temperature correction
Composite correction at 20 deg C =-6.5

eniscus correction only= 1
pecific gravity of solids= 2.74
Specific gravity correction factor= 0.980
ydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

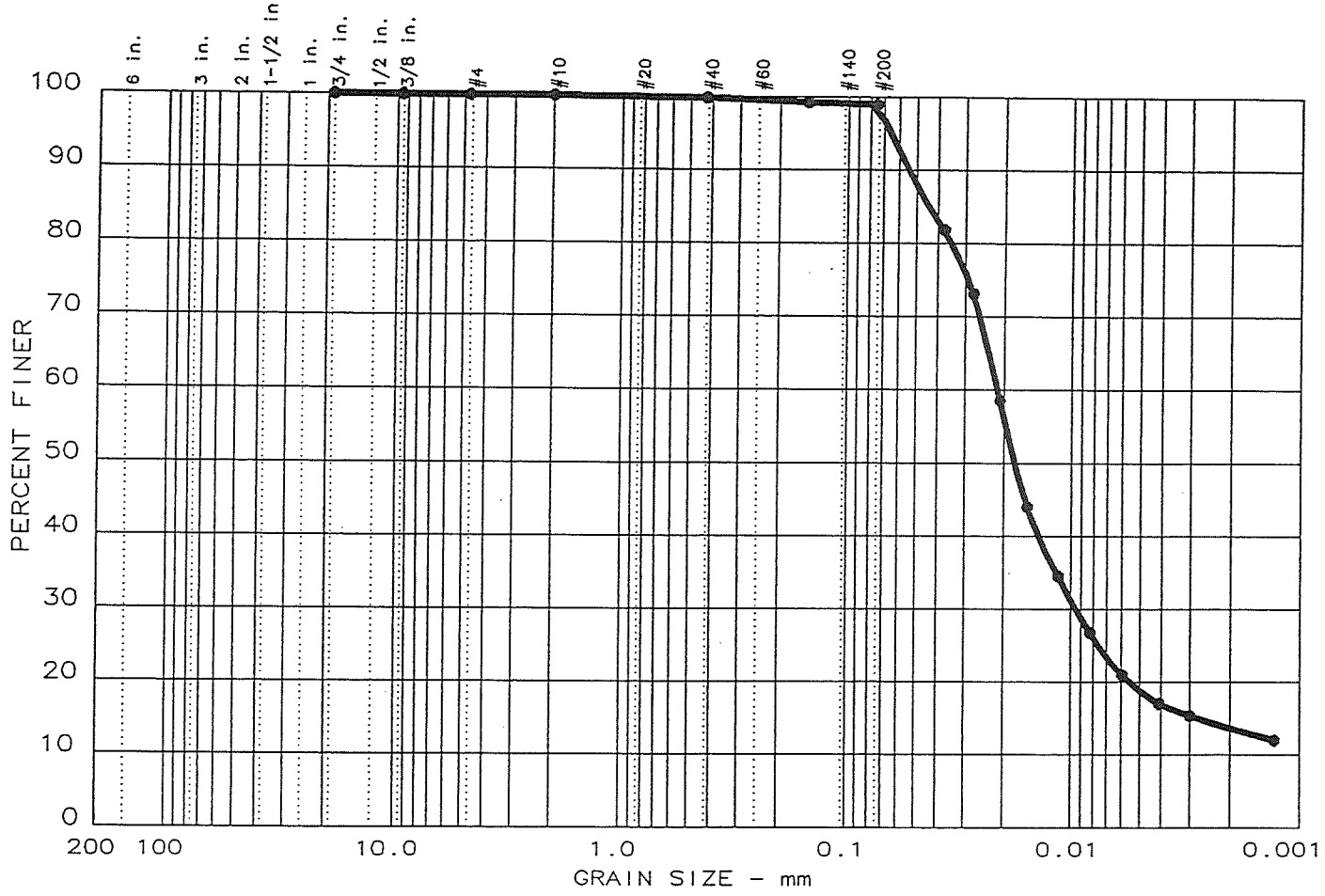
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.5	50.0	43.8	0.0130	51.0	7.9	0.0367	85.1
2.0	21.5	44.0	37.8	0.0130	45.0	8.9	0.0275	73.4
4.0	21.5	36.5	30.3	0.0130	37.5	10.1	0.0208	58.9
8.0	21.5	30.5	24.3	0.0130	31.5	11.1	0.0154	47.2
16.0	21.5	25.0	18.8	0.0130	26.0	12.0	0.0113	36.5
32.0	21.5	22.0	15.8	0.0130	23.0	12.5	0.0082	30.7
64.0	21.5	19.0	12.8	0.0130	20.0	13.0	0.0059	24.9
128.0	21.5	17.5	11.3	0.0130	18.5	13.3	0.0042	21.9
256.0	22.0	16.0	9.9	0.0130	17.0	13.5	0.0030	19.3
1440.0	21.0	14.5	8.2	0.0131	15.5	13.8	0.0013	15.9

Fractional Components

avel/Sand based on #4 sieve
nd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 0.9
SILT = 75.9 % CLAY = 23.2

5= 0.04 D60= 0.021 D50= 0.017
0= 0.0078

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.0	1.0	80.1	18.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	29.7	7.4			0.0178	0.0094	0.0028			

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellowish brown clayey SILT, trace of sand	CL	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-4/S-2

Date: 3/01/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 8

te: 3/01/05
oject No.: 946-02-000
oject: Vernon Co. Clay test pit

Sample Data

cation of Sample: TP-4/S-2
mple Description: Yellowish brown clayey SILT, trace of sand
CS Class: CL Liquid limit: 29.7
SHTO Class: Plasticity index: 7.4

Notes

marks: Clay cover

g. No.: 1

Mechanical Analysis Data

	Initial	After wash
y sample and tare=	806.00	163.30
re =	156.10	156.00
y sample weight =	649.90	7.30
nus #200 from wash=	98.9 %	

eve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.10	0.00	100.0
# 10	0.10	0.00	100.0
# 40	1.20	0.00	99.8
# 100	3.70	0.00	99.2
# 200	1.80	0.00	98.9

Hydrometer Analysis Data

paration sieve is number 200
rcent -#200 based on complete sample= 98.9
ight of hydrometer sample: 50
lculated biased weight= 50.54
tomatic temperature correction
Composite correction at 20 deg C =-6.5

niscus correction only= 1
ecific gravity of solids= 2.74
ecific gravity correction factor= 0.980
drometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

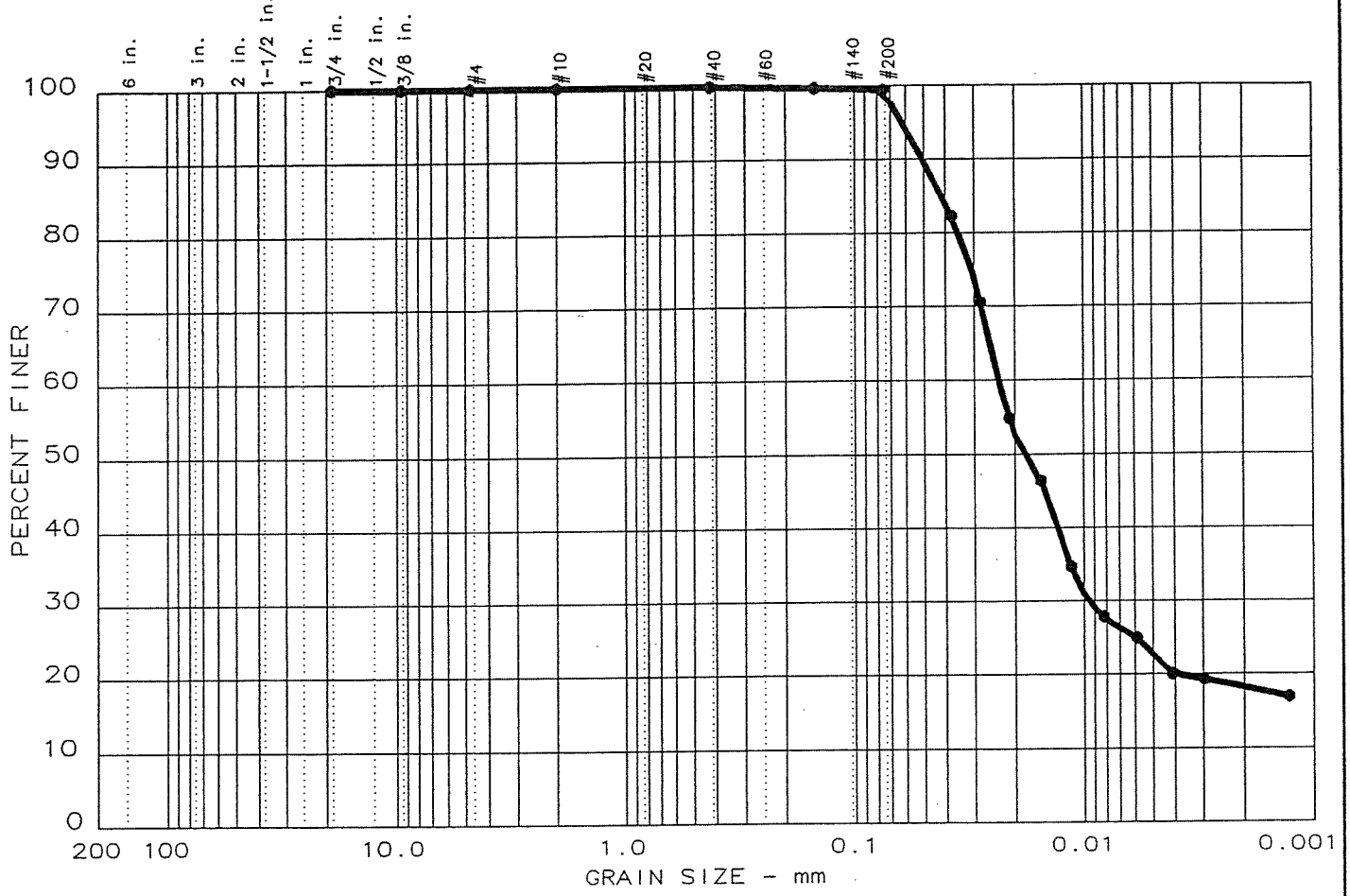
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.0	48.5	42.2	0.0131	49.5	8.2	0.0375	81.8
2.0	21.0	44.0	37.7	0.0131	45.0	8.9	0.0277	73.1
4.0	21.0	36.5	30.2	0.0131	37.5	10.1	0.0209	58.5
8.0	21.0	29.0	22.7	0.0131	30.0	11.4	0.0156	44.0
16.0	21.5	24.0	17.8	0.0130	25.0	12.2	0.0114	34.5
32.0	21.5	20.0	13.8	0.0130	21.0	12.9	0.0083	26.8
64.0	21.5	17.0	10.8	0.0130	18.0	13.3	0.0060	20.9
138.0	21.5	15.0	8.8	0.0130	16.0	13.7	0.0041	17.1
256.0	22.0	14.0	7.9	0.0130	15.0	13.8	0.0030	15.3
1440.0	21.0	12.5	6.2	0.0131	13.5	14.1	0.0013	12.0

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 1.0
% SILT = 80.1 % CLAY = 18.9

D85= 0.04 D60= 0.021 D50= 0.018
D30= 0.0094 D15= 0.00279

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.0	0.6	76.7	22.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	37.6	14.7			0.0180	0.0095				

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellowish brown clayey SILT, trace of sand	CL	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-5/S-1

Date: 3/01/05

Remarks:
Clay cover

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 9

Date: 3/01/05
Project No.: 946-02-000
Project: Vernon Co. Clay test pit

Sample Data

Location of Sample: TP-5/S-1
Sample Description: Yellowish brown clayey SILT, trace of sand
USCS Class: CL Liquid limit: 37.6
AASHTO Class: Plasticity index: 14.7

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	803.00	160.20
Tare =	156.00	156.00
Dry sample weight =	647.00	4.20
Minus #200 from wash=	99.4 %	

Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.00	0.00	100.0
# 40	0.20	0.00	100.0
# 100	1.90	0.00	99.7
# 200	1.80	0.00	99.4

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 99.4
Weight of hydrometer sample: 50
Calculated biased weight= 50.30
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

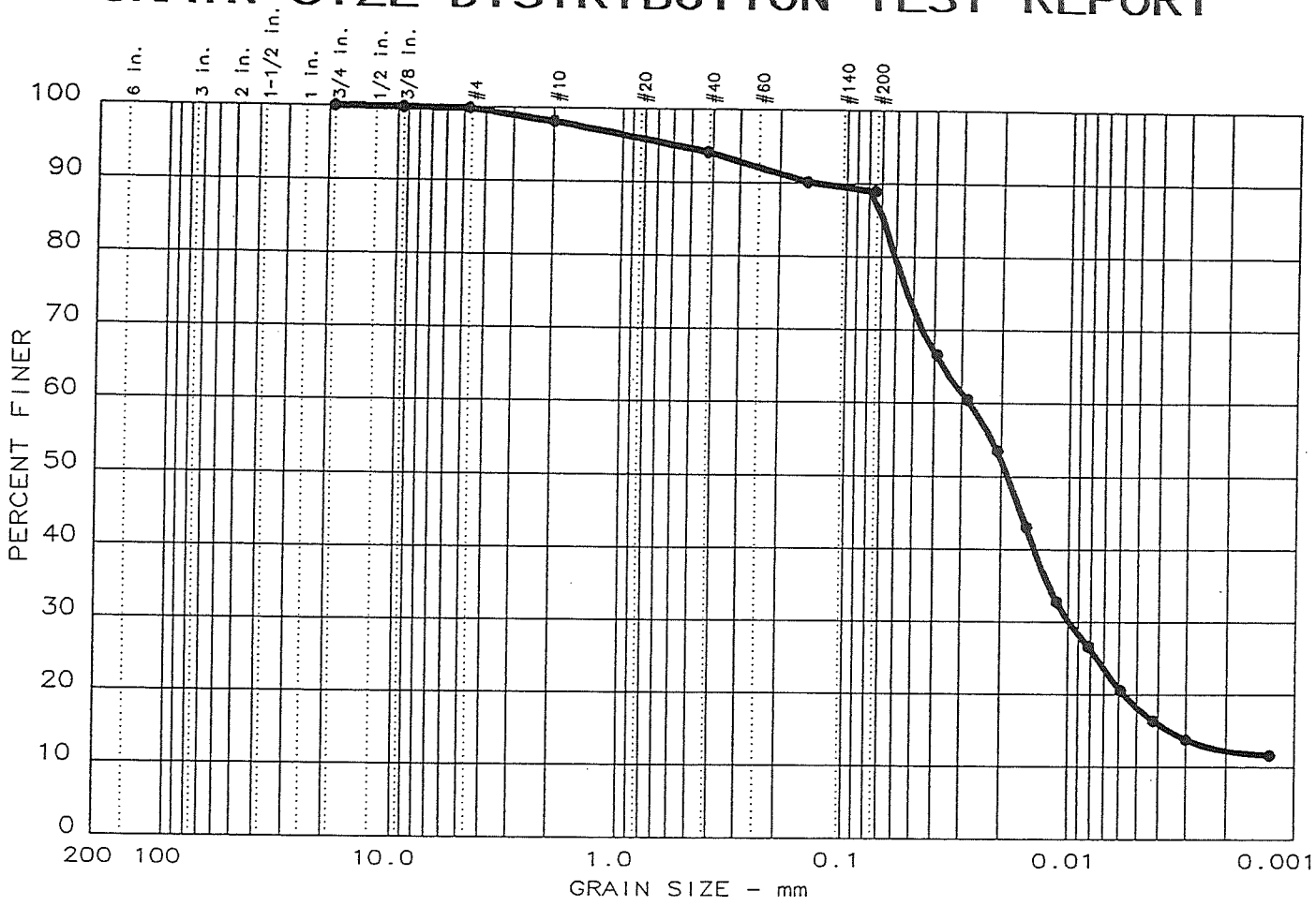
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.0	48.5	42.2	0.0131	49.5	8.2	0.0375	82.2
2.0	21.0	42.5	36.2	0.0131	43.5	9.2	0.0281	70.5
4.0	21.0	34.5	28.2	0.0131	35.5	10.5	0.0212	54.9
8.0	21.5	30.0	23.8	0.0130	31.0	11.2	0.0154	46.4
16.0	21.5	24.0	17.8	0.0130	25.0	12.2	0.0114	34.7
32.0	21.5	20.5	14.3	0.0130	21.5	12.8	0.0082	27.9
64.0	21.5	19.0	12.8	0.0130	20.0	13.0	0.0059	24.9
134.0	21.5	16.5	10.3	0.0130	17.5	13.4	0.0041	20.1
256.0	22.0	16.0	9.9	0.0130	17.0	13.5	0.0030	19.3
1440.0	21.0	15.0	8.7	0.0131	16.0	13.7	0.0013	16.9

Fractional Components

avel/Sand based on #4 sieve
nd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 0.6
SILT = 76.7 % CLAY = 22.7

5= 0.04 D60= 0.023 D50= 0.018
0= 0.0095

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.2	10.9	70.8	18.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	25.1	4.5			0.0186	0.0099	0.0036			

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellowbrown clayey SILT, Lt sand, trace gravel	CL-ML	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-5/S-2

Date: 3/02/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 10

ıte: 3/02/05
:oject No.: 946-02-000
:oject: Vernon Co. Clay test pit

Sample Data

)cation of Sample: TP-5/S-2
ımple Description: Yellowbrown clayey SILT, Lt sand, trace gravel
3CS Class: CL-ML Liquid limit: 25.1
ASHTO Class: Plasticity index: 4.5

Notes

:marks: Clay cover

.g. No.: 1

Mechanical Analysis Data

	Initial	After wash
:y sample and tare=	807.00	203.30
ıre =	156.10	156.00
:y sample weight =	650.90	47.30
.nus #200 from wash=	92.7 %	

.eve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.80	0.00	99.9
# 4	0.40	0.00	99.8
# 10	10.90	0.00	98.1
# 40	25.90	0.00	94.2
# 100	26.20	0.00	90.1
# 200	7.80	0.00	88.9

Hydrometer Analysis Data

:paration sieve is number 200
:rcent -#200 based on complete sample= 88.9
:ight of hydrometer sample: 50
ılculated biased weight= 56.22
ıtomatic temperature correction
Composite correction at 20 deg C =-6.5

:niscus correction only= 1
)ecific gravity of solids= 2.74
)ecific gravity correction factor= 0.980
/drometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

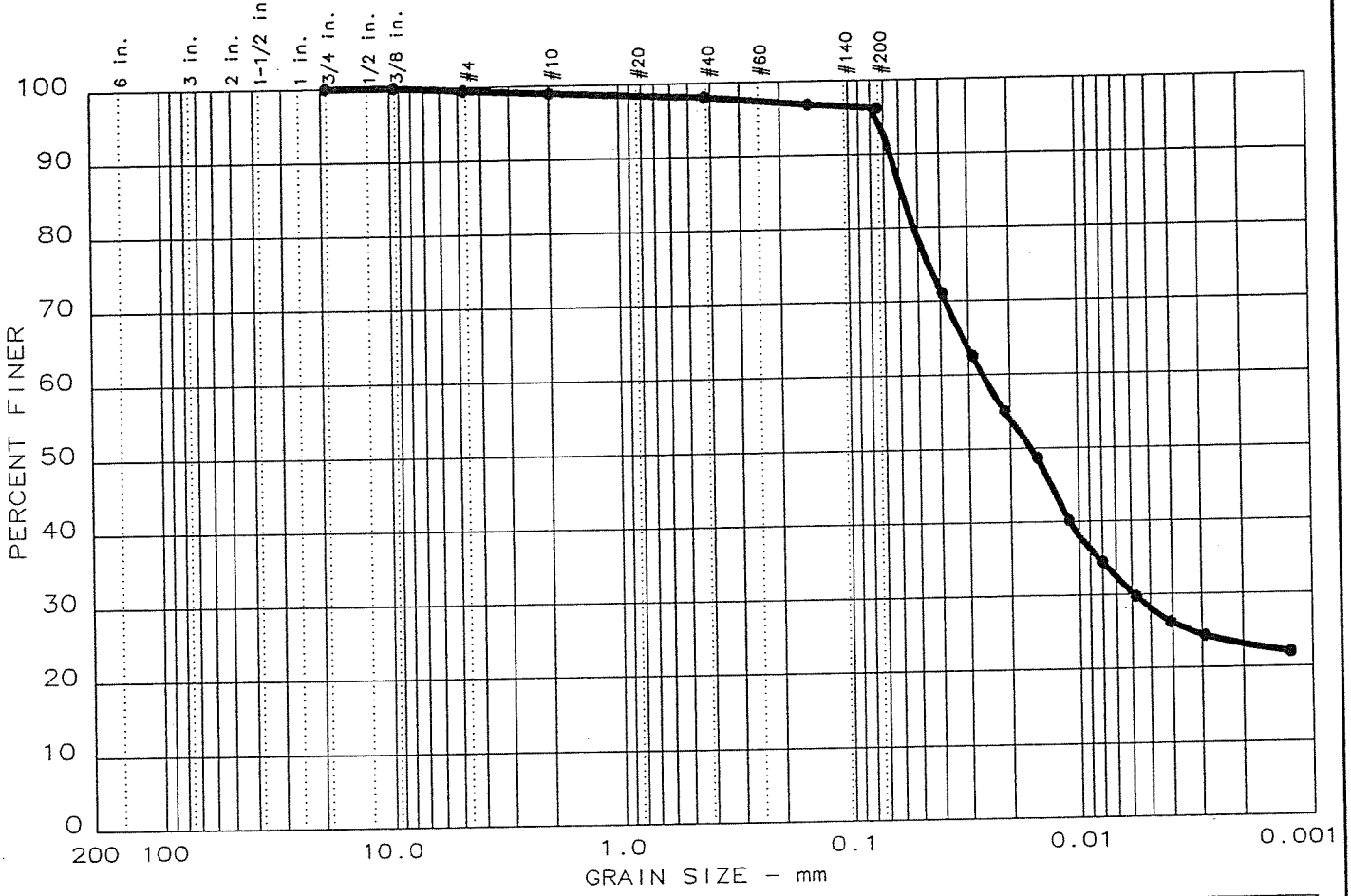
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.0	44.5	38.2	0.0131	45.5	8.8	0.0390	66.6
2.0	21.0	41.0	34.7	0.0131	42.0	9.4	0.0285	60.5
4.0	21.0	37.0	30.7	0.0131	38.0	10.1	0.0208	53.5
8.0	21.0	31.0	24.7	0.0131	32.0	11.0	0.0154	43.0
16.0	21.5	25.0	18.8	0.0130	26.0	12.0	0.0113	32.8
32.0	21.5	21.5	15.3	0.0130	22.5	12.6	0.0082	26.7
64.0	21.5	18.0	11.8	0.0130	19.0	13.2	0.0059	20.6
128.0	22.0	15.5	9.4	0.0130	16.5	13.6	0.0042	16.4
256.0	22.0	14.0	7.9	0.0130	15.0	13.8	0.0030	13.8
1440.0	21.0	13.0	6.7	0.0131	14.0	14.0	0.0013	11.6

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.2 % SAND = 10.9
SILT = 70.8 % CLAY = 18.1

D85= 0.07 D60= 0.028 D50= 0.019
D30= 0.0099 D15= 0.00359

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.5	3.3	68.1	28.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	42.9	21.1			0.0161	0.0059				

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellowbrown clayey SILT, trace sand & gravel	CL	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-6/S-1

Date: 3/02/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 11

Date: 3/02/05
Project No.: 946-02-000
roject: Vernon Co. Clay test pit

Sample Data

ocation of Sample: TP-6/S-1
ample Description: Yellowbrown clayey SILT, trace sand & gravel
USCS Class: CL Liquid limit: 42.9
AASHTO Class: Plasticity index: 21.1

Notes

emarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
ry sample and tare=	808.00	180.00
are =	154.70	154.60
Dry sample weight =	653.30	25.40

inus #200 from wash= 96.1 %
ieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	3.40	0.00	99.5
# 10	3.70	0.00	98.9
# 40	5.50	0.00	98.1
# 100	8.40	0.00	96.8
# 200	4.00	0.00	96.2

Hydrometer Analysis Data

eparation sieve is number 200
ercent -#200 based on complete sample= 96.2
Weight of hydrometer sample: 50
alculated biased weight= 51.99
utomatic temperature correction
Composite correction at 20 deg C =-6.5

eniscus correction only= 1
pecific gravity of solids= 2.74
Specific gravity correction factor= 0.980
ydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

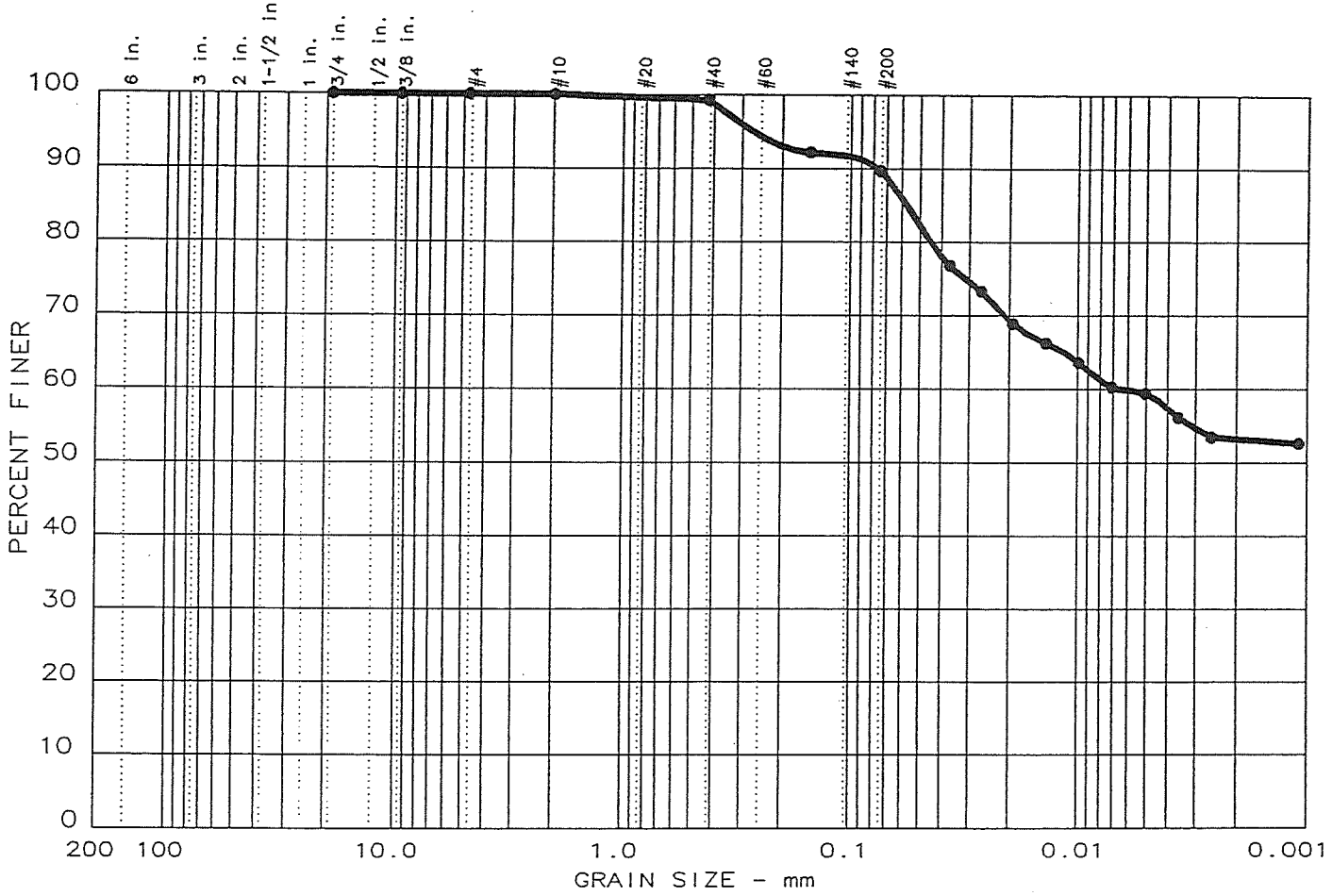
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.0	44.0	37.7	0.0131	45.0	8.9	0.0392	71.1
2.0	21.0	39.5	33.2	0.0131	40.5	9.7	0.0288	62.6
4.0	21.0	35.5	29.2	0.0131	36.5	10.3	0.0211	55.0
8.0	21.5	32.0	25.8	0.0130	33.0	10.9	0.0152	48.6
16.0	21.5	27.5	21.3	0.0130	28.5	11.6	0.0111	40.2
32.0	21.5	24.5	18.3	0.0130	25.5	12.1	0.0080	34.5
64.0	21.5	22.0	15.8	0.0130	23.0	12.5	0.0058	29.8
128.0	22.0	20.0	13.9	0.0130	21.0	12.9	0.0041	26.2
256.0	22.0	19.0	12.9	0.0130	20.0	13.0	0.0029	24.3
1440.0	21.0	18.0	11.7	0.0131	19.0	13.2	0.0013	22.0

Fractional Components

avel/Sand based on #4 sieve
nd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.5 % SAND = 3.3
SILT = 68.1 % CLAY = 28.1

5= 0.06 D60= 0.026 D50= 0.016
0= 0.0059

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.0	10.3	30.3	59.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	74.9	46.8								

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellowbrown silty CLAY, little sand	CH	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-6/S-2

Date: 3/03/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 12

ıte: 3/03/05
:oject No.: 946-02-000
:oject: Vernon Co. Clay test pit

Sample Data

)cation of Sample: TP-6/S-2
ımple Description: Yellowbrown silty CLAY, little sand
;CS Class: CH Liquid limit: 74.9
ıSHTO Class: Plasticity index: 46.8

Notes

ɜmarks: Clay cover

.g. No.: 1

Mechanical Analysis Data

	Initial	After wash
:y sample and tare=	800.00	221.90
ıre =	154.40	154.50
:y sample weight =	645.60	67.40
ınus #200 from wash=	89.6 %	

ɩeve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.10	0.00	100.0
# 40	4.60	0.00	99.3
# 100	45.30	0.00	92.3
# 200	16.30	0.00	89.7

Hydrometer Analysis Data

ɜparation sieve is number 200
ɜrcent -#200 based on complete sample= 89.7
ɜight of hydrometer sample: 50
ɜlculated biased weight= 55.72
ɪtomatic temperature correction
Composite correction at 20 deg C =-6.5

ɜniscus correction only= 1
ɔecific gravity of solids= 2.74
ɔecific gravity correction factor= 0.980
ɣdrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

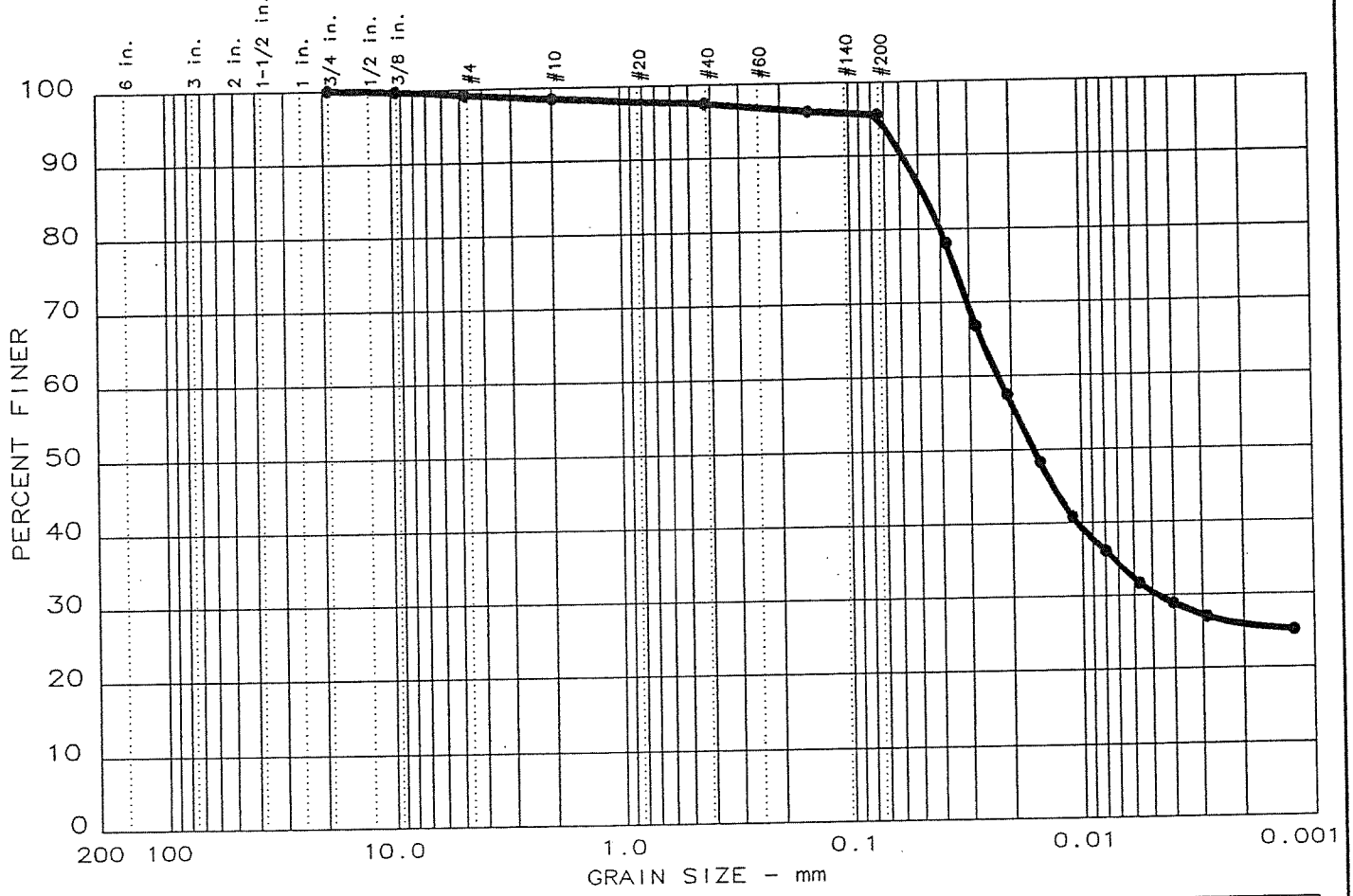
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.0	50.0	43.7	0.0131	51.0	7.9	0.0370	76.9
2.0	21.0	48.0	41.7	0.0131	49.0	8.3	0.0267	73.3
4.0	21.0	45.5	39.2	0.0131	46.5	8.7	0.0193	68.9
8.0	21.0	44.0	37.7	0.0131	45.0	8.9	0.0139	66.3
16.0	21.0	42.5	36.2	0.0131	43.5	9.2	0.0099	63.7
32.0	21.5	40.5	34.3	0.0130	41.5	9.5	0.0071	60.3
64.0	21.5	40.0	33.8	0.0130	41.0	9.6	0.0050	59.5
128.0	22.0	38.0	31.9	0.0130	39.0	9.9	0.0036	56.1
256.0	22.0	36.5	30.4	0.0130	37.5	10.1	0.0026	53.5
1440.0	22.0	36.0	29.9	0.0130	37.0	10.2	0.0011	52.6

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 10.3
% SILT = 30.3 % CLAY = 59.4

D85= 0.06 D60= 0.006

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.9	3.6	65.2	30.3

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	43.9	23.9			0.0161	0.0048				

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellowbrown clayey SILT, trace sand & gravel	CL	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-7/S-1

Date: 3/03/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 13

Date: 3/03/05
Project No.: 946-02-000
roject: Vernon Co. Clay test pit

Sample Data

ocation of Sample: TP-7/S-1
ample Description: Yellowbrown clayey SILT, trace sand & gravel
USCS Class: CL Liquid limit: 43.9
AASHTO Class: Plasticity index: 23.9

Notes

emarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
ry sample and tare=	803.00	185.80
are =	156.20	156.10
Dry sample weight =	646.80	29.70

Minus #200 from wash= 95.4 %
ieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	1.80	0.00	99.7
# 4	3.70	0.00	99.1
# 10	4.50	0.00	98.5
# 40	6.70	0.00	97.4
# 100	8.30	0.00	96.1
# 200	3.80	0.00	95.5

Hydrometer Analysis Data

eparation sieve is number 200
ercent -#200 based on complete sample= 95.5
Weight of hydrometer sample: 50
alculated biased weight= 52.33
utomatic temperature correction
Composite correction at 20 deg C =-6.5

eniscus correction only= 1
pecific gravity of solids= 2.74
Specific gravity correction factor= 0.980
ydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

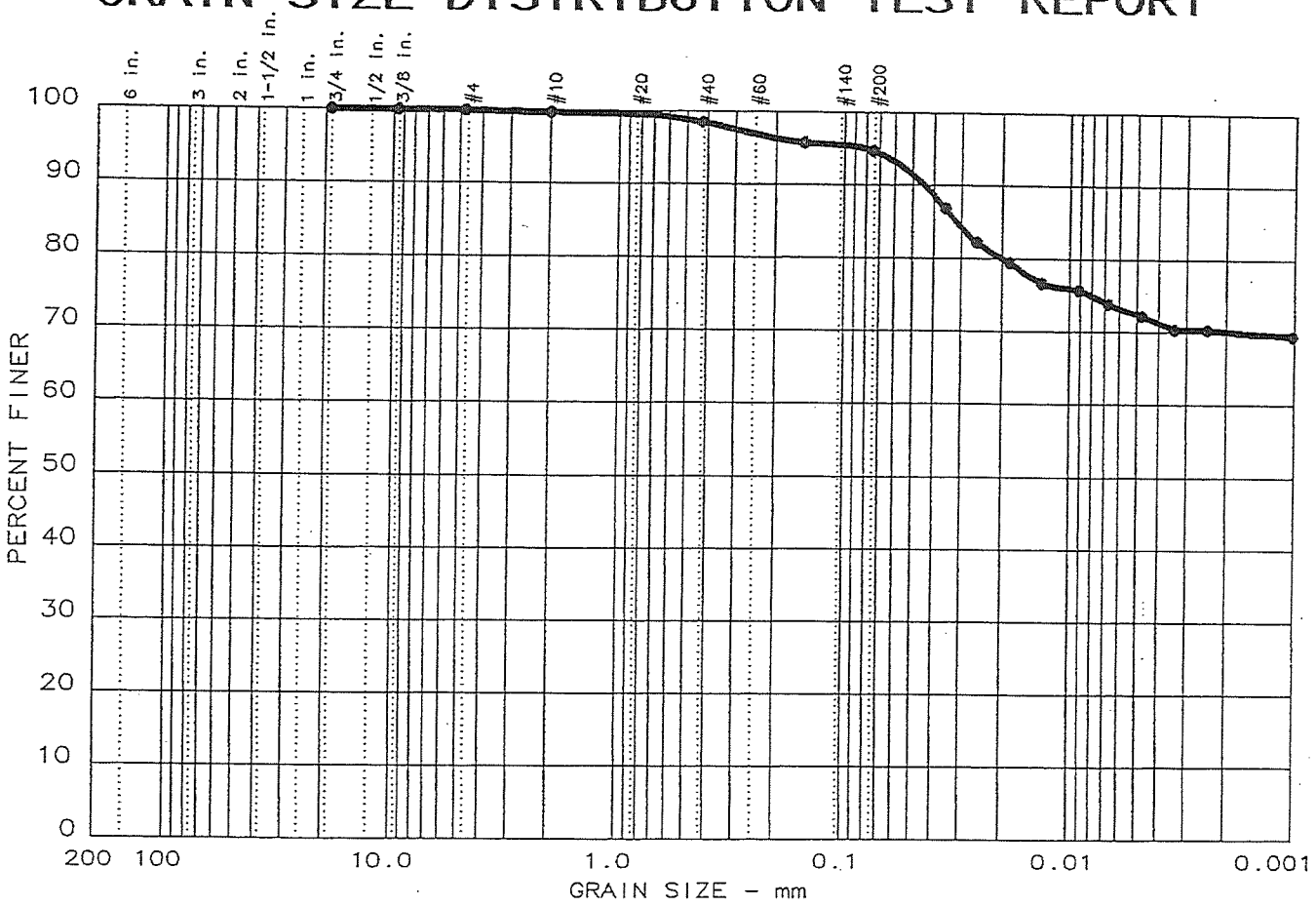
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.0	48.0	41.7	0.0131	49.0	8.3	0.0377	78.1
2.0	21.0	42.0	35.7	0.0131	43.0	9.2	0.0282	66.8
4.0	21.0	37.0	30.7	0.0131	38.0	10.1	0.0208	57.5
8.0	21.5	32.0	25.8	0.0130	33.0	10.9	0.0152	48.3
16.0	21.5	28.0	21.8	0.0130	29.0	11.5	0.0111	40.8
32.0	21.5	25.5	19.3	0.0130	26.5	11.9	0.0080	36.1
64.0	22.0	23.0	16.9	0.0130	24.0	12.4	0.0057	31.7
128.0	22.0	21.5	15.4	0.0130	22.5	12.6	0.0041	28.9
256.0	22.0	20.5	14.4	0.0130	21.5	12.8	0.0029	27.0
1440.0	22.0	19.5	13.4	0.0130	20.5	12.9	0.0012	25.1

Fractional Components

:avel/Sand based on #4 sieve
ınd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.9 % SAND = 3.6
SILT = 65.2 % CLAY = 30.3

35= 0.05 D60= 0.023 D50= 0.016
30= 0.0048

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.1	5.3	22.2	72.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	78.3	39.3								

MATERIAL DESCRIPTION	USCS	AASHTO
● Brown silty CLAY, little sand & gravel	MH	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-7/S-2

Date: 3/03/05

Remarks:

Clay cover

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA

Test No.: 14

Date: 3/03/05
Project No.: 946-02-000
Project: Vernon Co. Clay test pit

Sample Data

Location of Sample: TP-7/S-2
Sample Description: Brown silty CLAY, little sand & gravel
USCS Class: MH
AASHTO Class:
Liquid limit: 78.3
Plasticity index: 39.3

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	802.00	190.90
Tare =	155.60	155.40
Dry sample weight =	646.40	35.50

Minus #200 from wash= 94.5 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.40	0.00	99.9
# 10	1.50	0.00	99.7
# 40	7.80	0.00	98.5
# 100	17.90	0.00	95.7
# 200	6.90	0.00	94.7

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 94.7
Weight of hydrometer sample: 50
Calculated biased weight= 52.82
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

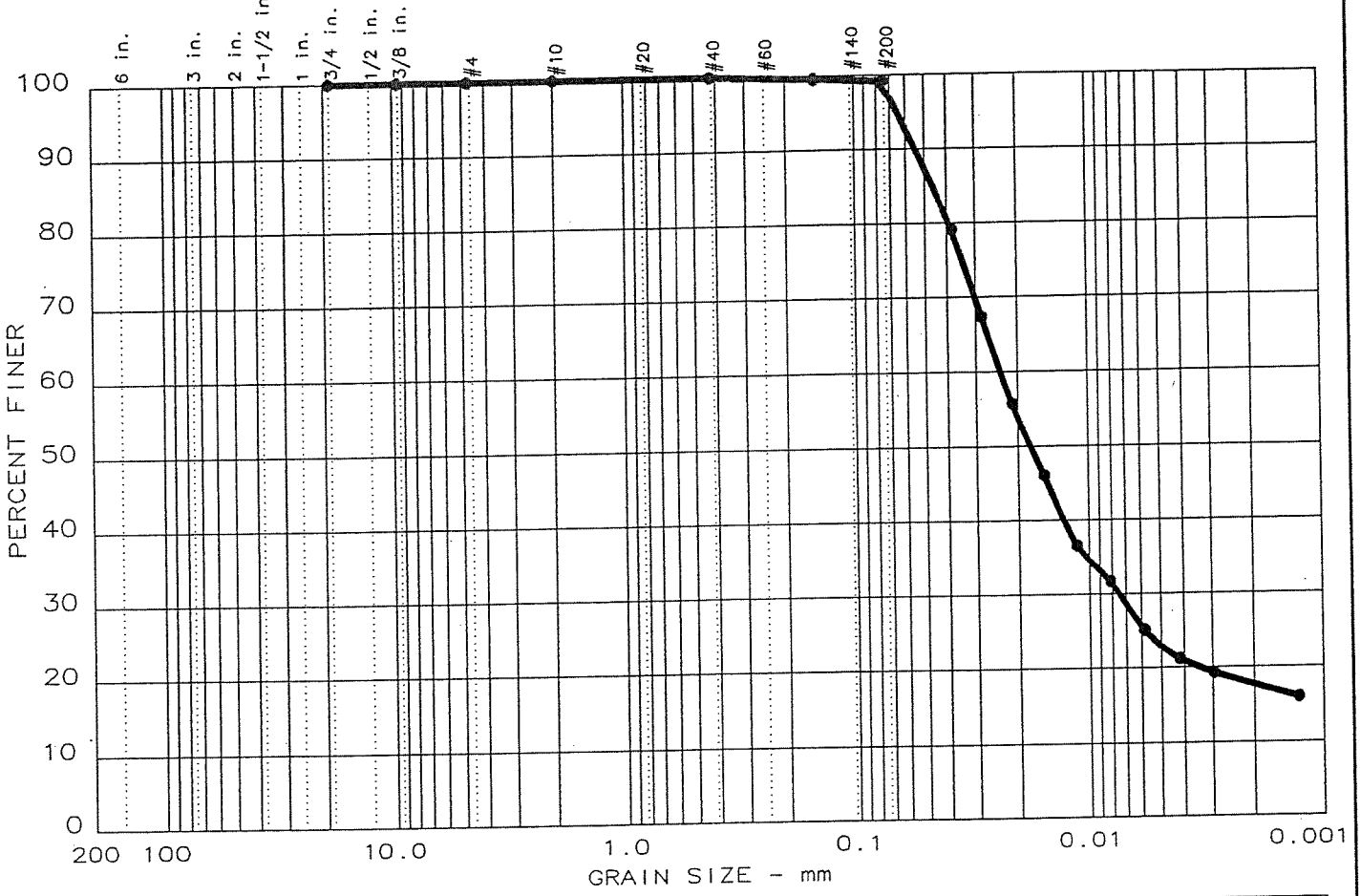
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.5	53.0	46.8	0.0130	54.0	7.4	0.0356	86.9
2.0	21.5	50.5	44.3	0.0130	51.5	7.8	0.0258	82.2
4.0	21.5	49.0	42.8	0.0130	50.0	8.1	0.0186	79.4
8.0	21.5	47.5	41.3	0.0130	48.5	8.3	0.0133	76.6
17.0	21.5	47.0	40.8	0.0130	48.0	8.4	0.0092	75.7
32.0	21.5	46.0	39.8	0.0130	47.0	8.6	0.0068	73.9
64.0	22.0	45.0	38.9	0.0130	46.0	8.8	0.0048	72.2
128.0	22.0	44.0	37.9	0.0130	45.0	8.9	0.0034	70.4
256.0	22.0	44.0	37.9	0.0130	45.0	8.9	0.0024	70.4
1440.0	22.0	43.5	37.4	0.0130	44.5	9.0	0.0010	69.4

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.1 % SAND = 5.3
SILT = 22.2 % CLAY = 72.4

D85= 0.03

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.0	0.8	76.3	22.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	30.7	7.6			0.0177	0.0074				

MATERIAL DESCRIPTION	USCS	AASHTO
● yellow-brown clayey SILT, trace of sand	ML	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-8/S-1

Date: 3/8/05

Remarks:
Clay cover

GRAIN SIZE DISTRIBUTION TEST REPORT
CENTRAL WISCONSIN ENGINEERS, INC.

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 16

Date: 3/8/05
Project No.: 946-02-000
Project: Vernon Co. Clay test pit

Sample Data

Location of Sample: TP-8/S-1
Sample Description: yellow-brown clayey SILT, trace of sand
USCS Class: ML Liquid limit: 30.7
AASHTO Class: Plasticity index: 7.6

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	668.40	160.60
Tare =	155.60	155.60
Dry sample weight =	512.80	5.00

Minus #200 from wash= 99.0 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.00	0.00	100.0
# 40	0.20	0.00	100.0
# 100	2.30	0.00	99.5
# 200	1.80	0.00	99.2

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 99.2
Weight of hydrometer sample: 50
Calculated biased weight= 50.42
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

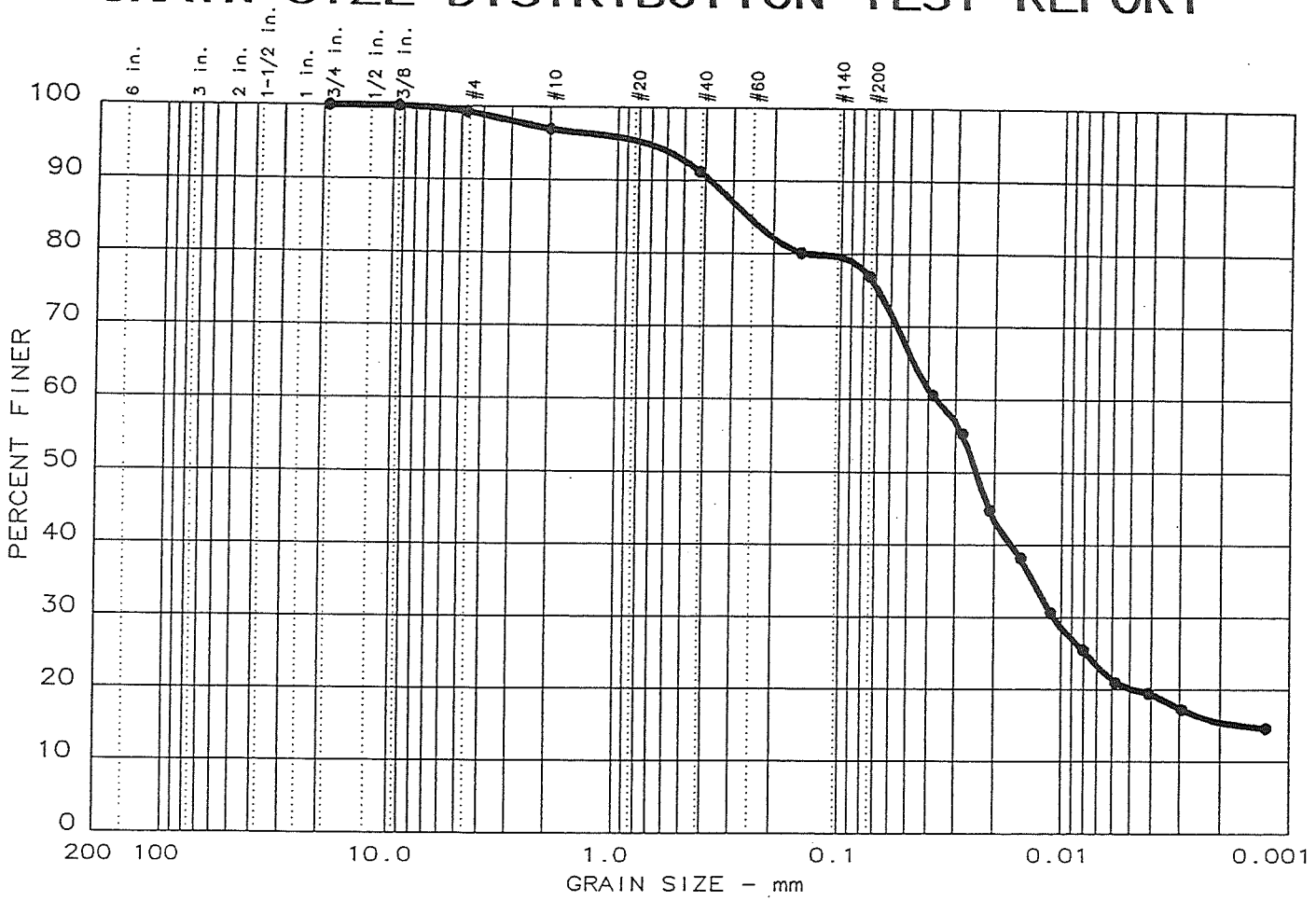
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.0	47.0	40.7	0.0131	48.0	8.4	0.0381	79.1
2.0	21.0	41.0	34.7	0.0131	42.0	9.4	0.0285	67.4
4.0	21.0	35.0	28.7	0.0131	36.0	10.4	0.0212	55.8
8.0	21.0	30.0	23.7	0.0131	31.0	11.2	0.0155	46.0
16.0	21.5	25.0	18.8	0.0130	26.0	12.0	0.0113	36.5
32.0	21.5	22.5	16.3	0.0130	23.5	12.4	0.0081	31.7
64.0	22.0	19.0	12.9	0.0130	20.0	13.0	0.0058	25.1
128.0	22.0	17.0	10.9	0.0130	18.0	13.3	0.0042	21.2
256.0	22.0	16.0	9.9	0.0130	17.0	13.5	0.0030	19.3
1440.0	21.0	14.5	8.2	0.0131	15.5	13.8	0.0013	15.9

Fractional Components

ɔavel/Sand based on #4 sieve
ɜnd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 0.8
SILT = 76.3 % CLAY = 22.9

ɜ5= 0.05 D60= 0.024 D50= 0.018
ɜ0= 0.0074

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.8	22.3	56.8	20.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	61.3	29.9	0.257		0.0241	0.0108	0.0017			

MATERIAL DESCRIPTION	USCS	AASHTO
● yellow-brown clayey sandy SILT, trace of gravel	MH	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-8/S-2

Date: 3/8/05

Remarks:

Clay cover

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 17

te: 3/8/05
oject No.: 946-02-000
oject: Vernon Co. Clay test pit

Sample Data

cation of Sample: TP-8/S-2
mple Description: yellow-brown clayey sandy SILT, trace of gravel
CS Class: MH Liquid limit: 61.3
SHTO Class: Plasticity index: 29.9

Notes

marks: Clay cover

g. No.: 1

Mechanical Analysis Data

	Initial	After wash
y sample and tare=	719.80	286.30
re =	155.90	155.90
y sample weight =	563.90	130.40

nus #200 from wash= 76.9 %
eve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	4.30	0.00	99.2
# 10	12.80	0.00	97.0
# 40	32.40	0.00	91.2
# 100	62.60	0.00	80.1
# 200	17.90	0.00	76.9

Hydrometer Analysis Data

paration sieve is number 200
rcent -#200 based on complete sample= 76.9
ight of hydrometer sample: 50
lculated biased weight= 64.98
tomatic temperature correction
Composite correction at 20 deg C =-6.5

niscus correction only= 1
ecific gravity of solids= 2.74
ecific gravity correction factor= 0.980
drometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

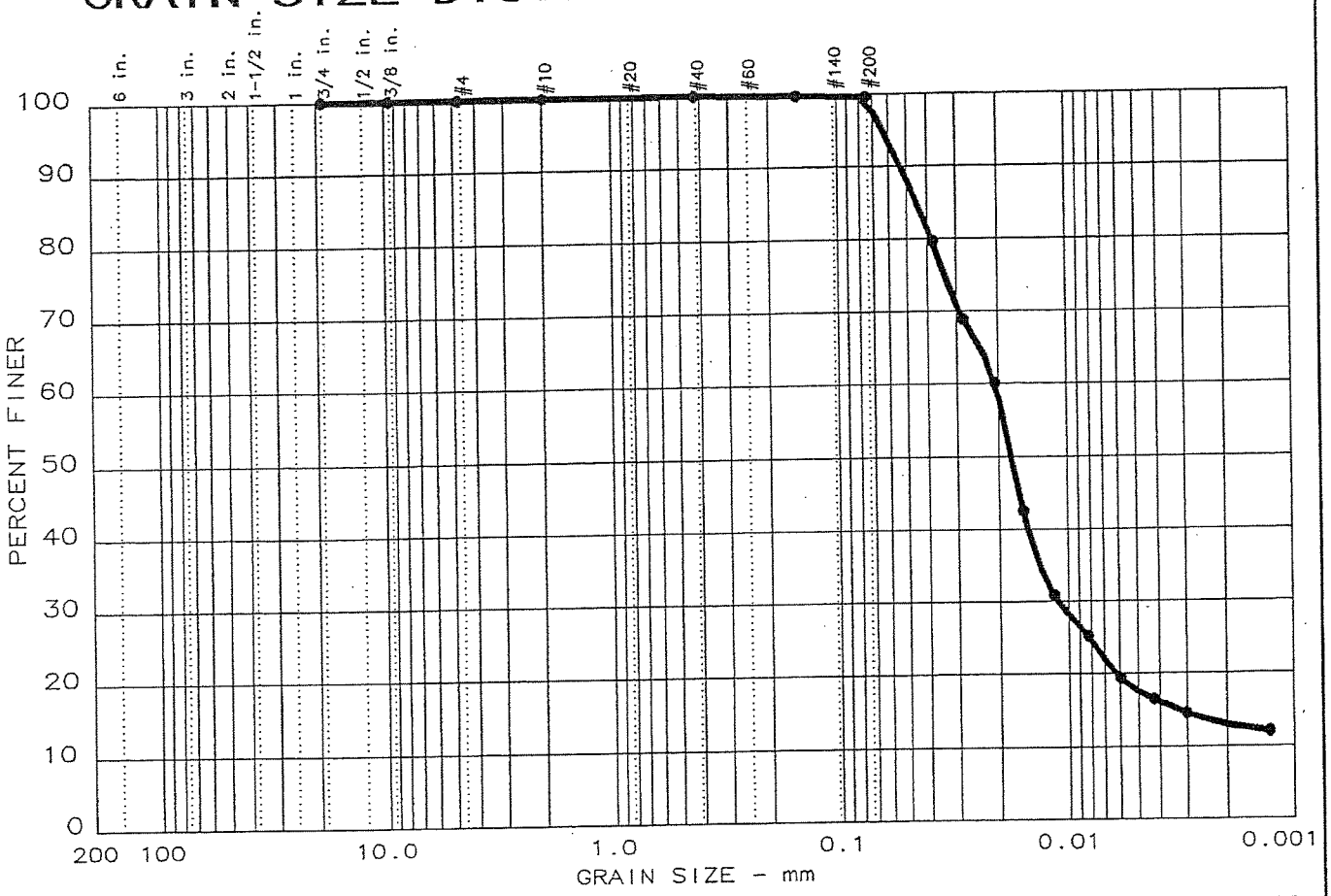
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.0	46.5	40.2	0.0131	47.5	8.5	0.0383	60.6
2.0	21.0	43.0	36.7	0.0131	44.0	9.1	0.0280	55.3
4.0	21.0	36.0	29.7	0.0131	37.0	10.2	0.0210	44.8
8.0	21.5	31.5	25.3	0.0130	32.5	11.0	0.0153	38.2
16.0	21.5	26.5	20.3	0.0130	27.5	11.8	0.0112	30.6
32.0	22.0	23.0	16.9	0.0130	24.0	12.4	0.0081	25.5
64.0	22.0	20.0	13.9	0.0130	21.0	12.9	0.0058	21.0
128.0	22.0	19.0	12.9	0.0130	20.0	13.0	0.0041	19.5
256.0	22.0	17.5	11.4	0.0130	18.5	13.3	0.0030	17.2
1440.0	21.0	16.0	9.7	0.0131	17.0	13.5	0.0013	14.6

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.8 % SAND = 22.3
% SILT = 56.8 % CLAY = 20.1

D85= 0.26 D60= 0.036 D50= 0.024
D30= 0.0108 D15= 0.00165

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.0	0.4	82.1	17.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	36.6	14.2			0.0176	0.0111	0.0033			

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowbrown clayey SILT, trace sand	CL	

Project No.: 946-02-000
Project: Vernon Co. Clay test pit
● Location: TP-9/S-1

Date: 3/8/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 18

Date: 3/8/05
Project No.: 946-02-000
Project: Vernon Co. Clay test pit

Sample Data

Location of Sample: TP-9/S-1
Sample Description: Dark yellowbrown clayey SILT, trace sand
USCS Class: CL Liquid limit: 36.6
AASHTO Class: Plasticity index: 14.2

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	674.30	157.00
Tare =	154.60	154.60
Dry sample weight =	519.70	2.40

Minus #200 from wash= 99.5 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.00	0.00	100.0
# 40	0.00	0.00	100.0
# 100	1.20	0.00	99.8
# 200	1.10	0.00	99.6

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 99.6
Weight of hydrometer sample: 50
Calculated biased weight= 50.22
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

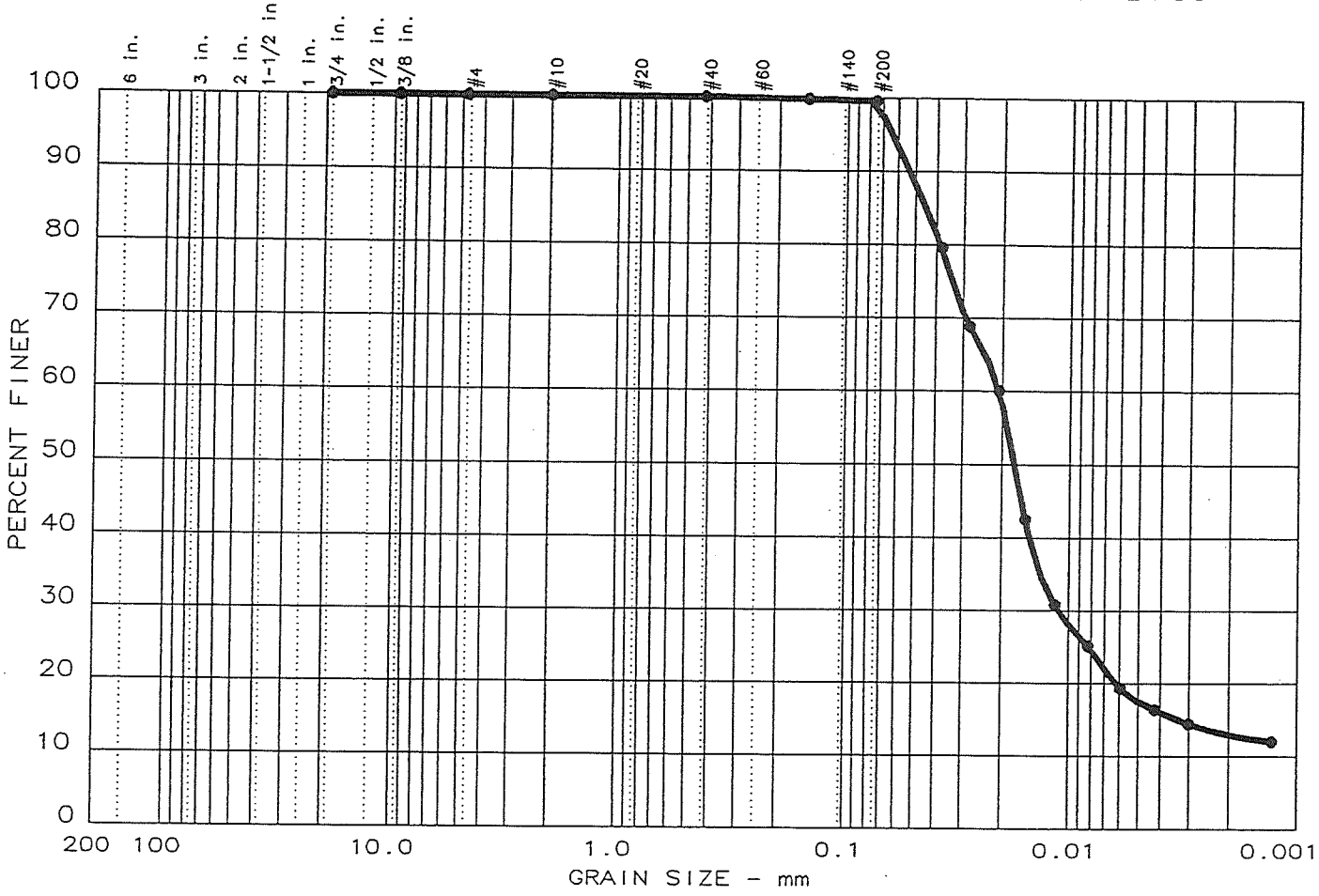
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.5	47.0	40.8	0.0130	48.0	8.4	0.0379	79.6
2.0	21.5	41.5	35.3	0.0130	42.5	9.3	0.0282	68.9
4.0	21.5	37.0	30.8	0.0130	38.0	10.1	0.0207	60.1
8.0	21.5	28.0	21.8	0.0130	29.0	11.5	0.0157	42.5
16.0	21.5	22.0	15.8	0.0130	23.0	12.5	0.0115	30.8
32.0	22.0	19.0	12.9	0.0130	20.0	13.0	0.0083	25.2
64.0	22.0	16.0	9.9	0.0130	17.0	13.5	0.0060	19.3
128.0	22.0	14.5	8.4	0.0130	15.5	13.8	0.0042	16.4
256.0	22.0	13.5	7.4	0.0130	14.5	13.9	0.0030	14.5
1440.0	21.0	12.5	6.2	0.0131	13.5	14.1	0.0013	12.1

Fractional Components

:avel/Sand based on #4 sieve
ınd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 0.4
SILT = 82.1 % CLAY = 17.5

)5= 0.04 D60= 0.021 D50= 0.018
)0= 0.0111 D15= 0.0033

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	15	0.0	0.0	0.5	82.0	17.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	36.6	14.2			0.0176	0.0111	0.0033			

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark Yellowbrown clayey SILT, trace sand	CL	

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
● Location: TP-9/S-2

Date: 3-8-05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay Cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 15

te: 3-8-05
oject No.: 946 02 000
oject: Vernon Co. Clay Test Pit

Sample Data

cation of Sample: TP-9/S-2
mple Description: Dark Yellowbrown clayey SILT, trace sand
CS Class: CL Liquid limit: 36.6
SHTO Class: Plasticity index: 14.2

Notes

marks: Clay Cover

g. No.: 1

Mechanical Analysis Data

	Initial	After wash
y sample and tare=	675.10	157.00
re =	154.50	154.50
y sample weight =	520.60	2.50

nus #200 from wash= 99.5 %
eve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.00	0.00	100.0
# 40	0.00	0.00	100.0
# 100	1.10	0.00	99.8
# 200	1.40	0.00	99.5

Hydrometer Analysis Data

paration sieve is number 200
rcent -#200 based on complete sample= 99.5
ight of hydrometer sample: 50
lculated biased weight= 50.24
tomatic temperature correction
Composite correction at 20 deg C =-6.5

niscus correction only= 1
ecific gravity of solids= 2.74
ecific gravity correction factor= 0.980
drometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

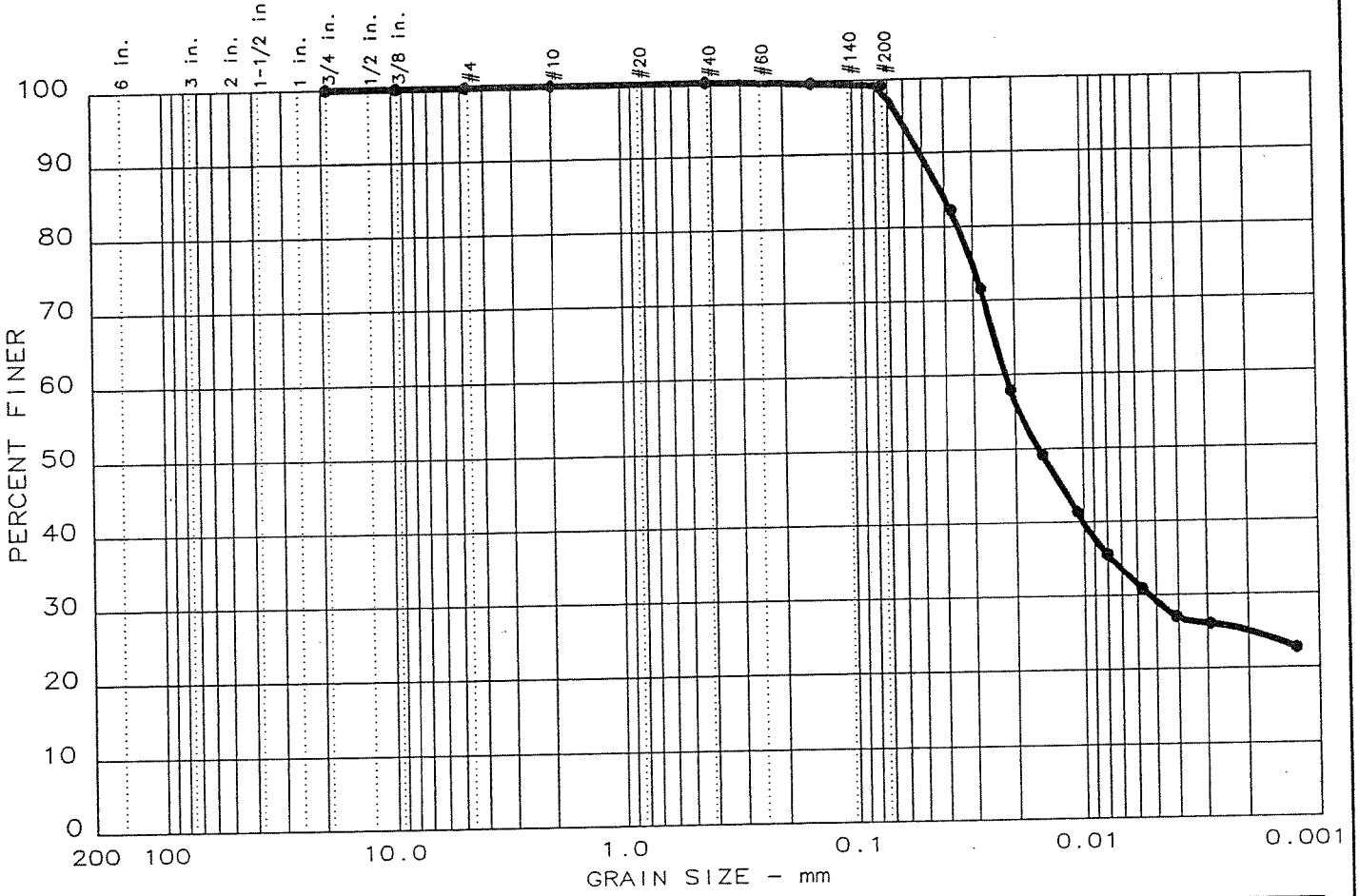
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.5	47.0	40.8	0.0130	48.0	8.4	0.0379	79.6
2.0	21.5	41.5	35.3	0.0130	42.5	9.3	0.0282	68.9
4.0	21.5	37.0	30.8	0.0130	38.0	10.1	0.0207	60.1
8.0	21.5	28.0	21.8	0.0130	29.0	11.5	0.0157	42.5
16.0	21.5	22.0	15.8	0.0130	23.0	12.5	0.0115	30.8
32.0	22.0	19.0	12.9	0.0130	20.0	13.0	0.0083	25.2
64.0	22.0	16.0	9.9	0.0130	17.0	13.5	0.0060	19.3
128.0	22.0	14.5	8.4	0.0130	15.5	13.8	0.0042	16.4
256.0	22.0	13.5	7.4	0.0130	14.5	13.9	0.0030	14.5
1440.0	21.0	12.5	6.2	0.0131	13.5	14.1	0.0013	12.1

Fractional Components

ravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 0.5
SILT = 82.0 % CLAY = 17.5

D85= 0.04 D60= 0.021 D50= 0.018
D30= 0.0111 D15= 0.00335

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	16	0.0	0.0	0.9	70.0	29.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	34.2	14.2			0.0158	0.0053				

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellowbrown clayey SILT, trace sand	CL	

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
● Location: TP-10/S-1

Date: 3-15-05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 16

ate: 3-15-05
Project No.: 946 02 000
roject: Vernon Co. Clay Test Pit

Sample Data

Location of Sample: TP-10/S-1
ample Description: Yellowbrown clayey SILT, trace sand
SCS Class: CL Liquid limit: 34.2
AASHTO Class: Plasticity index: 14.2

Notes

Remarks: Clay cover

ig. No.: 1

Mechanical Analysis Data

	Initial	After wash
ry sample and tare=	663.80	161.10
are =	155.50	155.50
ry sample weight =	508.30	5.60

Minus #200 from wash= 98.9 %
ieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.00	0.00	100.0
# 40	0.00	0.00	100.0
# 100	2.20	0.00	99.6
# 200	2.30	0.00	99.1

Hydrometer Analysis Data

eparation sieve is number 200
ercent -#200 based on complete sample= 99.1
Weight of hydrometer sample: 50
Calculated biased weight= 50.45
utomatic temperature correction
Composite correction at 20 deg C =-6.5

eniscus correction only= 1
pecific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

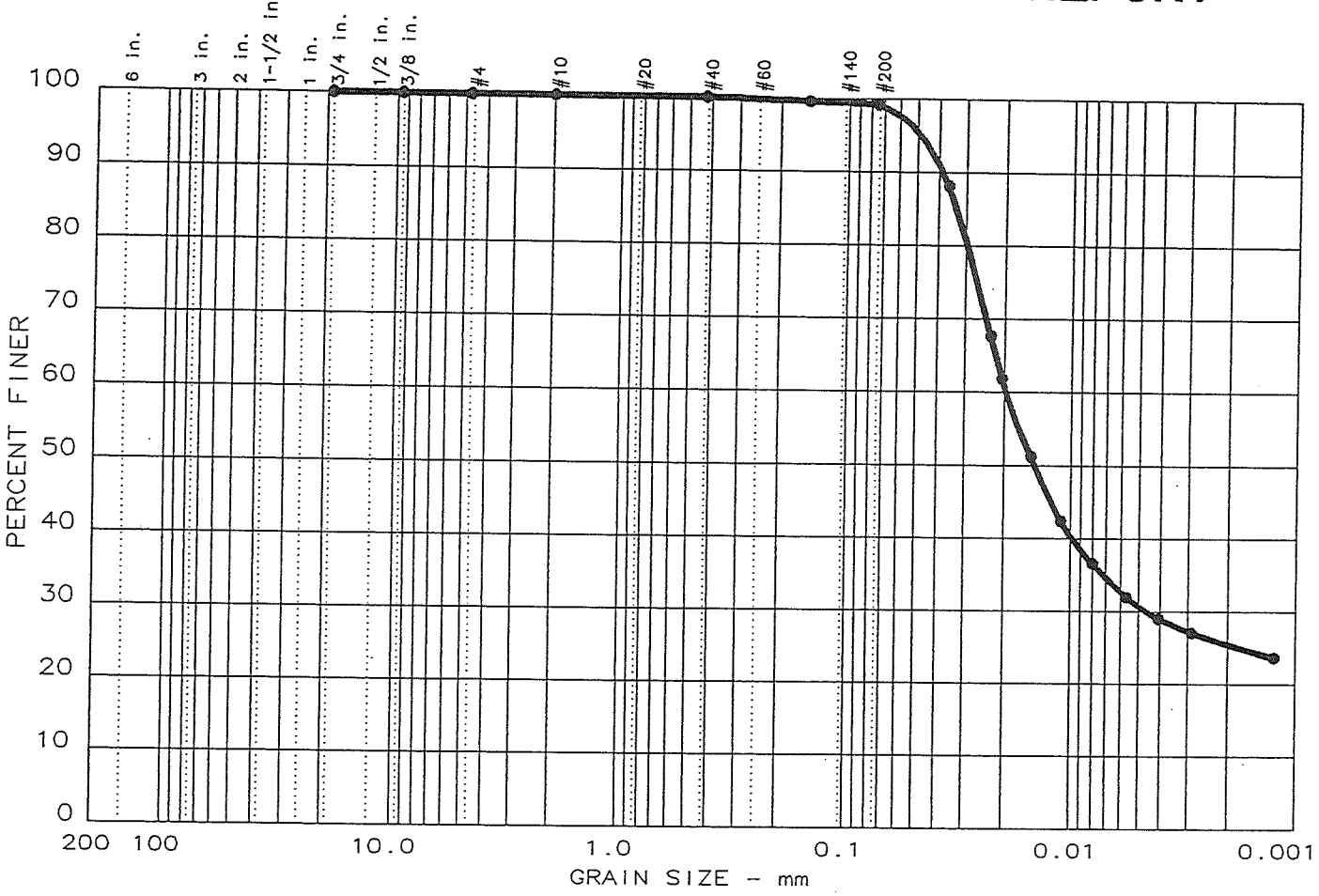
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.5	48.5	42.3	0.0130	49.5	8.2	0.0373	82.2
2.0	21.5	43.0	36.8	0.0130	44.0	9.1	0.0278	71.5
4.0	21.5	36.0	29.8	0.0130	37.0	10.2	0.0209	57.9
8.0	21.5	31.5	25.3	0.0130	32.5	11.0	0.0153	49.2
17.0	21.5	27.5	21.3	0.0130	28.5	11.6	0.0108	41.4
32.0	21.5	24.5	18.3	0.0130	25.5	12.1	0.0080	35.5
64.0	22.0	22.0	15.9	0.0130	23.0	12.5	0.0057	30.9
128.0	22.0	20.0	13.9	0.0130	21.0	12.9	0.0041	27.0
256.0	22.0	19.5	13.4	0.0130	20.5	12.9	0.0029	26.1
1440.0	21.0	18.0	11.7	0.0131	19.0	13.2	0.0013	22.7

Fractional Components

avel/Sand based on #4 sieve
nd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 0.9
SILT = 70.0 % CLAY = 29.1

5= 0.04 D60= 0.022 D50= 0.016
0= 0.0053

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	17	0.0	0.0	0.8	68.6	30.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	33.4	12.4			0.0146	0.0046				

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellowbrown clayey SILT, trace sand	CL	

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
● Location: TP-10/S-2

Date: 3-15-05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 17

te: 3-15-05
oject No.: 946 02 000
oject: Vernon Co. Clay Test Pit

Sample Data

cation of Sample: TP-10/S-2
mple Description: Yellowbrown clayey SILT, trace sand
CS Class: CL Liquid limit: 33.4
SHTO Class: Plasticity index: 12.4

Notes

marks: Clay cover

g. No.: 1

Mechanical Analysis Data

	Initial	After wash
y sample and tare=	675.50	159.20
re =	154.80	155.00
y sample weight =	520.70	4.20
nus #200 from wash=	99.2 %	

eve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.00	0.00	100.0
# 40	0.00	0.00	100.0
# 100	2.40	0.00	99.5
# 200	1.60	0.00	99.2

Hydrometer Analysis Data

paration sieve is number 200
rcent -#200 based on complete sample= 99.2
ight of hydrometer sample: 50
lculated biased weight= 50.39
tomatic temperature correction
Composite correction at 20 deg C =-6.5

niscus correction only= 1
ecific gravity of solids= 2.74
ecific gravity correction factor= 0.980
drometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

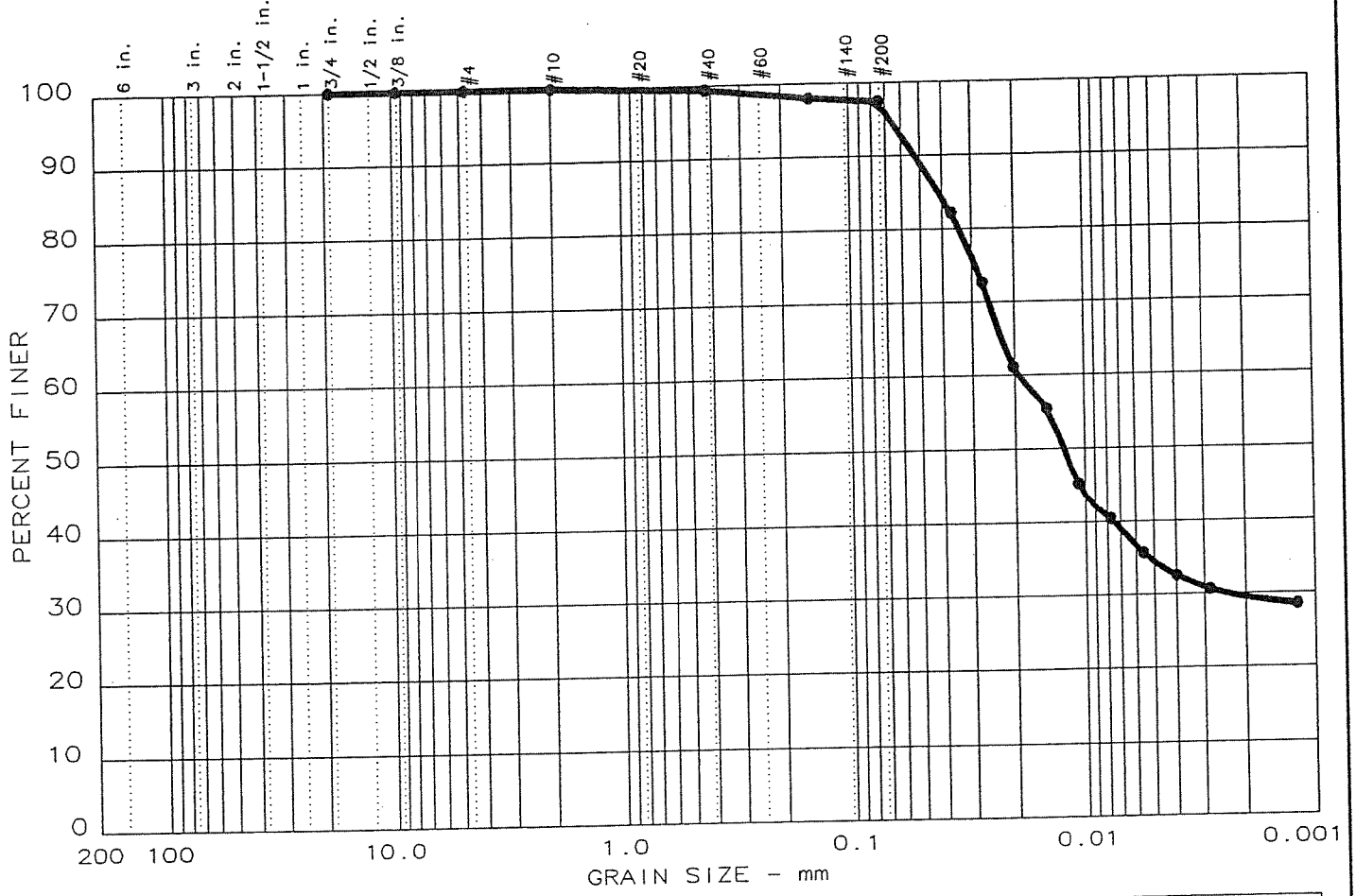
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	21.5	51.5	45.3	0.0130	52.5	7.7	0.0362	88.1
3.0	21.5	41.0	34.8	0.0130	42.0	9.4	0.0231	67.7
4.0	21.5	38.0	31.8	0.0130	39.0	9.9	0.0205	61.9
8.0	21.5	32.5	26.3	0.0130	33.5	10.8	0.0152	51.2
16.0	21.5	28.0	21.8	0.0130	29.0	11.5	0.0111	42.4
32.0	21.5	25.0	18.8	0.0130	26.0	12.0	0.0080	36.6
65.0	22.0	22.5	16.4	0.0130	23.5	12.4	0.0057	31.9
128.0	22.0	21.0	14.9	0.0130	22.0	12.7	0.0041	29.0
256.0	22.0	20.0	13.9	0.0130	21.0	12.9	0.0029	27.1
1440.0	21.0	18.5	12.2	0.0131	19.5	13.1	0.0013	23.7

Fractional Components

ravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 0.8
SILT = 68.6 % CLAY = 30.6

D85= 0.03 D60= 0.020 D50= 0.015
30= 0.0046

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	7	0.0	0.0	2.6	63.0	34.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	37.7	19.7			0.0124	0.0024				

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowbrown clayey SILT, trace sand	CL	

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
● Location: TP-11/S-1

Date: 3/21/05

Remarks:

Clay cover

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 7

ate: 3/21/05
Project No.: 946 02 000
roject: Vernon Co. Clay Test Pit

Sample Data

Location of Sample: TP-11/S-1
ample Description: Dark yellowbrown clayey SILT, trace sand
SCS Class: CL Liquid limit: 37.7
AASHTO Class: Plasticity index: 19.7

Notes

emarks: Clay cover

ig. No.: 1

Mechanical Analysis Data

	Initial	After wash
ry sample and tare=	724.70	172.30
are =	157.10	157.10
Dry sample weight =	567.60	15.20
Minus #200 from wash=	97.3 %	

ieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.20	0.00	100.0
# 40	3.40	0.00	99.4
# 100	7.90	0.00	98.0
# 200	3.30	0.00	97.4

Hydrometer Analysis Data

eparation sieve is number 200
ercent -#200 based on complete sample= 97.4
Weight of hydrometer sample: 50
Calculated biased weight= 51.34
utomatic temperature correction
Composite correction at 20 deg C =-6.5

eniscus correction only= 1
pecific gravity of solids= 2.74
Specific gravity correction factor= 0.980
ydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

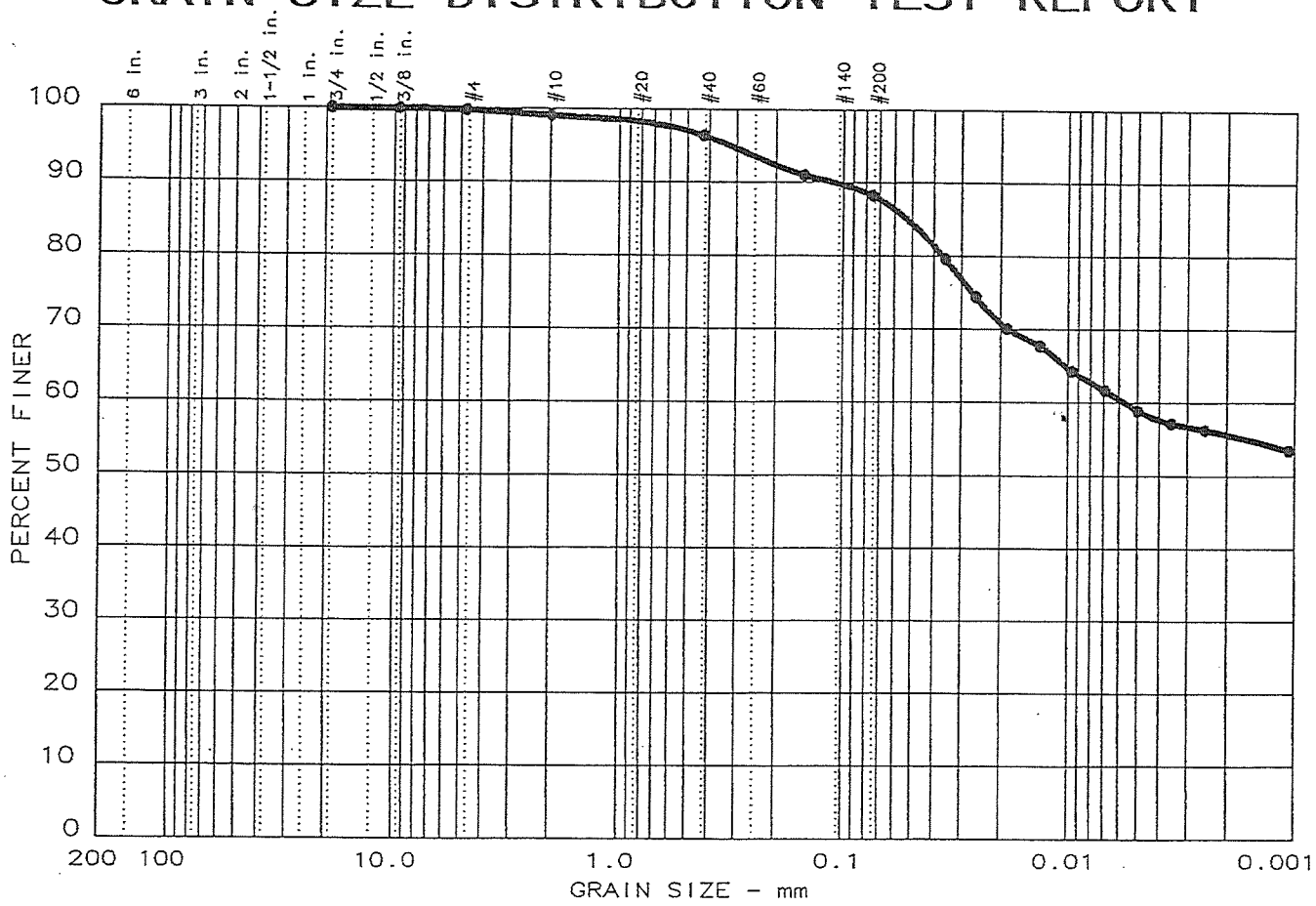
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	22.5	49.0	43.0	0.0129	50.0	8.1	0.0367	82.2
2.0	22.5	44.0	38.0	0.0129	45.0	8.9	0.0272	72.6
4.0	22.5	38.0	32.0	0.0129	39.0	9.9	0.0203	61.2
8.0	22.5	35.0	29.0	0.0129	36.0	10.4	0.0147	55.4
16.0	23.0	29.5	23.7	0.0128	30.5	11.3	0.0108	45.2
32.0	23.0	27.0	21.2	0.0128	28.0	11.7	0.0077	40.4
64.0	23.0	24.5	18.7	0.0128	25.5	12.1	0.0056	35.6
128.0	22.5	23.0	17.0	0.0129	24.0	12.4	0.0040	32.5
256.0	22.5	22.0	16.0	0.0129	23.0	12.5	0.0029	30.6
1477.0	22.0	21.0	14.9	0.0130	22.0	12.7	0.0012	28.5

Fractional Components

avel/Sand based on #4 sieve
nd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 2.6
SILT = 63.0 % CLAY = 34.4

5= 0.04 D60= 0.019 D50= 0.012
0= 0.0024

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	8	0.0	0.2	11.6	29.3	58.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	60.2	31.7								

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowbrown silty CLAY, little sand, trace gravel	CH	

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
● Location: TP-11/S-2

Date: 3/21/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 8

ate: 3/21/05
roject No.: 946 02 000
roject: Vernon Co. Clay Test Pit

Sample Data

ocation of Sample: TP-11/S-2
ample Description: Dark yellowbrown silty CLAY, little sand, trace gravel
SCS Class: CH Liquid limit: 60.2
ASHTO Class: Plasticity index: 31.7

Notes

emarks: Clay cover

ig. No.: 1

Mechanical Analysis Data

	Initial	After wash
ry sample and tare=	530.70	200.00
are =	155.20	155.60
ry sample weight =	375.50	44.40
inus #200 from wash=	88.2 %	

ieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.90	0.00	99.8
# 10	2.60	0.00	99.1
# 40	10.20	0.00	96.4
# 100	20.20	0.00	91.0
# 200	10.40	0.00	88.2

Hydrometer Analysis Data

eparation sieve is number 200
ercent -#200 based on complete sample= 88.2
eight of hydrometer sample: 50
alculated biased weight= 56.69
utomatic temperature correction
Composite correction at 20 deg C =-6.5

eniscus correction only= 1
pecific gravity of solids= 2.74
pecific gravity correction factor= 0.980
ydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

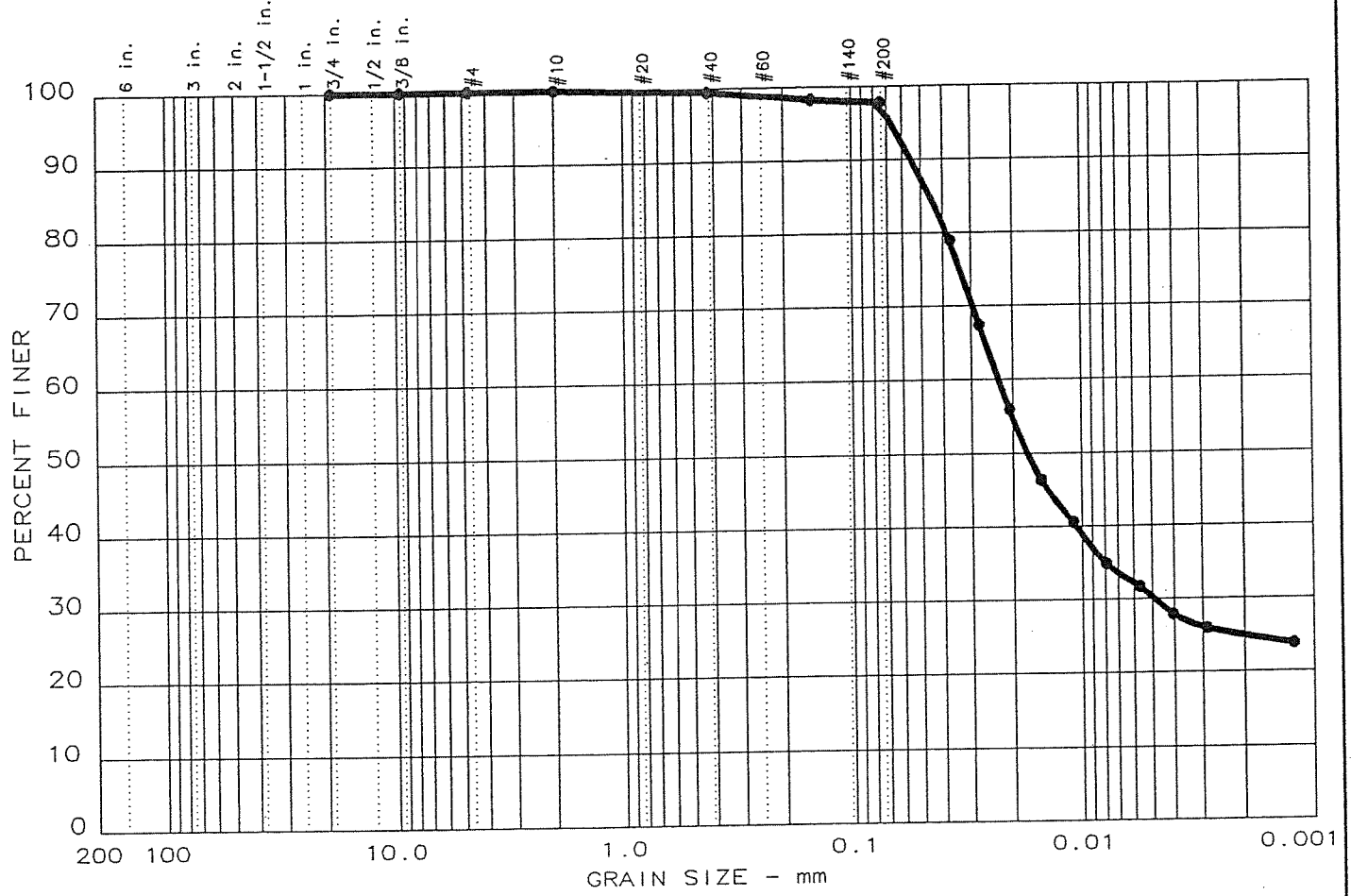
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	22.5	52.0	46.0	0.0129	53.0	7.6	0.0355	79.6
2.0	22.5	49.0	43.0	0.0129	50.0	8.1	0.0259	74.4
4.0	22.5	46.5	40.5	0.0129	47.5	8.5	0.0188	70.1
8.0	23.0	45.0	39.2	0.0128	46.0	8.8	0.0134	67.7
16.0	23.0	43.0	37.2	0.0128	44.0	9.1	0.0096	64.3
32.0	23.0	41.5	35.7	0.0128	42.5	9.3	0.0069	61.7
64.0	22.5	40.0	34.0	0.0129	41.0	9.6	0.0050	58.9
128.0	22.5	39.0	33.0	0.0129	40.0	9.7	0.0036	57.1
256.0	22.5	38.5	32.5	0.0129	39.5	9.8	0.0025	56.3
1470.0	22.0	37.0	30.9	0.0130	38.0	10.1	0.0011	53.5

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.2 % SAND = 11.6
SILT = 29.3 % CLAY = 58.9

D85= 0.05 D60= 0.006

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	9	0.0	0.0	2.2	67.5	30.3

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	35.2	15.8			0.0172	0.0049				

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowishbrown clayey SILT, trace sand	CL	

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
● Location: TP-12/S-1

Date: 3/21/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 9

Date: 3/21/05
Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit

Sample Data

Location of Sample: TP-12/S-1
Sample Description: Dark yellowishbrown clayey SILT, trace sand
USCS Class: CL Liquid limit: 35.2
AASHTO Class: Plasticity index: 15.8

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	665.10	167.40
Tare =	156.10	156.00
Dry sample weight =	509.00	11.40

Minus #200 from wash= 97.8 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.10	0.00	100.0
# 40	2.80	0.00	99.4
# 100	5.90	0.00	98.3
# 200	2.50	0.00	97.8

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 97.8
Weight of hydrometer sample: 50
Calculated biased weight= 51.14
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.0	47.0	41.2	0.0128	48.0	8.4	0.0372	78.9
2.0	23.0	41.0	35.2	0.0128	42.0	9.4	0.0278	67.4
4.0	23.0	35.0	29.2	0.0128	36.0	10.4	0.0206	55.9
8.0	23.0	30.0	24.2	0.0128	31.0	11.2	0.0152	46.3
16.0	23.0	27.0	21.2	0.0128	28.0	11.7	0.0110	40.6
32.0	23.0	24.0	18.2	0.0128	25.0	12.2	0.0079	34.8
64.0	22.5	22.5	16.5	0.0129	23.5	12.4	0.0057	31.7
128.0	22.5	20.5	14.5	0.0129	21.5	12.8	0.0041	27.9
256.0	22.5	19.5	13.5	0.0129	20.5	12.9	0.0029	25.9
1463.0	22.0	18.5	12.4	0.0130	19.5	13.1	0.0012	23.8

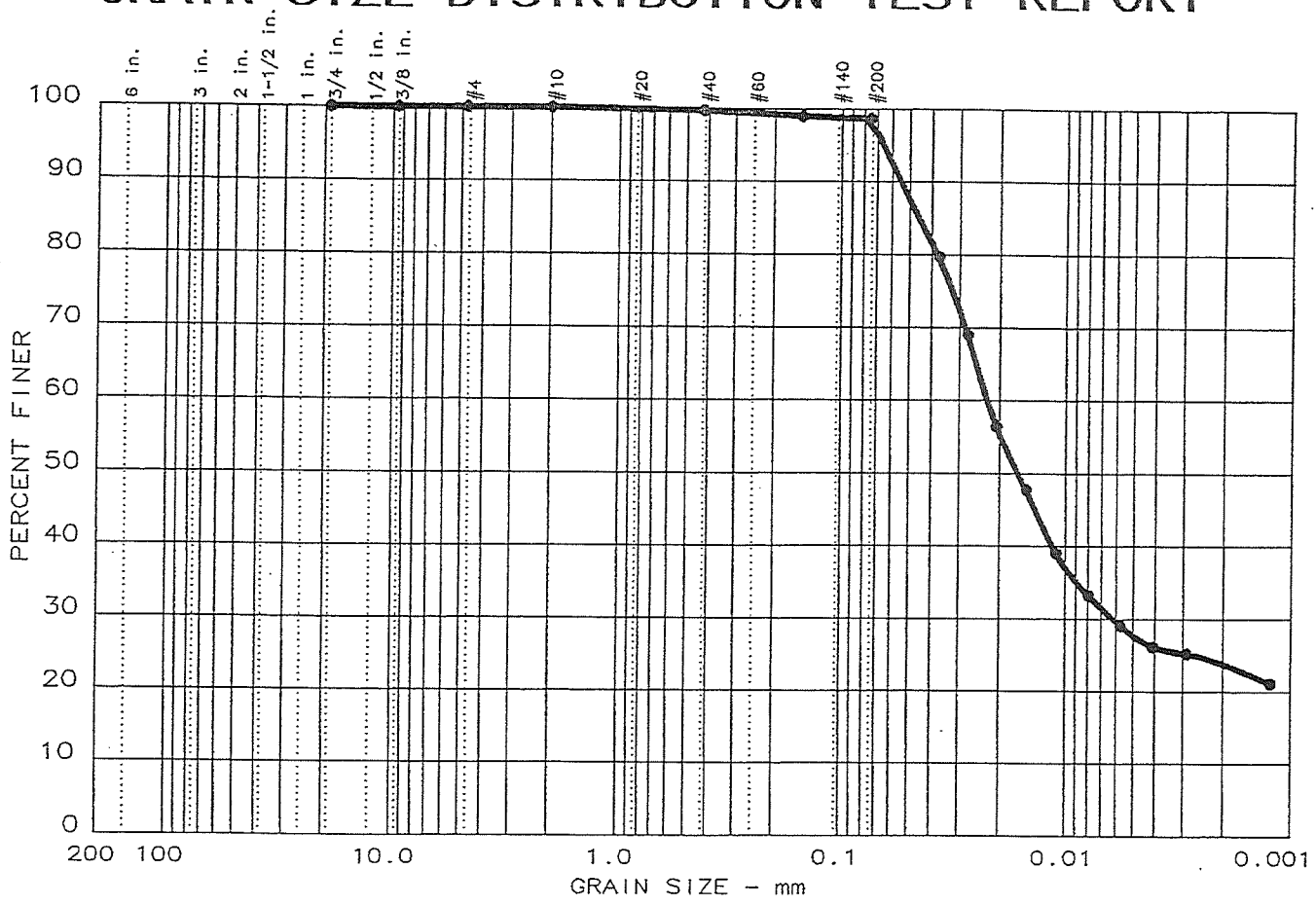
Fractional Components

---

avel/Sand based on #4 sieve
nd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 2.2
SILT = 67.5 % CLAY = 30.3

5= 0.05 D60= 0.023 D50= 0.017
0= 0.0049

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	10	0.0	0.0	1.3	71.0	27.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	36.5	17.6			0.0165	0.0062				

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowbrown clayey SILT, trace sand	CL	

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
● Location: TP-13/S-1

Date: 3/29/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 10

ate: 3/29/05
roject No.: 946 02 000
roject: Vernon Co. Clay Test Pit

Sample Data

ocation of Sample: TP-13/S-1
ample Description: Dark yellowbrown clayey SILT, trace sand
SCS Class: CL
ASHTO Class:
Liquid limit: 36.5
Plasticity index: 17.6

Notes

emarks: Clay cover

ig. No.: 1

Mechanical Analysis Data

	Initial	After wash
ry sample and tare=	693.00	162.60
are =	155.90	155.60
ry sample weight =	537.10	7.00
inus #200 from wash=	98.7 %	

ieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.00	0.00	100.0
# 40	1.60	0.00	99.7
# 100	3.70	0.00	99.0
# 200	1.70	0.00	98.7

Hydrometer Analysis Data

eparation sieve is number 200
ercent -#200 based on complete sample= 98.7
eight of hydrometer sample: 50
alculated biased weight= 50.66
utomatic temperature correction
Composite correction at 20 deg C =-6.5

eniscus correction only= 1
pecific gravity of solids= 2.74
pecific gravity correction factor= 0.980
ydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

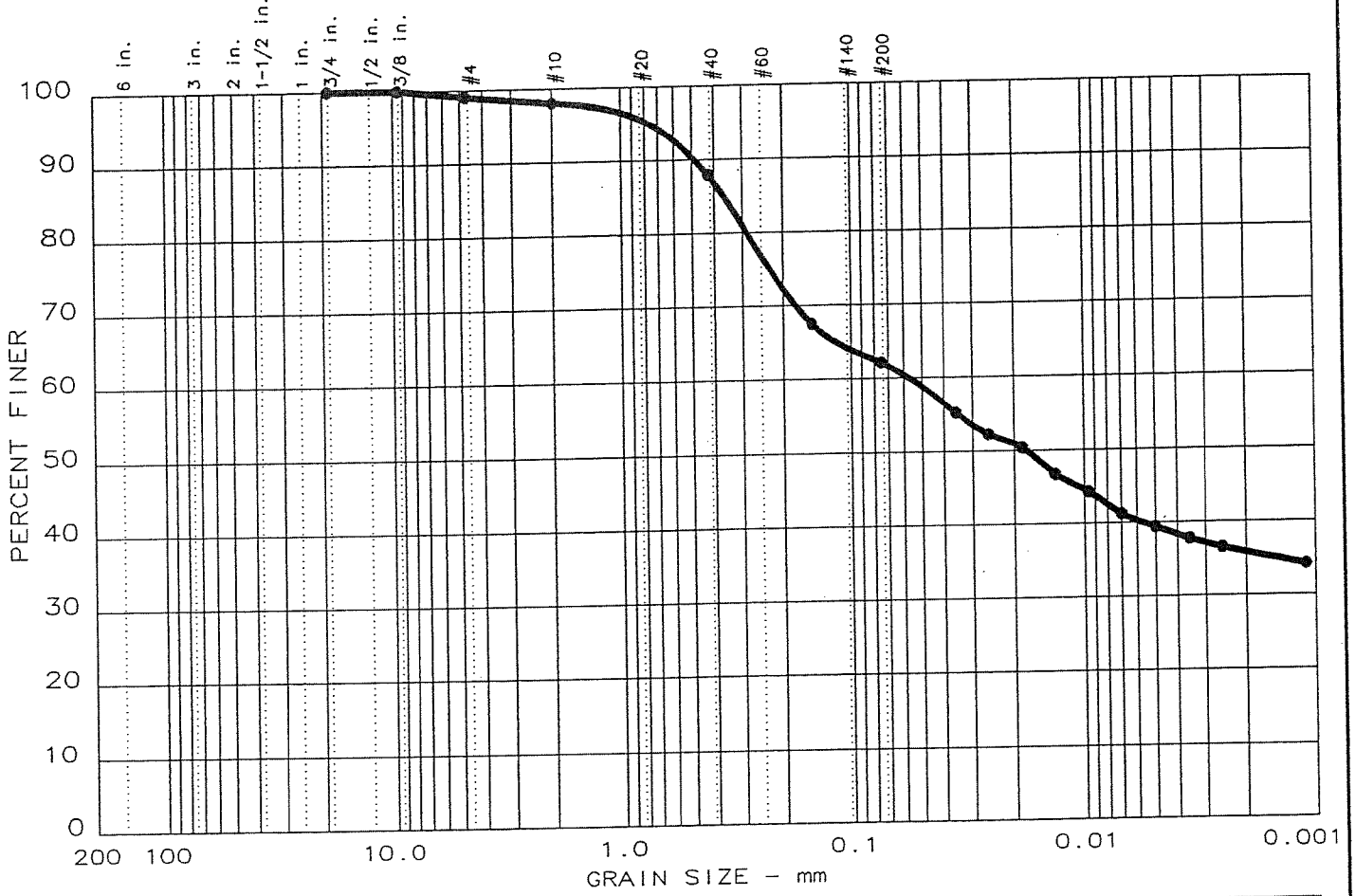
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.0	47.0	41.2	0.0128	48.0	8.4	0.0372	79.7
2.0	23.0	41.5	35.7	0.0128	42.5	9.3	0.0277	69.0
4.0	23.0	35.0	29.2	0.0128	36.0	10.4	0.0206	56.4
8.0	23.0	30.5	24.7	0.0128	31.5	11.1	0.0151	47.7
16.0	23.0	26.0	20.2	0.0128	27.0	11.9	0.0110	39.0
32.0	23.0	23.0	17.2	0.0128	24.0	12.4	0.0080	33.2
64.0	22.5	21.0	15.0	0.0129	22.0	12.7	0.0057	29.1
128.0	22.5	19.5	13.5	0.0129	20.5	12.9	0.0041	26.2
256.0	22.5	19.0	13.0	0.0129	20.0	13.0	0.0029	25.2
1456.0	22.0	17.0	10.9	0.0130	18.0	13.3	0.0012	21.1

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 1.3
% SILT = 71.0 % CLAY = 27.7

D85= 0.05 D60= 0.023 D50= 0.017
D30= 0.0062

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	11	0.0	0.9	36.9	22.8	39.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	32.4	14.1	0.363		0.0178					

MATERIAL DESCRIPTION	USCS	AASHTO
● Yellowish brown silty sandy CLAY, trace gravel	CL	

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
● Location: TP-13/S-2

Date: 3/31/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 11

Date: 3/31/05
Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit

Sample Data

Location of Sample: TP-13/S-2
Sample Description: Yellowish brown silty sandy CLAY, trace gravel
USCS Class: CL Liquid limit: 32.4
AASHTO Class: Plasticity index: 14.1

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	699.00	361.50
Tare =	155.90	155.70
Dry sample weight =	543.10	205.80

Minus #200 from wash= 62.1 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	5.10	0.00	99.1
# 10	5.60	0.00	98.0
# 40	54.90	0.00	87.9
# 100	110.70	0.00	67.5
# 200	29.20	0.00	62.2

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 62.2
Weight of hydrometer sample: 50
Calculated biased weight= 80.44
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

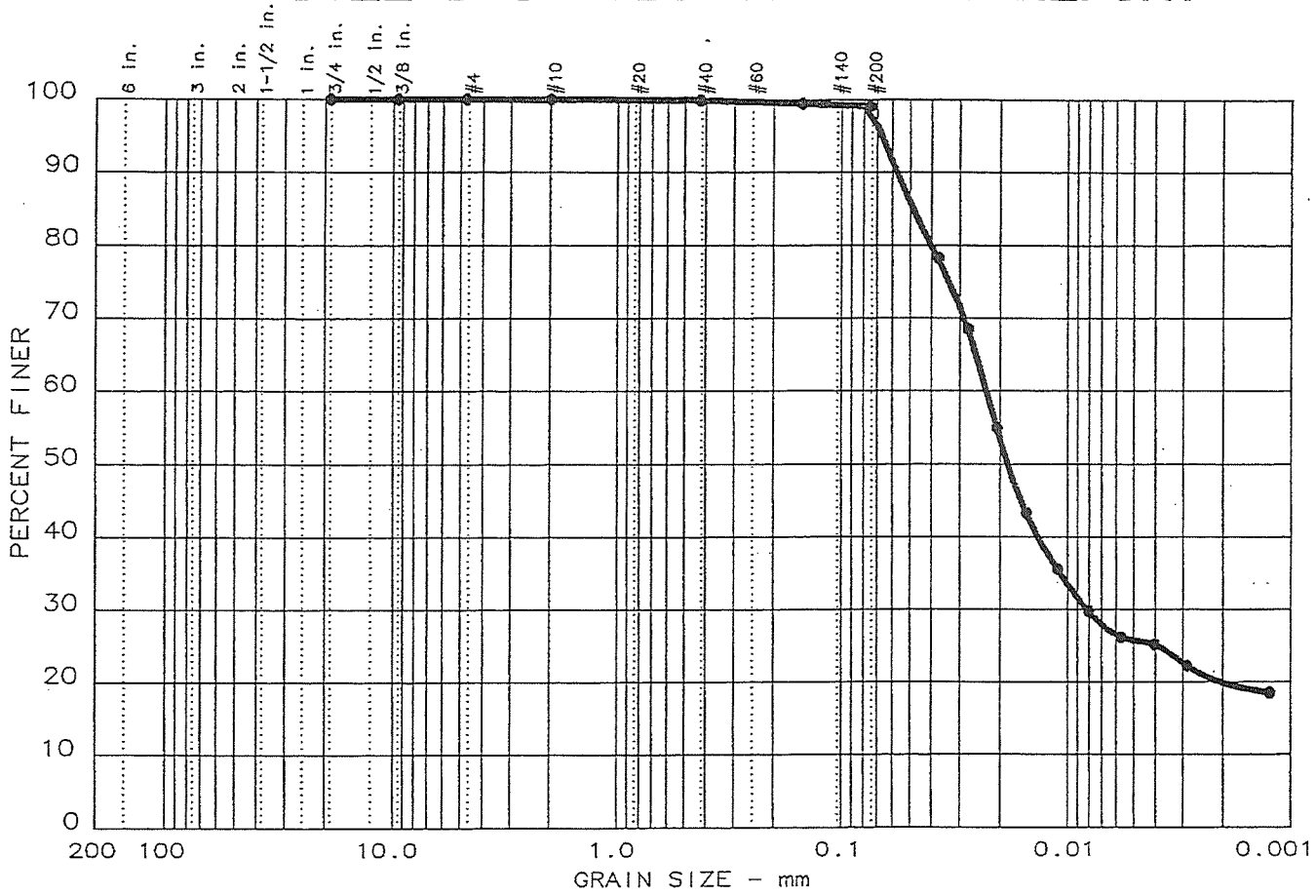
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.5	51.0	45.3	0.0127	52.0	7.8	0.0355	55.2
2.0	23.5	48.5	42.8	0.0127	49.5	8.2	0.0257	52.2
4.0	23.5	47.0	41.3	0.0127	48.0	8.4	0.0185	50.3
8.0	23.5	44.0	38.3	0.0127	45.0	8.9	0.0134	46.7
16.0	23.5	42.0	36.3	0.0127	43.0	9.2	0.0097	44.3
32.0	23.5	39.5	33.8	0.0127	40.5	9.7	0.0070	41.2
64.0	23.5	38.0	32.3	0.0127	39.0	9.9	0.0050	39.4
128.0	24.0	36.5	31.0	0.0127	37.5	10.1	0.0036	37.7
256.0	24.0	35.5	30.0	0.0127	36.5	10.3	0.0025	36.5
1440.0	22.5	34.0	28.0	0.0129	35.0	10.6	0.0011	34.2

Fractional Components

avel/Sand based on #4 sieve
nd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.9 % SAND = 36.9
SILT = 22.8 % CLAY = 39.4

5= 0.36 D60= 0.057 D50= 0.018

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	12	0.0	0.0	1.0	73.3	25.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	28.1	7.7			0.0184	0.0081				

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowbrown clayey SILT, trace sand	CL	

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
● Location: TP-14/S-1

Date: 3/31/05

Remarks:
Clay cover

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 12

Date: 3/31/05
Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit

Sample Data

Location of Sample: TP-14/S-1
Sample Description: Dark yellowbrown clayey SILT, trace sand
USCS Class: CL
AASHTO Class:
Liquid limit: 28.1
Plasticity index: 7.7

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	715.70	161.30
Tare =	155.60	155.60
Dry sample weight =	560.10	5.70
Minus #200 from wash=	99.0 %	

Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.00	0.00	100.0
# 40	0.80	0.00	99.9
# 100	2.40	0.00	99.4
# 200	2.30	0.00	99.0

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 99.0
Weight of hydrometer sample: 50
Calculated biased weight= 50.50
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

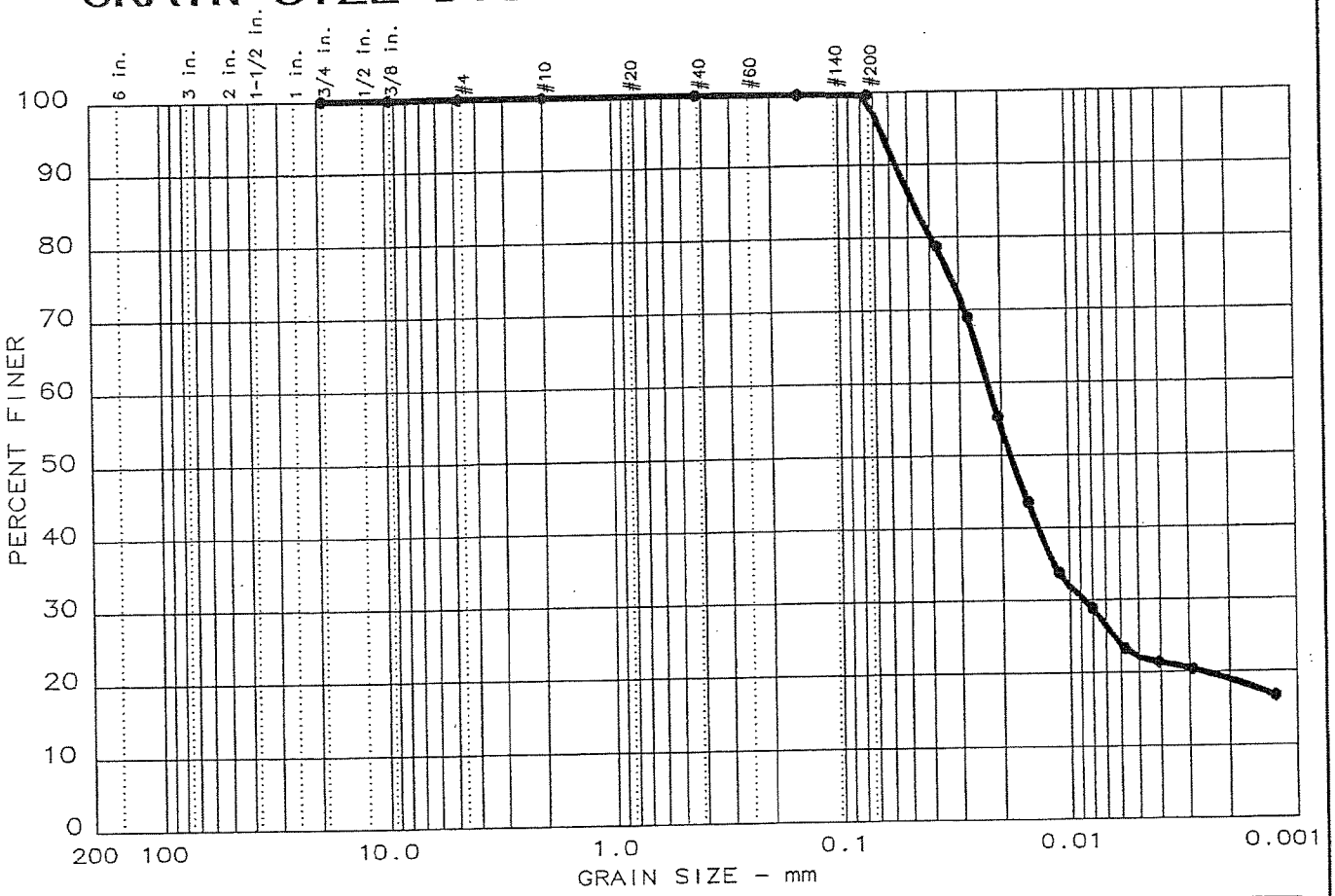
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.5	46.0	40.3	0.0127	47.0	8.6	0.0373	78.3
2.0	23.5	41.0	35.3	0.0127	42.0	9.4	0.0276	68.5
4.0	23.5	34.0	28.3	0.0127	35.0	10.6	0.0207	55.0
8.0	23.5	28.0	22.3	0.0127	29.0	11.5	0.0153	43.3
16.0	23.5	24.0	18.3	0.0127	25.0	12.2	0.0111	35.5
32.0	23.5	21.0	15.3	0.0127	22.0	12.7	0.0080	29.7
64.0	24.0	19.0	13.5	0.0127	20.0	13.0	0.0057	26.1
128.0	24.0	18.5	13.0	0.0127	19.5	13.1	0.0040	25.1
256.0	24.0	17.0	11.5	0.0127	18.0	13.3	0.0029	22.2
1440.0	22.5	15.5	9.5	0.0129	16.5	13.6	0.0013	18.5

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 1.0
SILT = 73.3 % CLAY = 25.7

D85= 0.05 D60= 0.023 D50= 0.018
D30= 0.0081

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	18	0.0	0.0	0.4	77.5	22.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	32.3	8.1			0.0182	0.0087				

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowbrown clayey SILT, trace sand	ML	

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
● Location: TP-14/S-2

Date: 3/31/05

Remarks:
Clay cover

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 18

Date: 3/31/05
Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit

Sample Data

Location of Sample: TP-14/S-2
Sample Description: Dark yellowbrown clayey SILT, trace sand
USCS Class: ML Liquid limit: 32.3
AASHTO Class: Plasticity index: 8.1

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	654.90	156.70
Tare =	154.50	154.40
Dry sample weight =	500.40	2.30

Minus #200 from wash= 99.5 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.00	0.00	100.0
# 40	0.30	0.00	99.9
# 100	0.90	0.00	99.8
# 200	0.90	0.00	99.6

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 99.6
Weight of hydrometer sample: 50
Calculated biased weight= 50.21
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

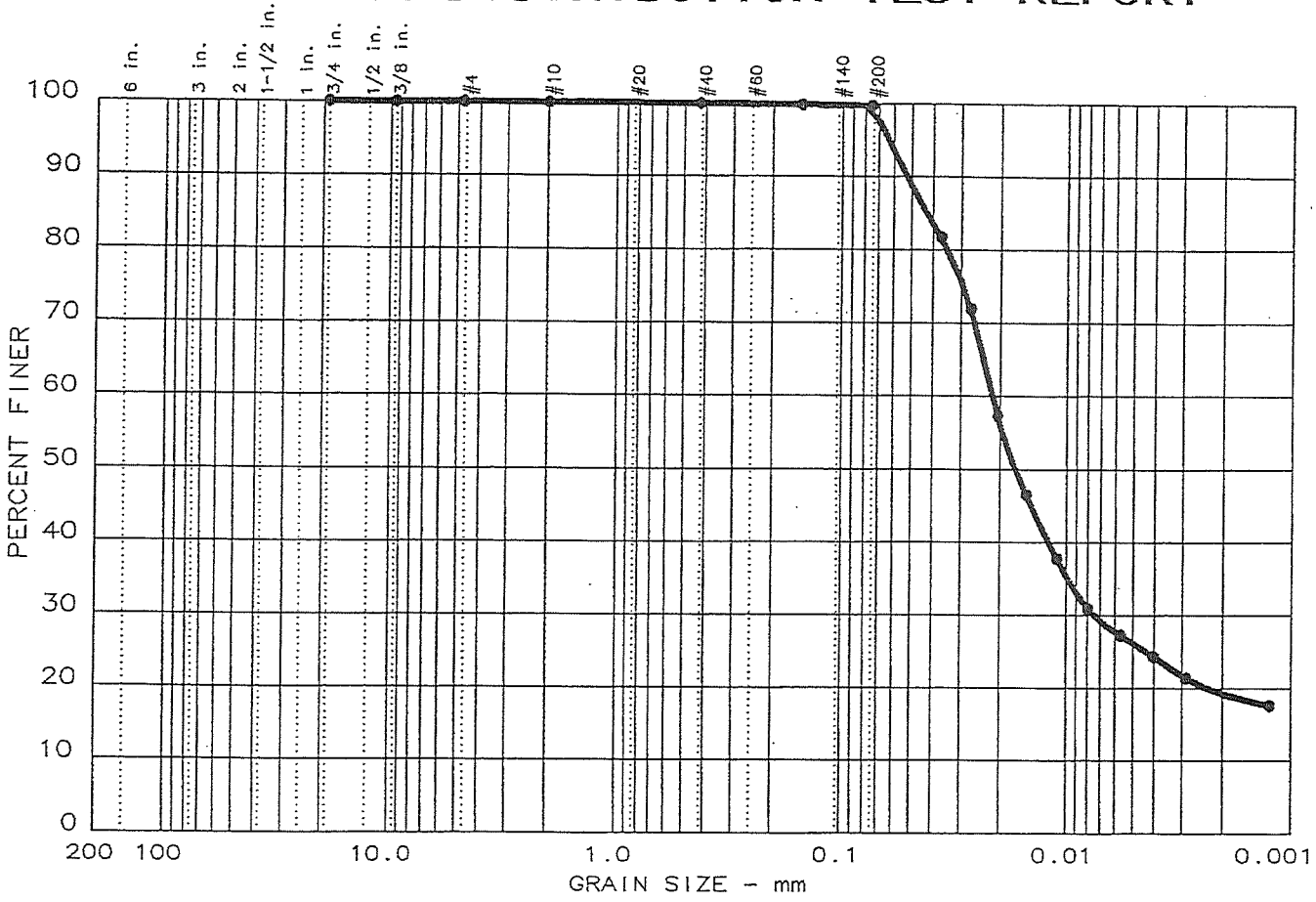
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.5	46.0	40.3	0.0127	47.0	8.6	0.0373	78.7
2.0	23.5	41.0	35.3	0.0127	42.0	9.4	0.0276	68.9
4.0	23.5	34.0	28.3	0.0127	35.0	10.6	0.0207	55.3
8.0	23.5	28.0	22.3	0.0127	29.0	11.5	0.0153	43.6
16.0	23.5	23.0	17.3	0.0127	24.0	12.4	0.0112	33.8
32.0	23.5	20.5	14.8	0.0127	21.5	12.8	0.0080	28.9
64.0	24.0	17.5	12.0	0.0127	18.5	13.3	0.0058	23.3
128.0	24.0	16.5	11.0	0.0127	17.5	13.4	0.0041	21.4
256.0	24.0	16.0	10.5	0.0127	17.0	13.5	0.0029	20.4
1440.0	22.5	14.5	8.5	0.0129	15.5	13.8	0.0013	16.7

Fractional Components

:avel/Sand based on #4 sieve
ınd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 0.4
SILT = 77.5 % CLAY = 22.1

)5= 0.05 D60= 0.023 D50= 0.018
)0= 0.0087

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	19	0.0	0.0	0.3	73.5	26.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	27.5	6.1			0.0170	0.0075				

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowbrown clayey SILT, trace sand	CL-ML	

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
● Location: TP-15/S-1

Date: 3/31/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 19

Date: 3/31/05
Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit

Sample Data

Location of Sample: TP-15/S-1
Sample Description: Dark yellowbrown clayey SILT, trace sand
USCS Class: CL-ML
AASHTO Class:
Liquid limit: 27.5
Plasticity index: 6.1

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	665.90	157.00
Tare =	155.40	155.40
Dry sample weight =	510.50	1.60

Minus #200 from wash= 99.7 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.00	0.00	100.0
# 40	0.50	0.00	99.9
# 100	0.50	0.00	99.8
# 200	0.60	0.00	99.7

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 99.7
Weight of hydrometer sample: 50
Calculated biased weight= 50.16
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

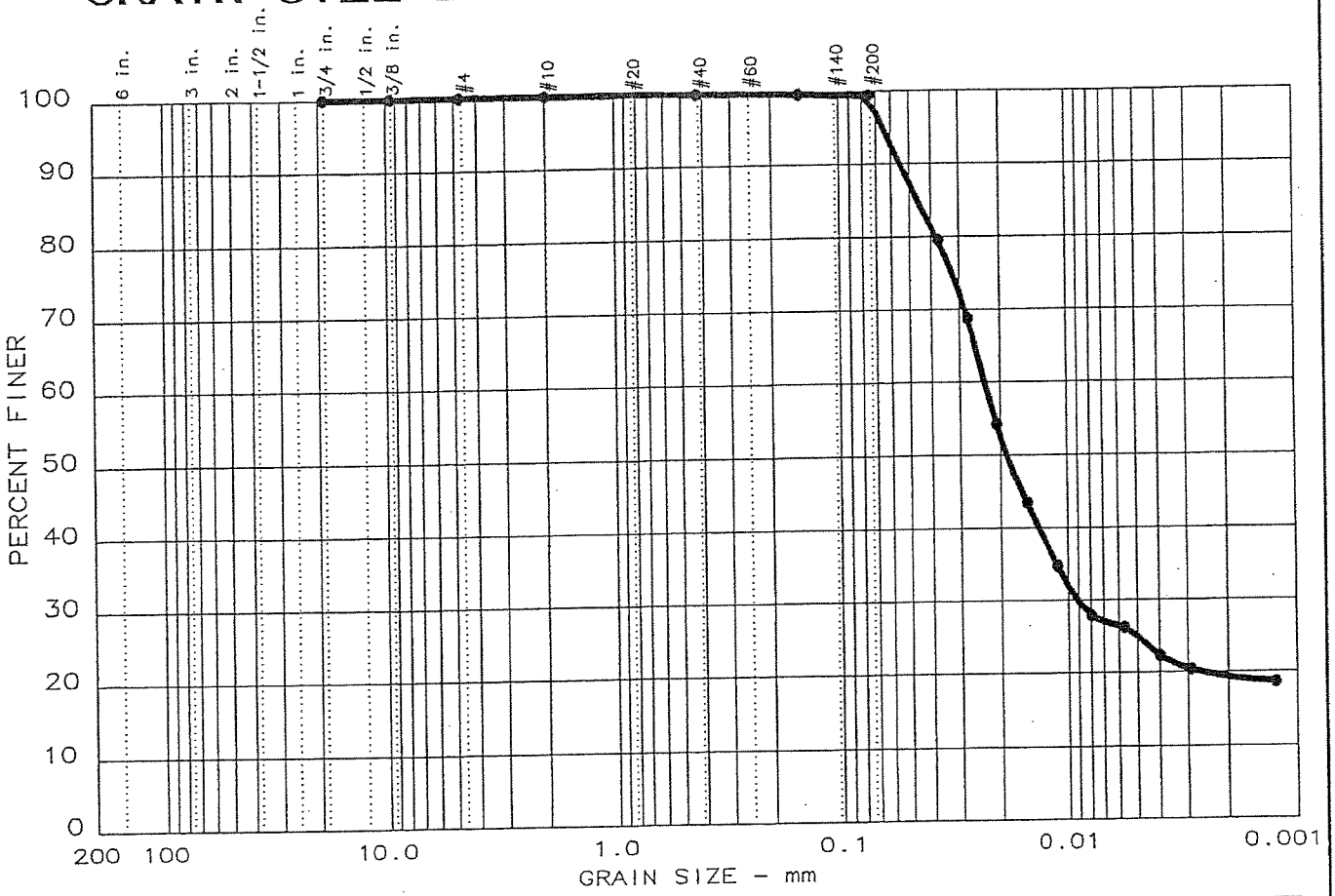
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.5	47.5	41.8	0.0127	48.5	8.3	0.0368	81.7
2.0	23.5	42.5	36.8	0.0127	43.5	9.2	0.0272	71.9
4.0	23.5	35.0	29.3	0.0127	36.0	10.4	0.0205	57.3
8.0	23.5	29.5	23.8	0.0127	30.5	11.3	0.0151	46.5
16.0	23.5	25.0	19.3	0.0127	26.0	12.0	0.0110	37.7
32.0	23.5	21.5	15.8	0.0127	22.5	12.6	0.0080	30.9
64.0	24.0	19.5	14.0	0.0127	20.5	12.9	0.0057	27.3
128.0	24.0	18.0	12.5	0.0127	19.0	13.2	0.0041	24.3
256.0	24.0	16.5	11.0	0.0127	17.5	13.4	0.0029	21.4
1440.0	22.5	15.0	9.0	0.0129	16.0	13.7	0.0013	17.7

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 0.3
% SILT = 73.5 % CLAY = 26.2

D85= 0.04 D60= 0.022 D50= 0.017
D30= 0.0075

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	20	0.0	0.0	0.6	74.4	25.0

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	32.3	10.0			0.0187	0.0091				

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowbrown clayey SILT, trace sand	CL	

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
● Location: TP-15/S-2

Date: 3/31/05

GRAIN SIZE DISTRIBUTION TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Clay cover

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 20

Date: 3/31/05
Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit

Sample Data

Location of Sample: TP-15/S-2
Sample Description: Dark yellowbrown clayey SILT, trace sand
USCS Class: CL Liquid limit: 32.3
AASHTO Class: Plasticity index: 10.0

Notes

Remarks: Clay cover

Fig. No.: 1

Mechanical Analysis Data

	Initial	After wash
Dry sample and tare=	681.90	157.70
Tare =	154.40	154.40
Dry sample weight =	527.50	3.30

Minus #200 from wash= 99.4 %
Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
0.75 inches	0.00	0.00	100.0
0.375 inches	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 10	0.00	0.00	100.0
# 40	0.40	0.00	99.9
# 100	1.40	0.00	99.7
# 200	1.40	0.00	99.4

Hydrometer Analysis Data

Separation sieve is number 200
Percent -#200 based on complete sample= 99.4
Weight of hydrometer sample: 50
Calculated biased weight= 50.31
Automatic temperature correction
Composite correction at 20 deg C =-6.5

Meniscus correction only= 1
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.5	46.5	40.8	0.0127	47.5	8.5	0.0371	79.5
2.0	23.5	41.0	35.3	0.0127	42.0	9.4	0.0276	68.8
4.0	23.5	33.5	27.8	0.0127	34.5	10.6	0.0208	54.2
8.0	23.5	28.0	22.3	0.0127	29.0	11.5	0.0153	43.5
16.0	23.5	23.5	17.8	0.0127	24.5	12.3	0.0112	34.7
33.0	23.5	20.0	14.3	0.0127	21.0	12.9	0.0079	27.9
64.0	24.0	19.0	13.5	0.0127	20.0	13.0	0.0057	26.2
134.0	24.0	17.0	11.5	0.0127	18.0	13.3	0.0040	22.3
256.0	24.0	16.0	10.5	0.0127	17.0	13.5	0.0029	20.4
1440.0	22.5	15.5	9.5	0.0129	16.5	13.6	0.0013	18.6

Fractional Components

---

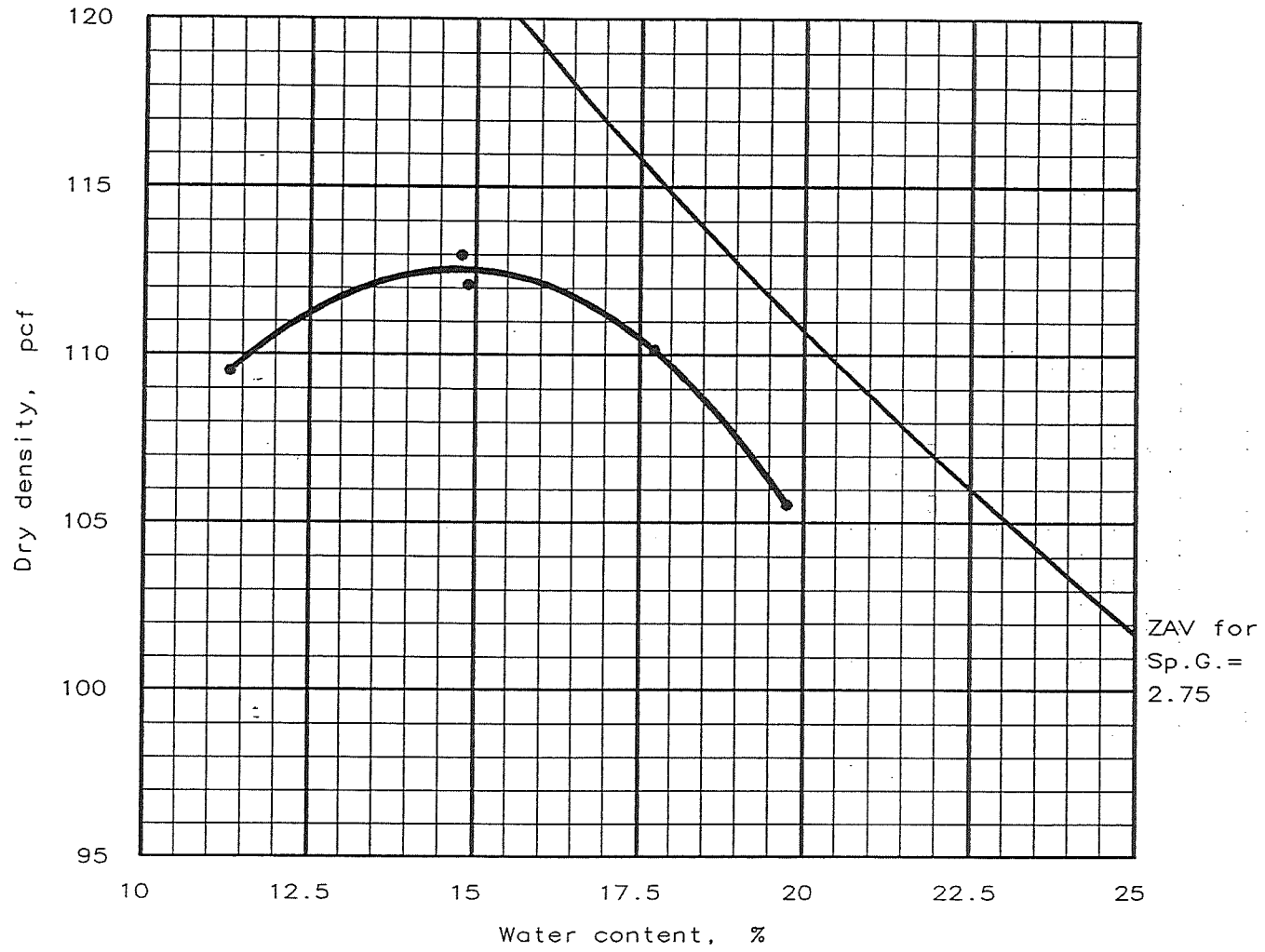
avel/Sand based on #4 sieve
nd/Fines based on #200 sieve
+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 0.6
SILT = 74.4 % CLAY = 25.0

5= 0.05 D60= 0.023 D50= 0.019
0= 0.0091

APPENDIX G

PROCTOR TEST RESULTS

MOISTURE DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure A, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
1.2'-3	CL		22.9 %		40.3	18.3	0.0 %	99.0 %

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 112.6 pcf Optimum moisture = 14.8 %	Lt. brown clayey SILT, trace sand

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
Location: TP-3

Date: 4/25/05

Remarks:

MOISTURE DENSITY RELATIONSHIP TEST

CENTRAL WISCONSIN ENGINEERS, INC.

Fig. No. 1

MOISTURE-DENSITY TEST DATA — DATA FILE: 135

PROJECT DATA

te: 4/25/05
oject No.: 946 02 000
oject: Vernon Co. Clay Test Pit
cation 1: TP-3

marks 1:

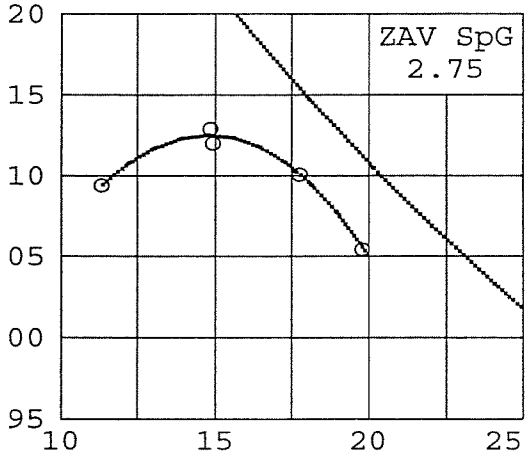
terial 1: Lt. brown clayey SILT,
scription 2: trace sand
evation or depth: 1.2'-3
g. No.: 1

SPECIMEN DATA

CS classification: CL AASHTO classification:
tural moisture: 22.9 Specific gravity:
rcent retained on No.4 sieve: 0.0
rcent passing No. 200 sieve: 99.0
quid limit: 40.3 Plastic limit: 22 Plasticity index: 18.3

TEST DATA AND RESULTS FOR CURVE 1

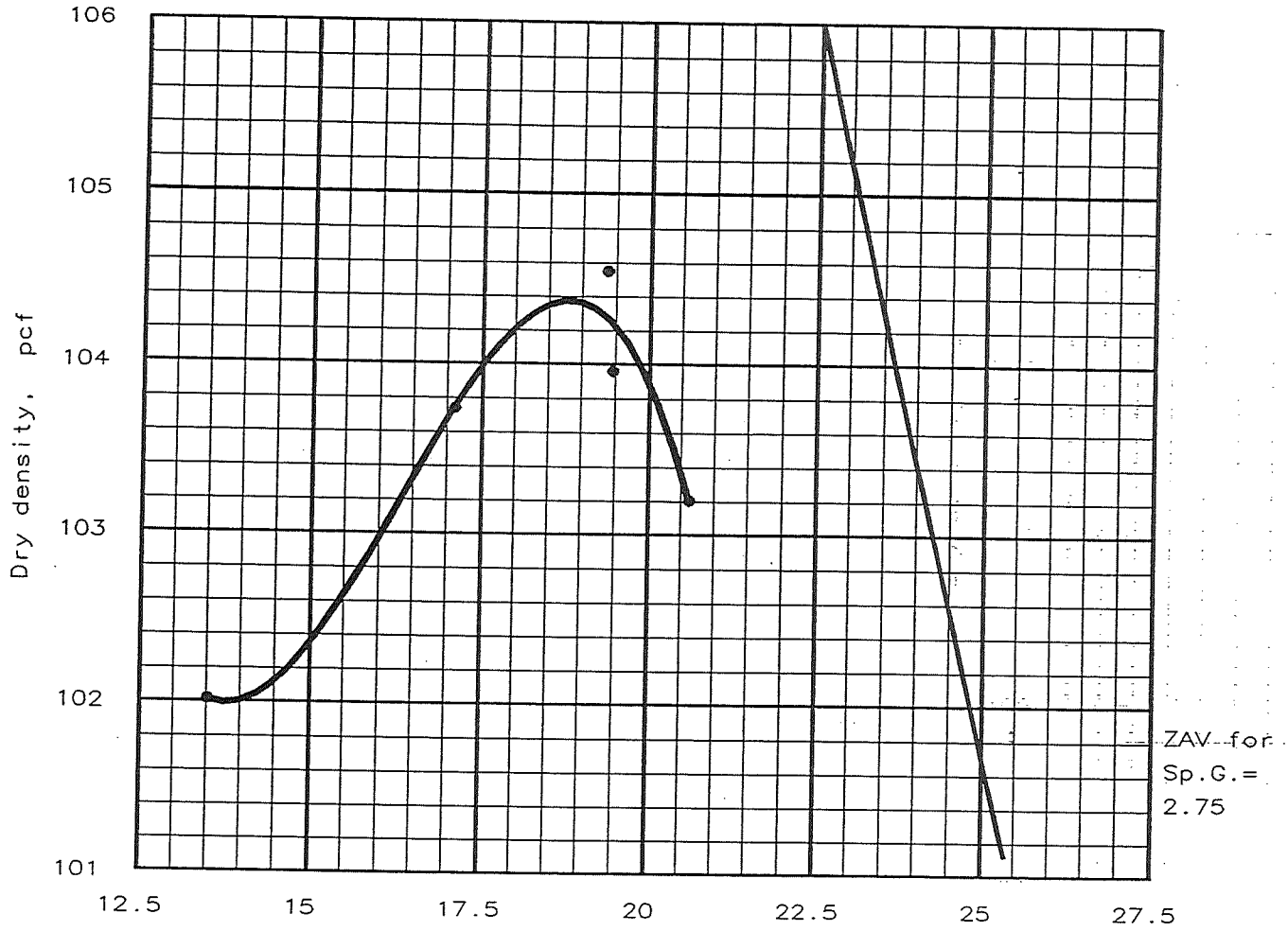
pe of test: Standard, ASTM D 698-91 Procedure A



POINT NO.	1	2	3	4	5
WM + WS	13.51	13.77	13.74	13.77	13.66
WM	9.45	9.45	9.45	9.45	9.45
WW+T #1	601.70	575.40	540.10	600.10	594.70
WD+T #1	548.10	510.90	479.80	521.10	508.80
TARE #1	74.00	75.40	75.30	75.70	74.10
MOIST #1	11.3	14.8	14.9	17.7	19.8
MOISTURE	11.3	14.8	14.9	17.7	19.8
DRY DEN	109.5	113.0	112.1	110.2	105.6

Max dry den= 112.6 pcf, Opt moisture= 14.8 %
ersize Correction Not Applied

MOISTURE DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure A, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
1'-2'	CL		22.2 %		43.9	23.9	0.9 %	95.5 %

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104.4 pcf Optimum moisture = 18.8 %	Yellowbrown clayey SILT, trace sand & gravel

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
Location: TP-7

Date: 4/20/05

Remarks:

MOISTURE DENSITY RELATIONSHIP TEST

CENTRAL WISCONSIN ENGINEERS, INC.

Fig. No. 1

MOISTURE-DENSITY TEST DATA

DATA FILE: 136

PROJECT DATA

te: 4/20/05
oject No.: 946 02 000
oject: Vernon Co. Clay Test Pit
cation 1: TP-7

marks 1:

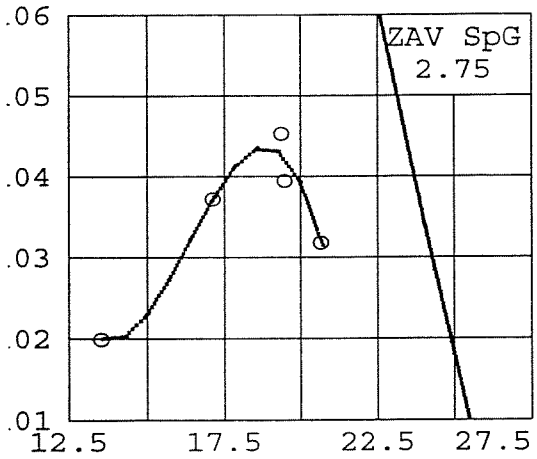
terial 1: Yellowbrown clayey SILT,
scription 2: trace sand & gravel
evation or depth: 1'-2'
g. No.: 1

SPECIMEN DATA

CS classification: CL AASHTO classification:
tural moisture: 22.2 Specific gravity:
rcent retained on No.4 sieve: 0.9
rcent passing No. 200 sieve: 95.5
quid limit: 43.9 Plastic limit: 20 Plasticity index: 23.9

TEST DATA AND RESULTS FOR CURVE 1

pe of test: Standard, ASTM D 698-91 Procedure A

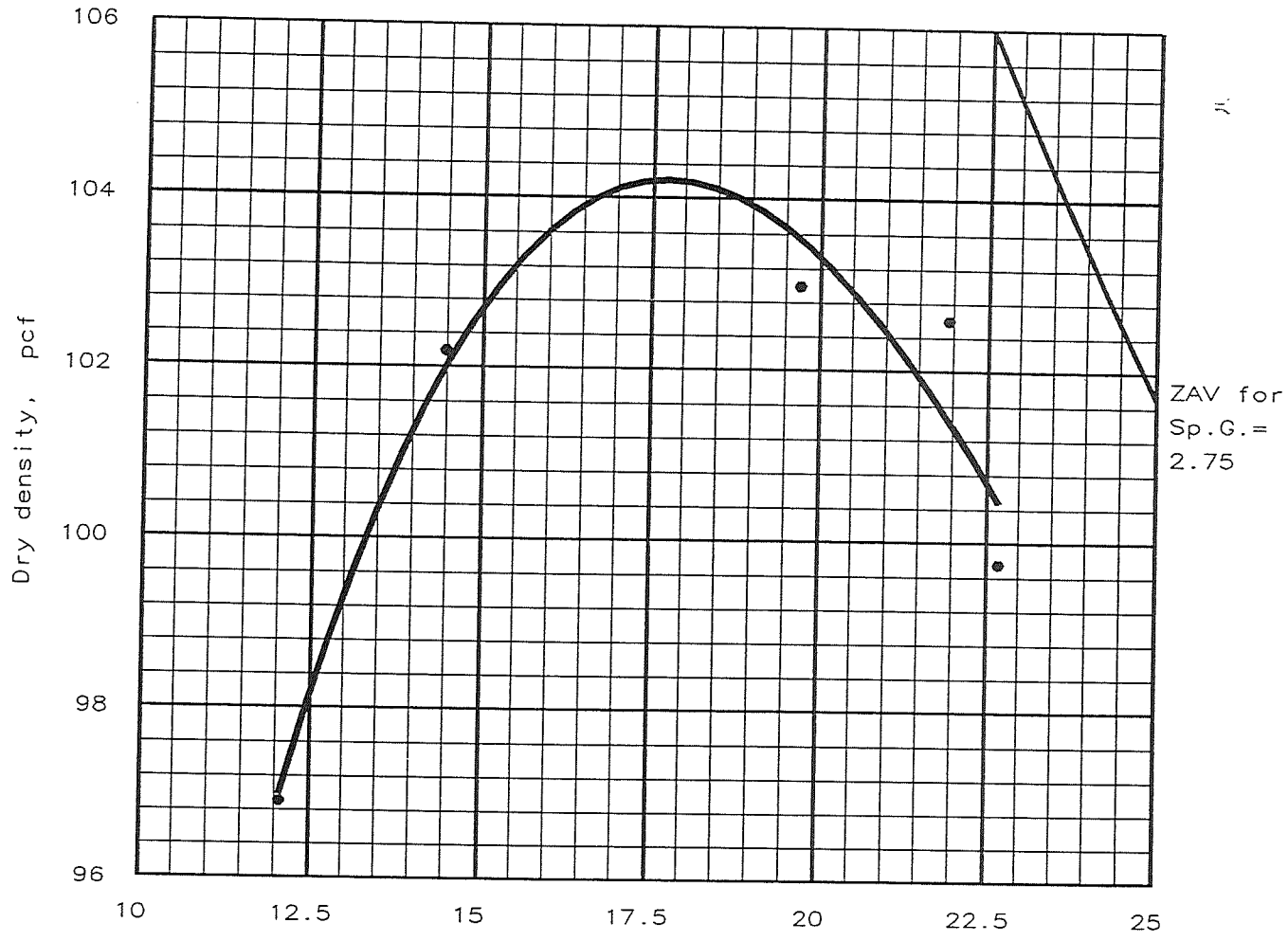


POINT NO.	1	2	3	4	5
WM + WS	13.27	13.46	13.55	13.57	13.56
WM	9.41	9.41	9.41	9.41	9.41
WW+T #1	577.70	557.90	571.90	589.20	584.20
WD+T #1	517.80	487.30	490.90	505.50	497.20
TARE #1	74.40	74.80	74.70	73.30	75.50
MOIST #1	13.5	17.1	19.5	19.4	20.6
MOISTURE	13.5	17.1	19.5	19.4	20.6
DRY DEN	102.0	103.7	104.0	104.6	103.2

Max dry den= 104.4 pcf, Opt moisture= 18.8 %

ersize Correction Not Applied

MOISTURE DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure A, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
7'-9.5	CL		27.5 %		33.4	12.4	0.0 %	99.2 %

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104.2 pcf Optimum moisture = 17.7 %	Yellowbrown Clayey SILT, Trace sand

Project No.: 946 02 000
Project: Vernon Co. Clay Test Pit
Location: TP-10

Date: 5/18/05

MOISTURE DENSITY RELATIONSHIP TEST

CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Fig. No. 1

MOISTURE-DENSITY TEST DATA DATA FILE: 143

PROJECT DATA

ıte:	5/18/05
:oject No.:	946 02 000
:oject:	Vernon Co. Clay Test Pit
)cation 1:	TP-10

:marks 1:

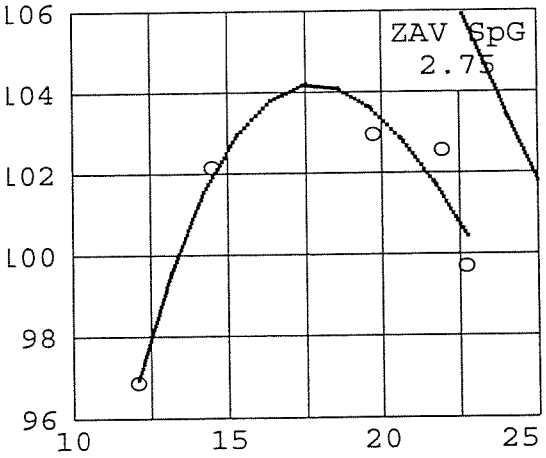
ıterial 1:	Yellowbrown Clayey SILT,
:scription 2:	Trace sand
.evation or depth:	7'-9.5
.g. No.:	1

SPECIMEN DATA

;CS classification: CL AASHTO classification:
ıtural moisture: 27.5 Specific gravity:
:rcent retained on No.4 sieve: 0.0
:rcent passing No. 200 sieve: 99.2
.quid limit: 33.4 Plastic limit: 21 Plasticity index: 12.4

TEST DATA AND RESULTS FOR CURVE 1

'pe of test: Standard, ASTM D 698-91 Procedure A



POINT NO.	1	2	3	4	5
WM + WS	13.03	13.31	13.52	13.58	13.49
WM	9.41	9.41	9.41	9.41	9.41
WW+T #1	570.70	573.30	570.20	533.40	599.20
WD+T #1	517.30	510.20	488.80	450.80	502.30
TARE #1	74.70	74.50	75.90	74.10	75.40
MOIST #1	12.1	14.5	19.7	21.9	22.7
MOISTURE	12.1	14.5	19.7	21.9	22.7
DRY DEN	96.9	102.2	103.0	102.6	99.8

Max dry den= 104.2 pcf, Opt moisture= 17.7 %

'ersize Correction Not Applied

APPENDIX H

PERMEABILITY TEST RESULTS

CWE Falling Head Permeability Test

Project: Vernon County Balefill
Project No. 946-02-00
Sample No. TP-7/ S-1
Sample Type: Test pits

Area of Standpipe (sq cm):	1.77	Diameter (cm):	4.9
Sample Height (cm):	7.1	Dry Density (lb/ft^3):	125.8
Sample Area (sq cm):	18.85	% Moisture:	22.9%
		Additonal Height(cm)	157.8

Trial	Initial Readings			Final Readings			Elapsed	Initial	Final	Permeability
	Date (dy/mn/yr)	Time (hr:mn:sc)	Height (cm)	Date (dy/mn/yr)	Time (hr:mn:sc)	Height (cm)	Time (seconds)	Head (cm)	Head (cm)	K (cm/sec)
1	06/12/05	13:10:00	53.5	06/13/05	13:10:00	53.1	86,400	211.3	210.9	1.46E-08
2	06/13/05	13:10:00	53.1	06/14/05	13:15:00	52.8	86,700	210.9	210.6	1.09E-08
3	06/14/05	13:15:00	52.8	06/15/05	13:06:00	52.5	85,860	210.6	210.3	1.11E-08
4	06/15/05	13:06:00	52.5	06/16/05	13:25:00	52.1	87,540	210.3	209.9	1.45E-08
5	06/16/05	13:25:00	52.1	06/17/05	13:26:00	51.7	86,460	209.9	209.5	1.47E-08
6	06/17/05	13:26:00	51.7					209.5		
7										
8										
9										
10										
11										
12										
13										
14										

Ave K_t= 1.32E-08

CWE Falling Head Permeability Test

Project: Vernon County Balefill
Project No. 946-02-00
Sample No. TP-3/ S-1
Sample Type: Test pits

Area of Standpipe (sq cm):	1.77	Diameter (cm):	4.9
Sample Height (cm):	7.2	Dry Density (lb/ft^3):	118.4
Sample Area (sq cm):	18.85	% Moisture:	19.8%
		Additonal Height(cm)	157.8

Trial	Initial Readings			Final Readings			Elapsed	Initial	Final	Permeability
	Date (dy/mn/yr)	Time (hr:mn:sc)	Height (cm)	Date (dy/mn/yr)	Time (hr:mn:sc)	Height (cm)	Time (seconds)	Head (cm)	Head (cm)	K (cm/sec)
1	06/12/05	13:11:00	45.0	06/13/05	13:11:00	44.2	86,400	202.8	202	3.09E-08
2	06/13/05	13:11:00	44.2	06/14/05	13:14:00	41.8	86,580	202.0	199.6	9.33E-08
3	06/14/05	13:14:00	41.8	06/15/05	13:05:00	39	85,860	199.6	196.8	1.11E-07
4	06/15/05	13:05:00	39.0	06/16/05	13:24:00	36.2	87,540	196.8	194	1.11E-07
5	06/16/05	13:24:00	36.2	06/17/05	13:25:00	33.5	86,460	194.0	191.3	1.10E-07
6	06/17/05	13:25:00	33.5					191.3		
7										
8										
9										
10										
11										
12										
13										
14										

Ave K_t= 9.12E-08

CWE Falling Head Permeability Test

Project: Vernon Co. Clay Test Pit
Project No. 946-02-00
Sample No. TP-10/S-2
Sample Type: Test Pits

Area of Standpipe (sq cm):	1.77	Diameter (cm):	5
Sample Height (cm):	7.1	Dry Density (lb/ft^3):	106.24 lb./cu.ft.
Sample Area (sq cm):	19.63	% Moisture:	21.9%
		Additonal Height(cm)	157.8

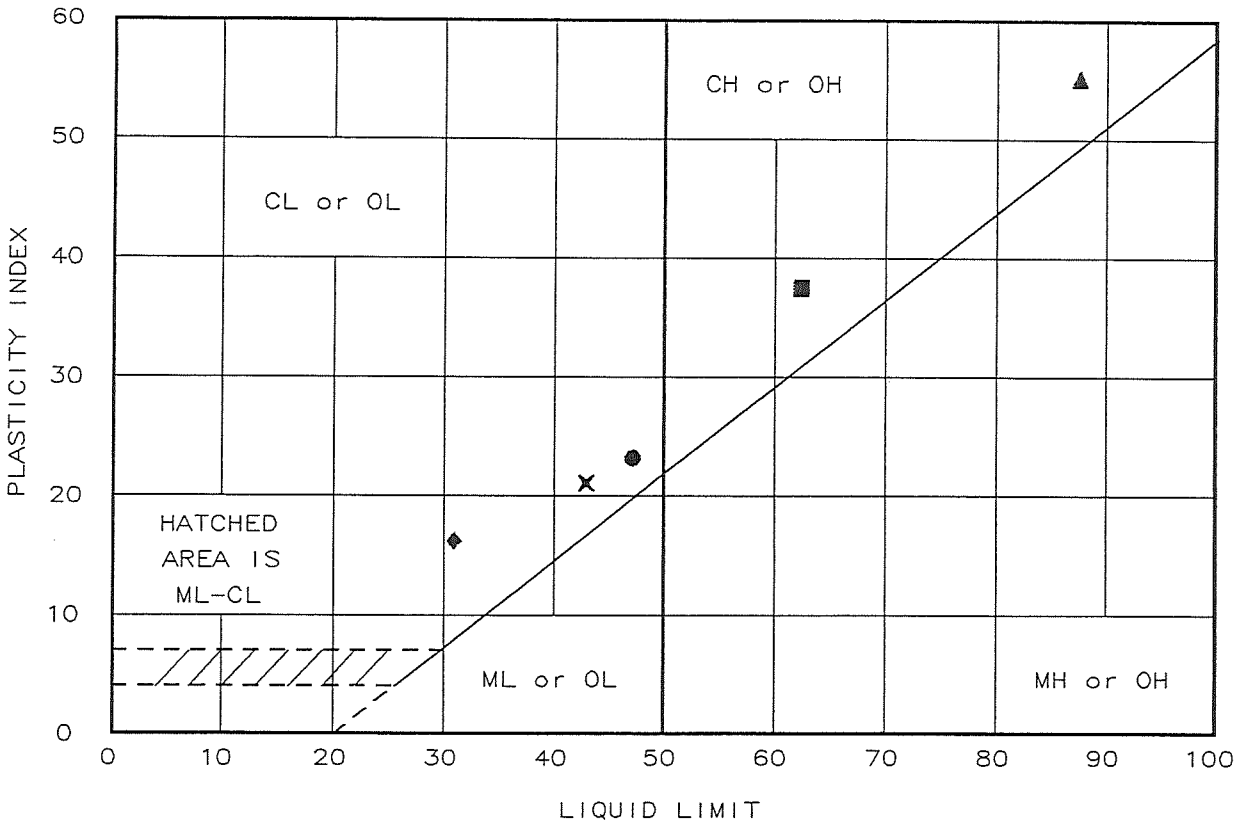
Trial	Initial Readings			Final Readings			Elapsed Time	Initial Head	Final Head	Permeability K
	Date (dy/mn/yr)	Time (hr:mn:sc)	Height (cm)	Date (dy/mn/yr)	Time (hr:mn:sc)	Height (cm)	(seconds)	(cm)	(cm)	(cm/sec)
	06/26/05	13:00:00	58.0	06/27/05	13:05:00	54.7	86,700	215.8	212.5	1.14E-07
2	06/27/05	13:05:00	54.7	06/28/05	13:00:00	47.1	86,100	212.5	204.9	2.71E-07
3	06/28/05	13:00:00	47.1	06/29/05	15:00:00	35.6	93,600	204.9	193.4	3.95E-07
4	06/29/05	15:00:00	35.6	06/30/05	16:33:00	33.4	91,980	193.4	191.2	7.96E-08
5	06/30/05	16:33:00	33.4	07/01/05	12:47:00	28.8	72,840	191.2	186.6	2.14E-07
6	07/01/05	12:47:00	28.8					186.6		
7										
8										
9										
10										
11										
12										
13										
14										

Ave K_t= 2.15E-07

APPENDIX I

ATTERBERG LIMITS TEST RESULTS

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-90
●	TP-1/S-1 1.5'-3.5' Lt. brown clayey SILT, lit. sand, trace gravel	47.2	24.0	23.2	90.2	CL, Lean clay
▲	TP-1/S-2 3.5'-5.0' Lt. brown silty CLAY, trace sand & gravel	87.5	32.4	55.1	95.0	CH, Fat clay
■	TP-2/S-2 3'-4.4' Yellowbrown silty sandy CLAY, little gravel	62.4	24.9	37.5	74.4	CH, Fat clay with sand
◆	TP-3/S-2 3'-5' Lt. brown clayey sandy SILT, trace gravel	30.9	14.7	16.2	80.7	CL, Lean clay with sand
×	TP-6/S-1 1.0'-2.5' Yellowbrown clayey SILT, trace sand & gravel	42.9	21.8	21.1	96.2	CL, Lean clay

Project No.: 946-02-000
Project: Vernon Co. Clay Test Pit

Client: Vernon Co. Landfill
Location:

Date: 3/17/05

LIQUID AND PLASTIC LIMITS TEST REPORT

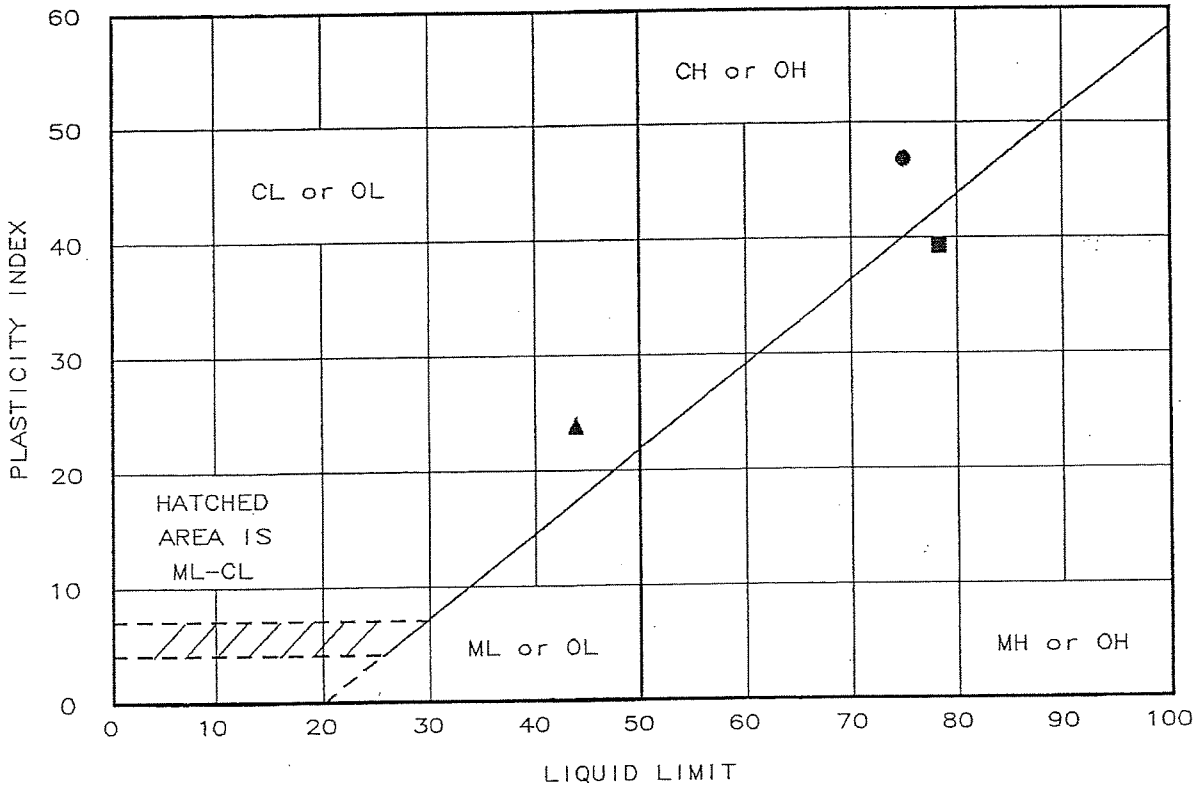
CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Plastic bag samples

Fig. No. 1

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-90
●	TP-6/S-2 2.5'-4.6' Yellowbrown silty CLAY, little sand	74.9	28.1	46.8	89.7	CH, Fat clay
▲	TP-7/S-1 1'-2' Yellowbrown clayey SILT, trace sand & gravel	43.9	20.0	23.9	95.5	CL, Lean clay
■	TP-7/S-2 2'-2.5' Brown silty CLAY, little sand & gravel	78.3	39.0	39.3	94.7	MH, Elastic silt

Project No.: 946-02-000
Project: Vernon Co. Clay Test Pit

Client: Vernon Co. Landfill
Location:

Date: 3/18/05

LIQUID AND PLASTIC LIMITS TEST REPORT

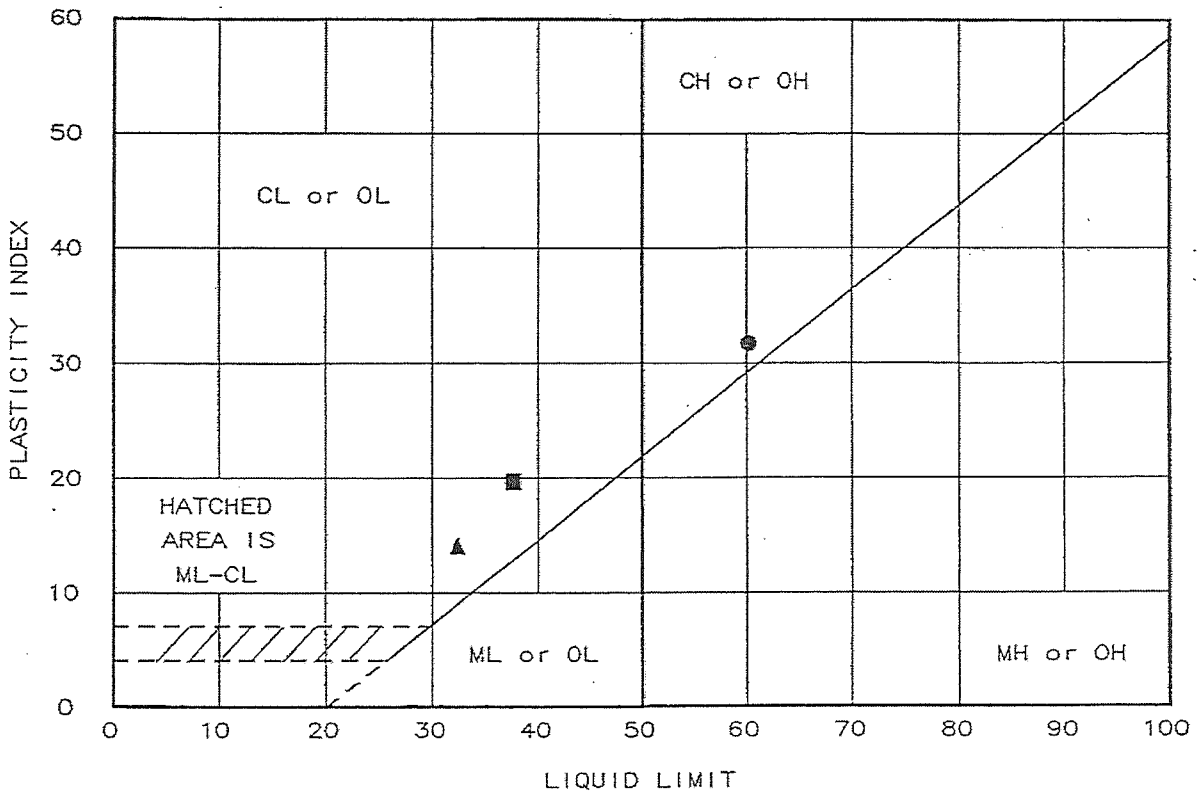
CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Plastic bag samples

Fig. No. 1

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-90
●	TP-11/S-2 4.2'-6.8' Dark yellowbrown silty CLAY, little sand, trace gravel	60.2	28.5	31.7	88.2	CH, Fat clay
▲	TP-13/S-2 4'-5' Yellowish brown silty sandy CLAY, trace gravel	32.4	18.3	14.1	62.2	CL, Sandy lean clay
■	TP-11/S-1 1.2'-4.2' Dark yellowbrown clayey SILT, trace sand	37.7	18.0	19.7	97.4	CL, Lean clay

Project No.: 946-02-000
Project: Vernon Co. Clay Test Pit

Client: Vernon Co. Landfill
Location:

Date: 3/25/05

Remarks:

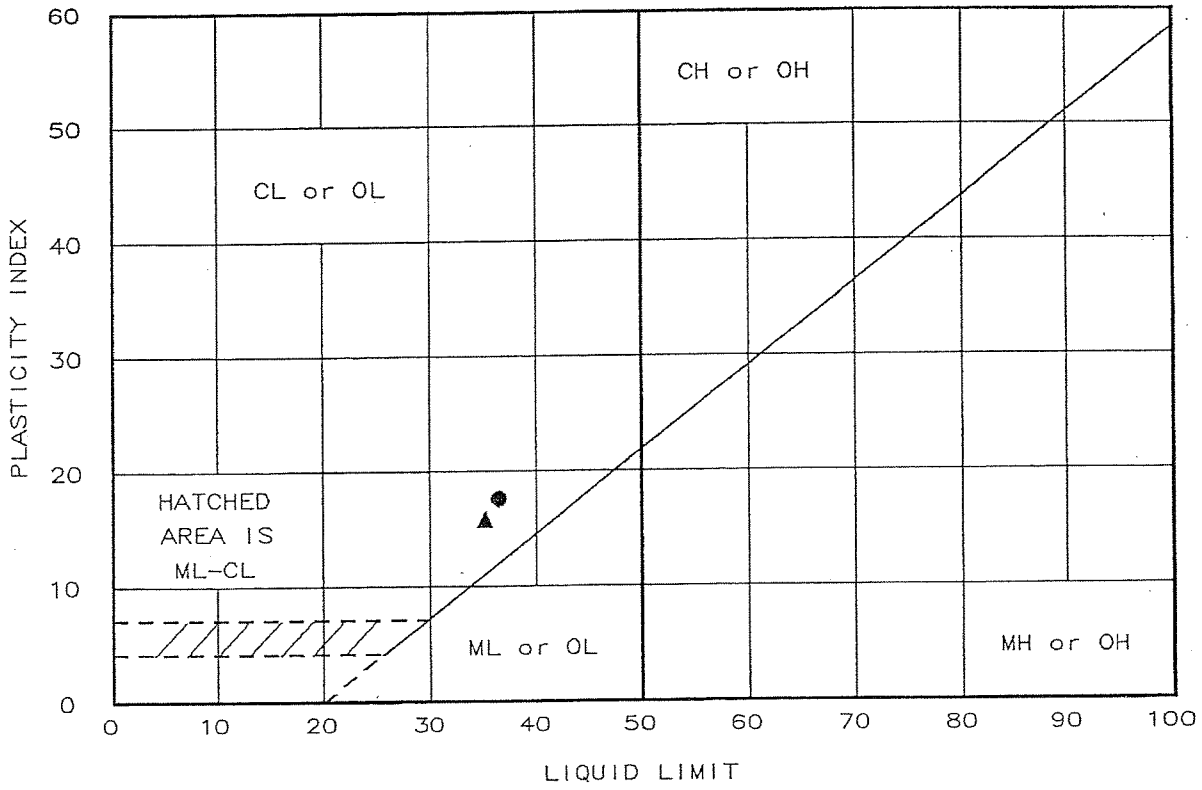
Plastic bag samples

LIQUID AND PLASTIC LIMITS TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Fig. No. 1

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-90
●	TP-13/S-1 1'-4' Dark yellowbrown clayey SILT, trace sand	36.5	18.9	17.6	98.7	CL, Lean clay
▲	TP-12/S-1 1'-3.2' Dark yellowishbrown clayey SILT, trace sand	35.2	19.4	15.8	97.8	CL, Lean clay

Project No.: 946-02-000
Project: Vernon Co. Clay Test Pit

Client: Vernon Co. Landfill
Location:

Date: 4/1/05

LIQUID AND PLASTIC LIMITS TEST REPORT

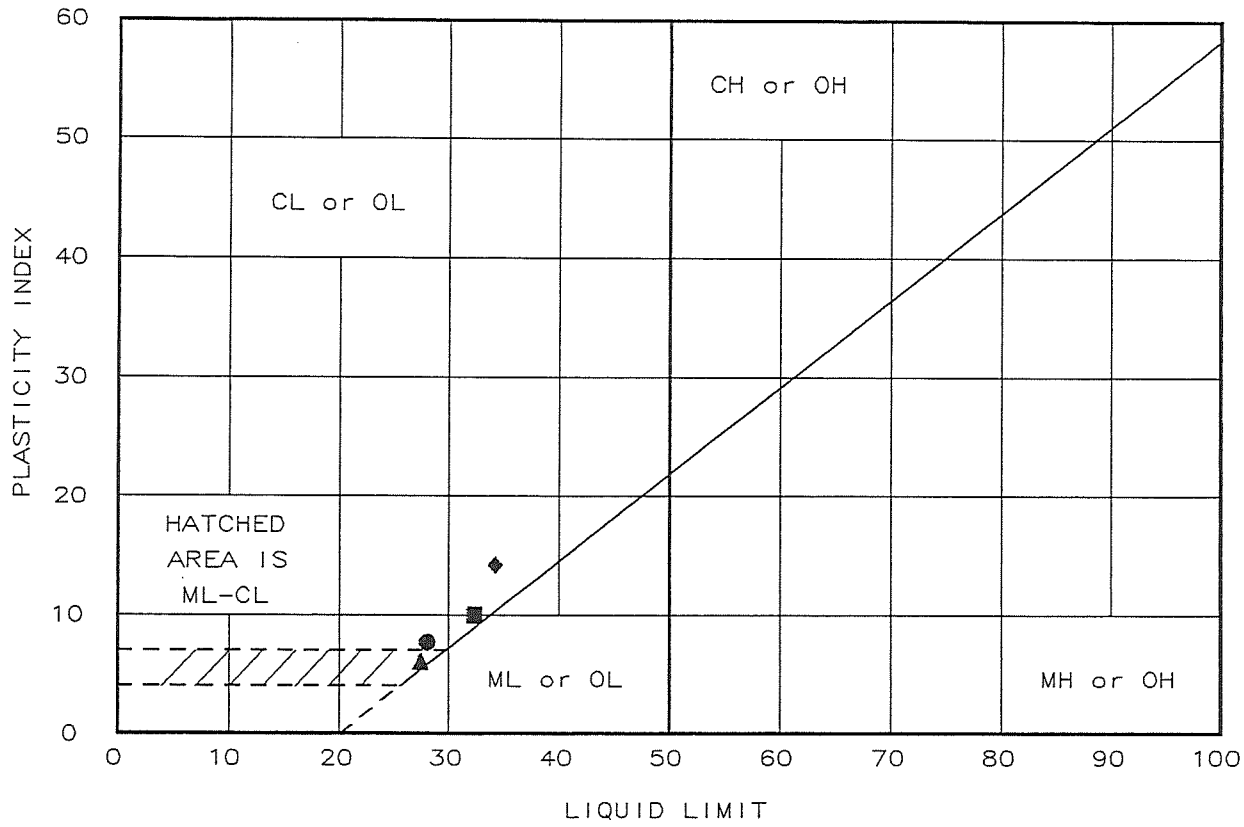
CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Plastic bag samples

Fig. No. 1

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-90
●	TP-14/S-1 1'-3' Dark yellowbrown clayey SILT, trace sand	28.1	20.4	7.7	99.0	CL, Lean clay
▲	TP-15/S-1 1.2'-3.5' Dark yellowbrown clayey SILT, trace sand	27.5	21.4	6.1	99.7	CL-ML, Silty clay
■	TP-15/S-2 7'-9.2' Dark yellowbrown clayey SILT, trace sand	32.3	22.3	10	99.4	CL, Lean clay
◆	TP-10/S-1 1.5'-3.5' Yellowbrown clayey SILT, trace sand	34.2	20.0	14.2	99.1	CL, Lean clay

Project No.: 946-02-000
Project: Vernon Co. Clay Test Pit

Client: Vernon Co. Landfill
Location:

Date: 4/4/05

Remarks:

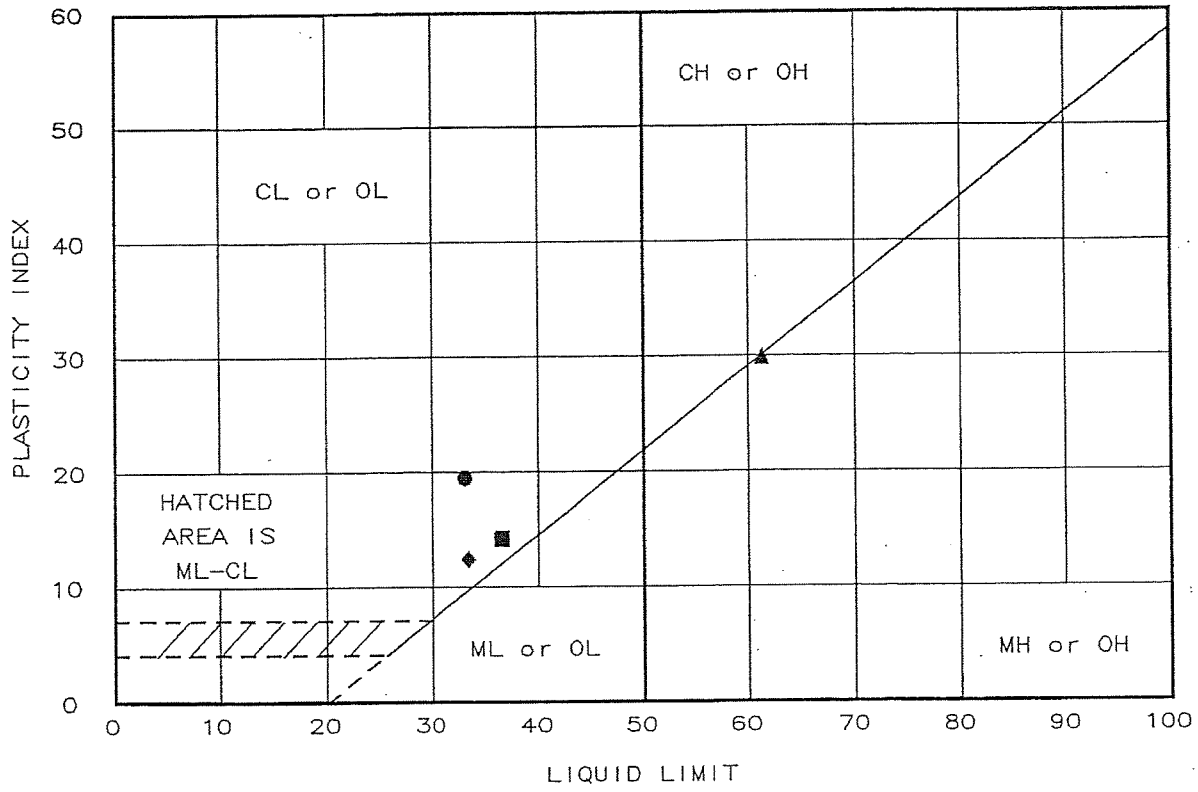
Plastic bag samples

LIQUID AND PLASTIC LIMITS TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Fig. No. 1

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-90
●	TP-2/S-1 1.4'-3' Dark yellowbrown clayey SILT, little sand	33.1	13.6	19.5	91.1	CL, Lean clay
▲	TP-8/S-2 6'-7' Yellowbrown clayey sandy SILT, trace gravel			9	76.9	MH, Elastic silt with sand
■	TP-9/S-1 1'-2.5' Dark yellowbrown clayey SILT, trace sand	36.6	22.4	14.2	99.6	CL, Lean clay
◆	TP-10/S-2 7'-9.5' yellowbrown clayey SILT, trace sand	33.4	21.0	12.4	99.2	CL, Lean clay

Project No.: 946-02-000
Project: Vernon Co. Clay Test Pit

Client: Vernon Co. Landfill
Location:

Date: 4/5/05

Remarks:

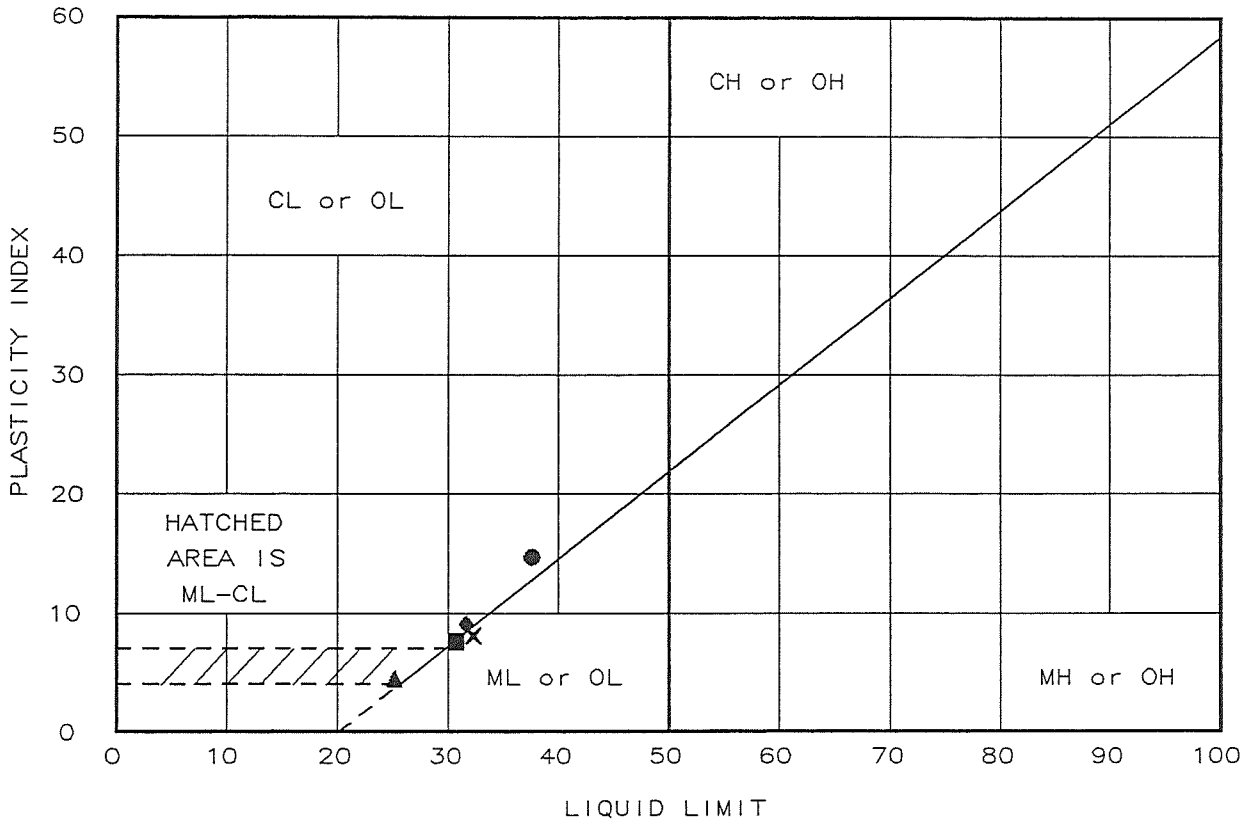
Plastic bag samples

LIQUID AND PLASTIC LIMITS TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Fig. No. 1

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-90
●	TP-5/S-1 1'-3' Yellowish brown clayey SILT, trace sand	37.6	22.9	14.7	99.4	CL, Lean clay
▲	TP-5/S-2 6'-7.6' Yellowbrown clayey SILT, little sand, trace gravel	25.1	20.6	4.5	88.9	CL-ML, Silty clay
■	TP-8/S-1 1'-3' Yellowbrown clayey SILT, trace sand	30.7	23.1	7.6	99.2	ML, Silt
◆	TP-9/S-2 7'-8.5' Dark yellowbrown clayey SILT, trace sand	31.6	22.5	9.1	99.5	CL, Lean clay
×	TP-14/S-2 6'-7.5' Dark yellowbrown clayey SILT, trace sand	32.3	24.2	8.1	99.6	ML, Silt

Project No.: 946-02-000
Project: Vernon Co. Clay Test Pit

Client: Vernon Co. Landfill
Location:

Date: 4/11/05

LIQUID AND PLASTIC LIMITS TEST REPORT

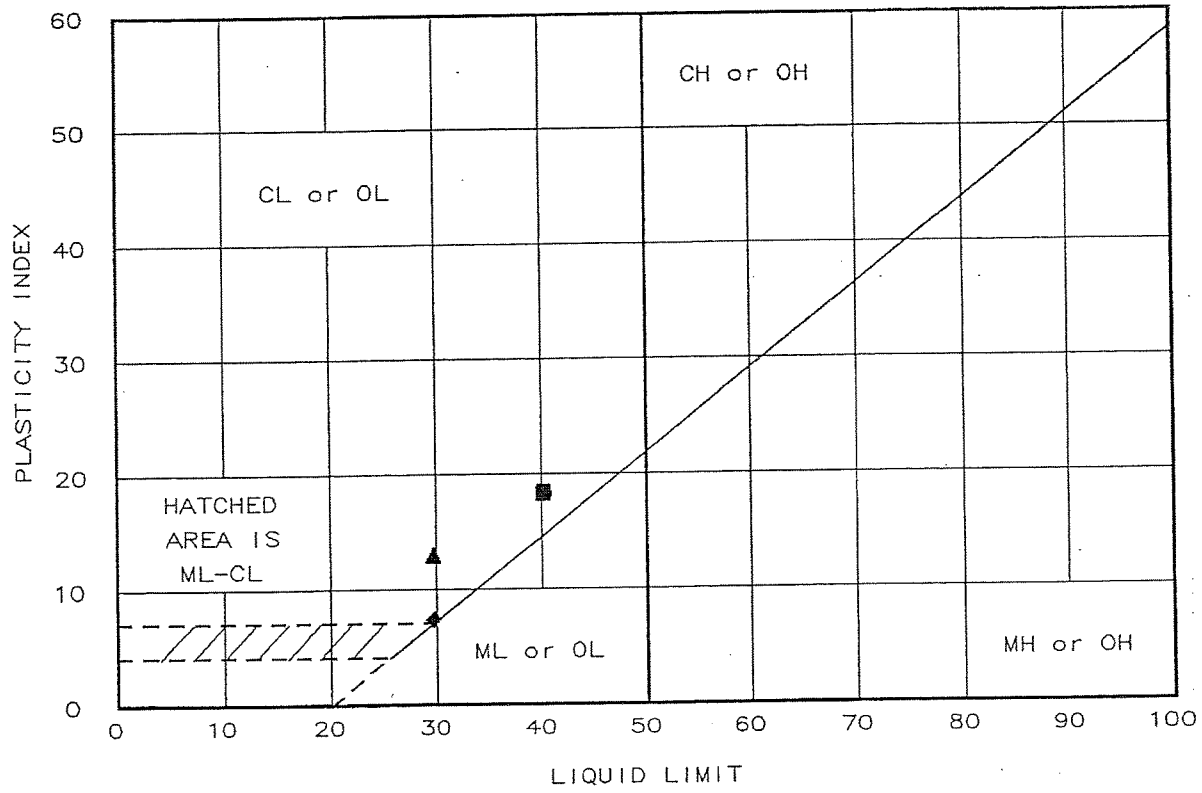
CENTRAL WISCONSIN ENGINEERS, INC.

Remarks:

Plastic bag samples

Fig. No. 1

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-90
●	TP-3/S-1 1.2'-3' Light brown clayey SILT, trace sand	40.3	22.0	18.3	99.0	CL, Lean clay
▲	TP-3/S-3 5'-8' Brown clayey SAND, little silt, trace gravel	29.7	16.7	13	32.2	SC, Clayey sand
■	TP-4/S-1 1.1'-5' Yellowish brown clayey SILT, trace sand	40.2	21.8	18.4	99.1	CL, Lean clay
◆	TP-4/S-2 8'-9.1' Yellowish brown clayey SILT, trace sand	29.7	22.3	7.4	98.9	CL, Lean clay

Project No.: 946-02-000
Project: Vernon Co. Clay Test Pit

Client: Vernon Co. Landfill
Location:

Date: 4/11/05

Remarks:

Plastic bag samples

LIQUID AND PLASTIC LIMITS TEST REPORT

CENTRAL WISCONSIN ENGINEERS, INC.

Fig. No. 1

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T-3 – Updated Isopach Maps for Clay Borrow Areas

NOTES:

1. GRAY CONTOURS REPRESENT EXISTING GRADE ELEVATIONS. CONTOUR INTERVAL IS 2-FOOT.
2. BOLD CONTOURS REPRESENT BOTTOM OF ACCEPTABLE CLAY ELEVATIONS. CONTOUR INTERVAL IS 5-FOOT.

VOLUME ANALYSIS:

BASE: BOTTOM OF CLAY
COMPARISON: TOP OF CLAY

CUT: 0 CY
FILL: 119,187 CY

NET: 119,187 CY

Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-0.39	0.00	
2	0.00	2.00	
3	2.00	5.00	
4	5.00	10.00	
5	10.00	20.00	

PROPERTY LINE

CLAY BORROW A
(APPROXIMATE EXTENTS)
(BOUNDARY USED FOR VOLUME ANALYSIS)

PHASE VI

PHASE V

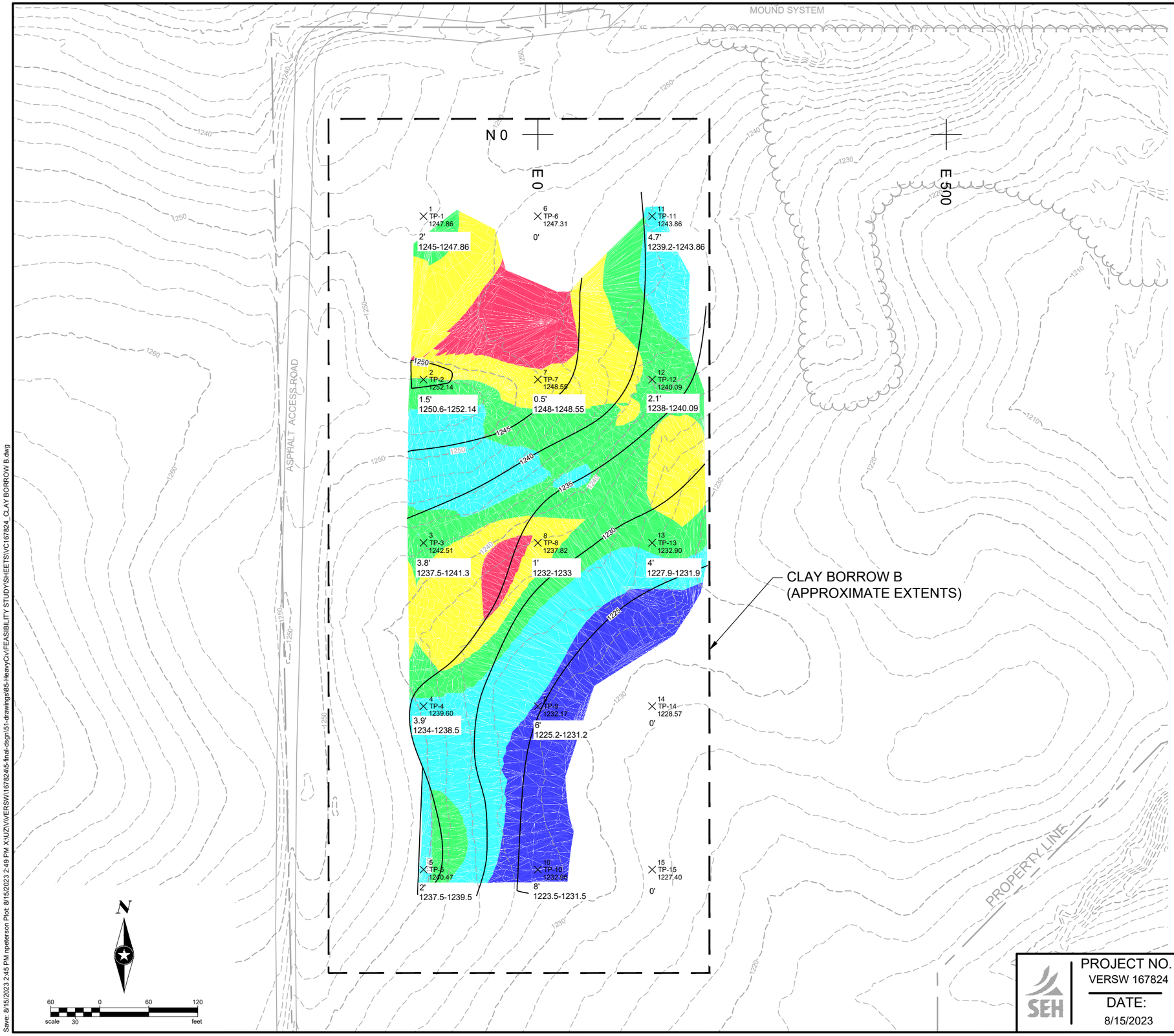
PHASE IV

N

60 0 60 120
scale 30 feet

PROJECT NO.		FIGURE
VERSW 167824	VERNON COUNTY LANDFILL FEASIBILITY STUDY ISOPACH MAP (UPDATED) CLAY BORROW A	NO. 1
DATE: 8/15/2023		

Save: 8/15/2023 2:34 PM npeterson Plot: 8/15/2023 2:55 PM X:\UZ\VW\VERSW\167824\5-final-dsgn\51-drawings\85-Heavy\Civ\FEASIBILITY STUDY\SHEETS\VC167824_CLAY BORROW A.dwg



NOTES:

1. GRAY CONTOURS REPRESENT EXISTING GRADE ELEVATIONS. CONTOUR INTERVAL IS 2-FOOT.
2. BOLD CONTOURS REPRESENT BOTTOM OF ACCEPTABLE CLAY ELEVATIONS. CONTOUR INTERVAL IS 5-FOOT.

VOLUME ANALYSIS:

BASE: BOTTOM OF CLAY
COMPARISON: TOP OF CLAY

CUT: 432 CY
FILL: 28,571 CY
(ONLY FILL CONSIDERED)

CLAY VOLUME = 28,571 CY

Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-1.69	0.00	
2	0.00	2.00	
3	2.00	4.00	
4	4.00	6.00	
5	6.00	8.72	

SEH

PROJECT NO.
VERSW 167824

DATE:
8/15/2023

VERNON COUNTY LANDFILL
FEASIBILITY STUDY
ISOPACH MAP (UPDATED)
CLAY BORROW B

FIGURE NO. 2

Save: 8/15/2023 2:45 PM npeterson Plot: 8/15/2023 2:49 PM X:\UZ\VVERSW\167824\5-final-dsgn\51-drawings\85-Heavy\Civ\FEASIBILITY STUDY\SHEETS\VC167824_CLAY BORROW B.dwg

Appendix U

Preliminary Storm Water Calculations

Building a Better World for All of Us®

MEMORANDUM

TO: Project File

FROM: Erik D. Henningsgard, PE (Lic. MN, WI)

DATE: August 28, 2023

RE: Vernon County Landfill Feasibility Study - Stormwater Considerations
SEH No. VERSW 167824 14.00

RESULTS

The Vernon County Landfill Feasibility Study is required for the expansion of the landfill. The relocation and expansion of the existing sedimentation basin is required to meet stormwater standards included in NR 504.09. The limiting factor in the required size for the ponds is the surface area to settle 0.015 mm particles during the 25-yr, 6hr storm event. The size of the basin is included on the proposed grading plans.

BACKGROUND

The Vernon County Landfill (Landfill) is planning to expand the landfill area to the east, encompassing areas that are currently occupied by grassed areas, woodland, stormwater drainage ditch, and an existing stormwater management basin. The expansion will require stormwater management controls to provide stormwater treatment to meet the DNR standards associated with NR 504.09. To meet the applicable standards the Landfill will relocate and expand the existing sedimentation basin.

This memo reviews the modeling considerations and stormwater pond sizing needs to meet the requirements of the DNR standards.

The project is exempt from NR 151 per NR 151.121(2)(a) “A post-construction site with less than 10 percent connected imperviousness, based on the area of land disturbance, provided the cumulative area of all impervious surfaces is less than one acre.” The only impervious area on the site is from the gravel access drives. Table 1 shows the disturbed area has 0.66% impervious area. Table 2 shows the cumulative impervious area is 2.73% of the entire site.

Table 1: Disturbed Areas	
Total Disturbed Area	9.05 Acre
Gravel Roads	0.06 Acre
Impervious Area Percentage	0.66%

Table 2: Site Areas	
Total Site Area	26.74 Acre
Gravel Roads	0.73 Acre
Impervious Area Percentage	2.73%

The pond sizing was completed to meet the following requirements:

NR 504.09 Standards

1. Settle the 0.015 mm size particles for all storms up to and including the 25-year, 6 hour storm.

2. Calculate the surface area of the sediment basin based on the intensity of a 25-year, 6 hour storm event.
3. Principal spillways designed to pass a 25-year, 6 hour time of concentration storm event.
4. Emergency spillways designed to pass the 100-year, 24 hour time of concentration storm event.
5. Design of the dewatering structures for sediment basins shall be dewatered in no less than 3 days.

HYDROLOGIC ANALYSIS

The watershed for the sedimentation basin consists of only the landfill site, which was delineated based on the completed grading design for the landfill expansion. A HydroCAD version 10.20-3c model was created using the delineated watershed, MSE4 distributions, and Atlas 14 rainfall depths for post-development scenarios.

The post-development model includes the landfill expansion and the land uses associated with the expansion. For the landfill areas a hydrologic soil group of D soils was utilized to account for compaction during construction. The expanded sedimentation basin, along with the proposed outlet structures were included in the modeling.

The HydroCAD modeling was utilized to design the size of the basin and the emergency spillway for the 100-year, 24 hour storm event. The modeling results show that the overflow weir safely conveys the 100-year storm event with 1 foot of freeboard. Table 3 below includes the critical elevations included in the modeling.

Table 3 – 100-year, 24 hour Storm Event Critical Elevations

Pond Elevations (feet)					
	Bottom of Basin	**Rate Control Culvert**	**Overflow Weir**	**Top of Bank**	**100-yr, 24 hr**
Sediment Basin	1176	1184	1188	1190	1188.79

SEDIMENT BASIN SURFACE AREA CALCULATION

To review compliance with the surface area sizing for the sediment basins, in accordance with NR 504.09, WDNR Technical Standard 1064 Sediment Basin was utilized. The technical standard includes the following equation for the calculation of the required surface area:

$$S_a = 1.2 * (q_{out} / v_s)$$

- S_a = Minimum Treatment Surface Area (square feet)
- q_{out} = Peak Outflow of the 25-year, 6 hour event (NR 504.09)
- v_s = Settling Velocity

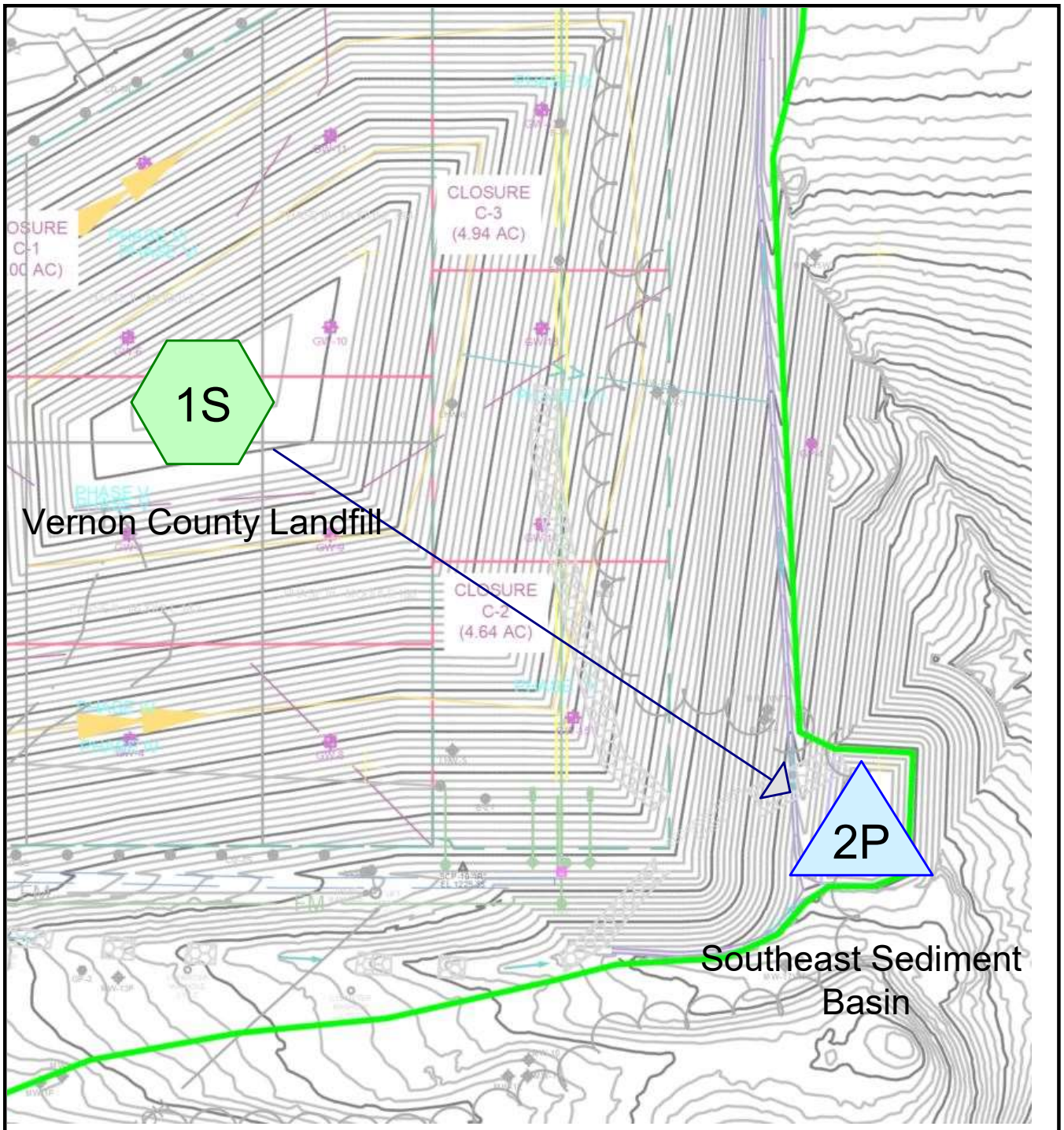
NR 504.09 requires the sizing of the sediment basin to settle the 0.015 mm, or 15 micron, particle size. According to Tech Standard 1064, Soil Class 2 includes particle sizes between 5 and 20 microns and includes a settling velocity of 7.3×10^{-5} ft/sec. Including the pond discharge rates for the 25-year, 6 hour storm event the basin is designed greater than the minimum size required as indicated in Table 4.

Table 4 – Sediment Basin Surface Area Design

	Sediment Basin
Pond Discharge (cfs)	1.38
Minimum Pond Surface (sf)	22,685
25-year Storm Pond Surface (sf)	25,031

Attachments: HydroCAD Modeling

x:\uz\v\versw\167824\5-final-dsgn\51-drawings\50-hydro\2023.0828 versw 167824 stormwater memo.docx



Subcat Reach Pond Link

Routing Diagram for Vernon County Landfill
Prepared by Short Elliott Hendrickson Inc, Printed 8/28/2023
HydroCAD® 10.20-3c s/n 00569 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: Vernon County Landfill

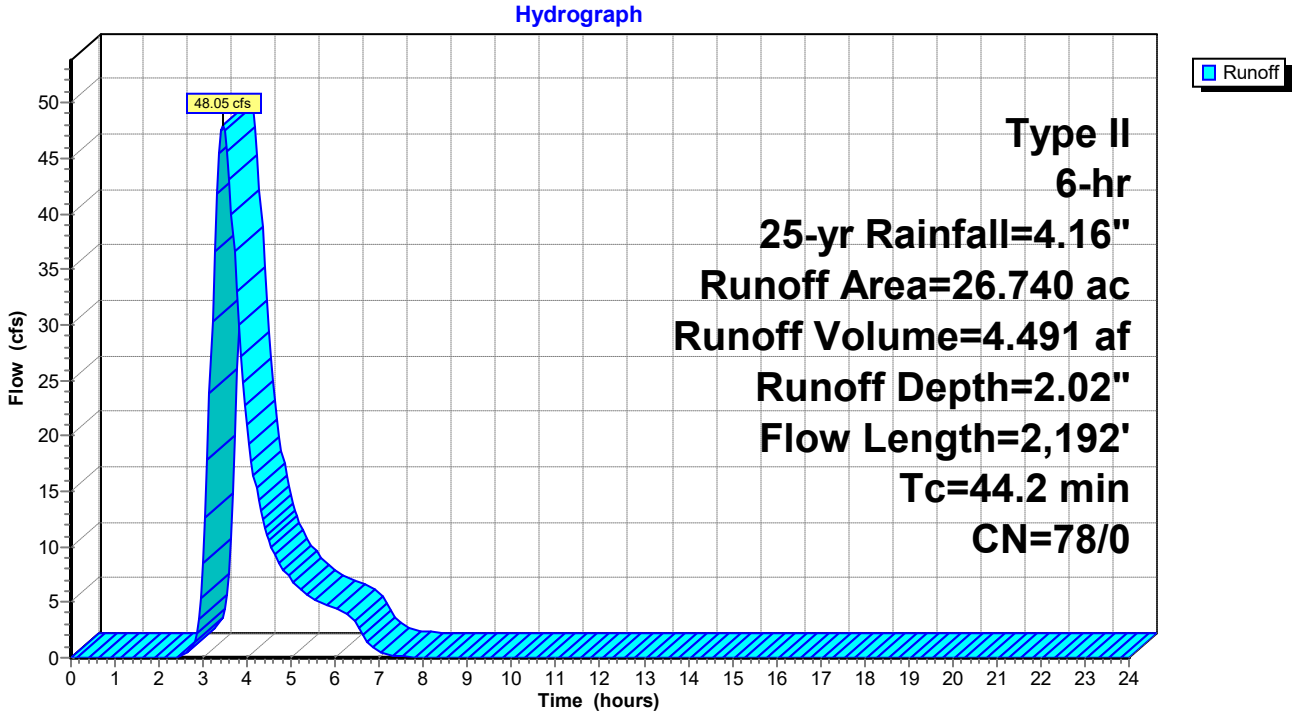
Runoff = 48.05 cfs @ 3.45 hrs, Volume= 4.491 af, Depth= 2.02"
Routed to Pond 2P : Southeast Sediment Basin

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 6-hr 25-yr Rainfall=4.16"

	Area (ac)	CN	Description
*	26.010	78	Grassland
*	0.730	96	Gravel Access Road
	26.740	78	Weighted Average
	26.740	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	100	0.2500	0.30		**Sheet Flow, Steep Sheet Flow** Grass: Dense n= 0.240 P2= 2.89"
22.2	200	0.0300	0.15		**Sheet Flow, Shallow Slope Sheet** Grass: Dense n= 0.240 P2= 2.89"
13.2	1,191	0.0100	1.50		**Shallow Concentrated Flow, Shallow Slope Waterway** Grassed Waterway Kv= 15.0 fps
3.3	701	0.0550	3.52		**Shallow Concentrated Flow, Steep Slope Waterway** Grassed Waterway Kv= 15.0 fps
44.2	2,192	Total			

Subcatchment 1S: Vernon County Landfill



Summary for Pond 2P: Southeast Sediment Basin

Inflow Area = 26.740 ac, 0.00% Impervious, Inflow Depth = 2.02" for 25-yr event
Inflow = 48.05 cfs @ 3.45 hrs, Volume= 4.491 af
Outflow = 1.45 cfs @ 6.73 hrs, Volume= 1.819 af, Atten= 97%, Lag= 197.2 min
Discarded = 0.08 cfs @ 6.73 hrs, Volume= 0.116 af
Primary = 1.38 cfs @ 6.73 hrs, Volume= 1.703 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,187.51' @ 6.73 hrs Surf.Area= 25,031 sf Storage= 180,938 cf

Plug-Flow detention time= 566.1 min calculated for 1.819 af (41% of inflow)
Center-of-Mass det. time= 523.9 min (766.4 - 242.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,176.00'	249,236 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,176.00	7,911	0	0
1,178.00	10,224	18,135	18,135
1,180.00	12,813	23,037	41,172
1,182.00	15,679	28,492	69,664
1,184.00	18,821	34,500	104,164
1,186.00	22,239	41,060	145,224
1,188.00	25,934	48,173	193,397
1,190.00	29,905	55,839	249,236

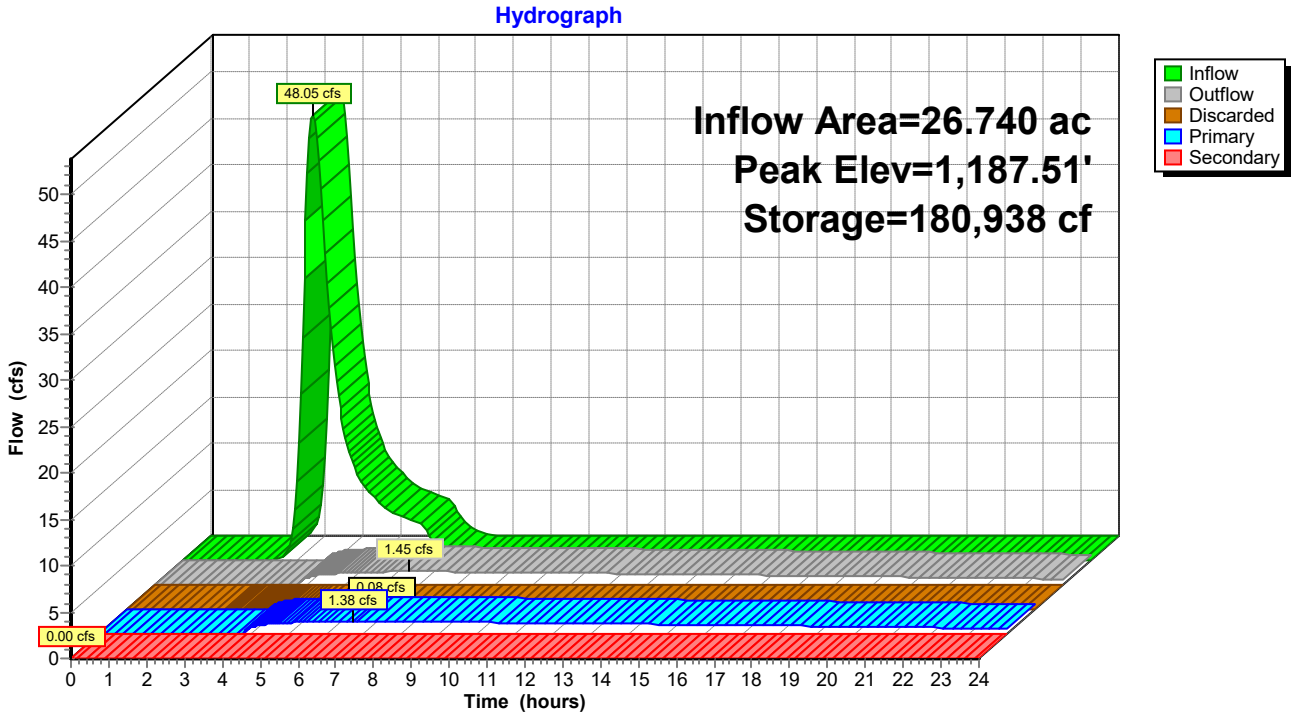
Device	Routing	Invert	Outlet Devices
#1	Secondary	1,188.00'	**30.0' long + 2.0 '/' SideZ x 21.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	1,176.00'	**0.130 in/hr Exfiltration over Surface area**
#3	Primary	1,184.00'	**6.0" Round Culvert** L= 45.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,184.00' / 1,183.55' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.08 cfs @ 6.73 hrs HW=1,187.51' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=1.38 cfs @ 6.73 hrs HW=1,187.51' (Free Discharge)
3=Culvert (Barrel Controls 1.38 cfs @ 7.01 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,176.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: Southeast Sediment Basin



Summary for Subcatchment 1S: Vernon County Landfill

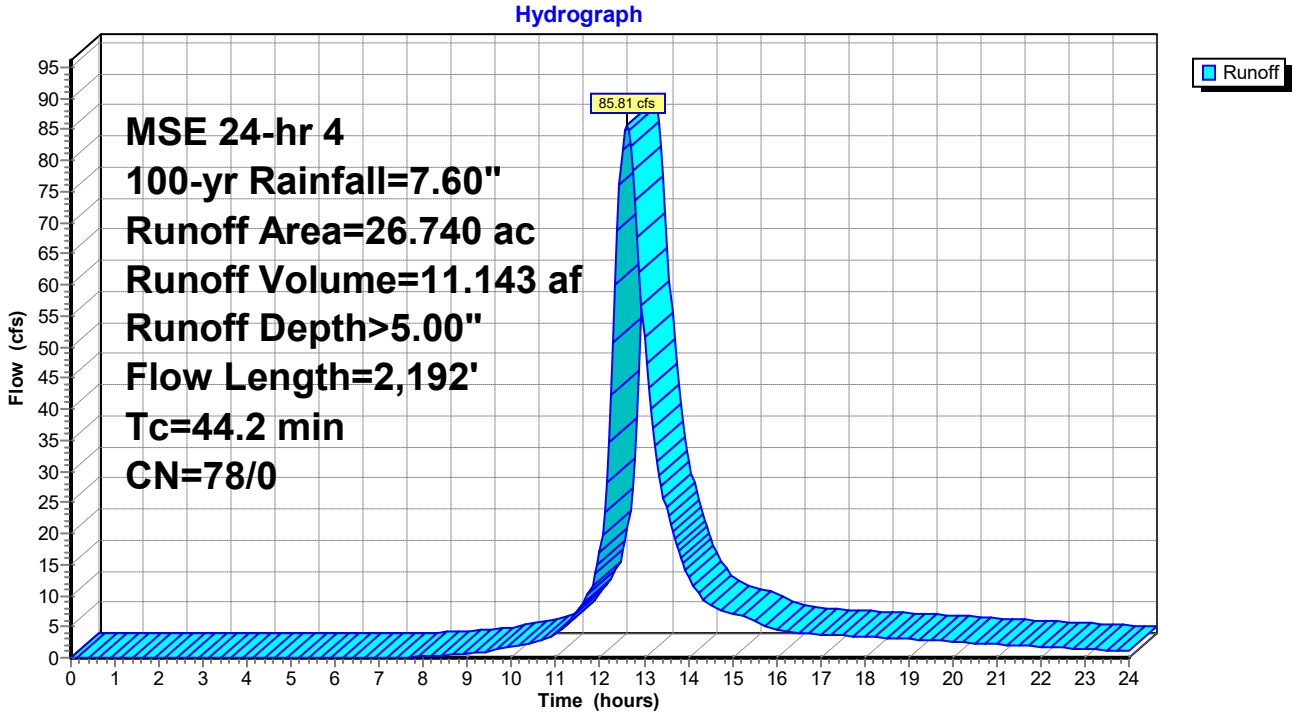
Runoff = 85.81 cfs @ 12.60 hrs, Volume= 11.143 af, Depth> 5.00"
Routed to Pond 2P : Southeast Sediment Basin

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-yr Rainfall=7.60"

	Area (ac)	CN	Description
*	26.010	78	Grassland
*	0.730	96	Gravel Access Road
	26.740	78	Weighted Average
	26.740	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	100	0.2500	0.30		**Sheet Flow, Steep Sheet Flow** Grass: Dense n= 0.240 P2= 2.89"
22.2	200	0.0300	0.15		**Sheet Flow, Shallow Slope Sheet** Grass: Dense n= 0.240 P2= 2.89"
13.2	1,191	0.0100	1.50		**Shallow Concentrated Flow, Shallow Slope Waterway** Grassed Waterway Kv= 15.0 fps
3.3	701	0.0550	3.52		**Shallow Concentrated Flow, Steep Slope Waterway** Grassed Waterway Kv= 15.0 fps
44.2	2,192	Total			

Subcatchment 1S: Vernon County Landfill



Summary for Pond 2P: Southeast Sediment Basin

Inflow Area = 26.740 ac, 0.00% Impervious, Inflow Depth > 5.00" for 100-yr event
Inflow = 85.81 cfs @ 12.60 hrs, Volume= 11.143 af
Outflow = 60.37 cfs @ 12.92 hrs, Volume= 6.733 af, Atten= 30%, Lag= 19.3 min
Discarded = 0.08 cfs @ 12.92 hrs, Volume= 0.086 af
Primary = 1.61 cfs @ 12.92 hrs, Volume= 1.419 af
Secondary = 58.67 cfs @ 12.92 hrs, Volume= 5.228 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,188.79' @ 12.92 hrs Surf.Area= 27,509 sf Storage= 214,591 cf

Plug-Flow detention time= 165.3 min calculated for 6.719 af (60% of inflow)
Center-of-Mass det. time= 78.6 min (910.6 - 832.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,176.00'	249,236 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,176.00	7,911	0	0
1,178.00	10,224	18,135	18,135
1,180.00	12,813	23,037	41,172
1,182.00	15,679	28,492	69,664
1,184.00	18,821	34,500	104,164
1,186.00	22,239	41,060	145,224
1,188.00	25,934	48,173	193,397
1,190.00	29,905	55,839	249,236

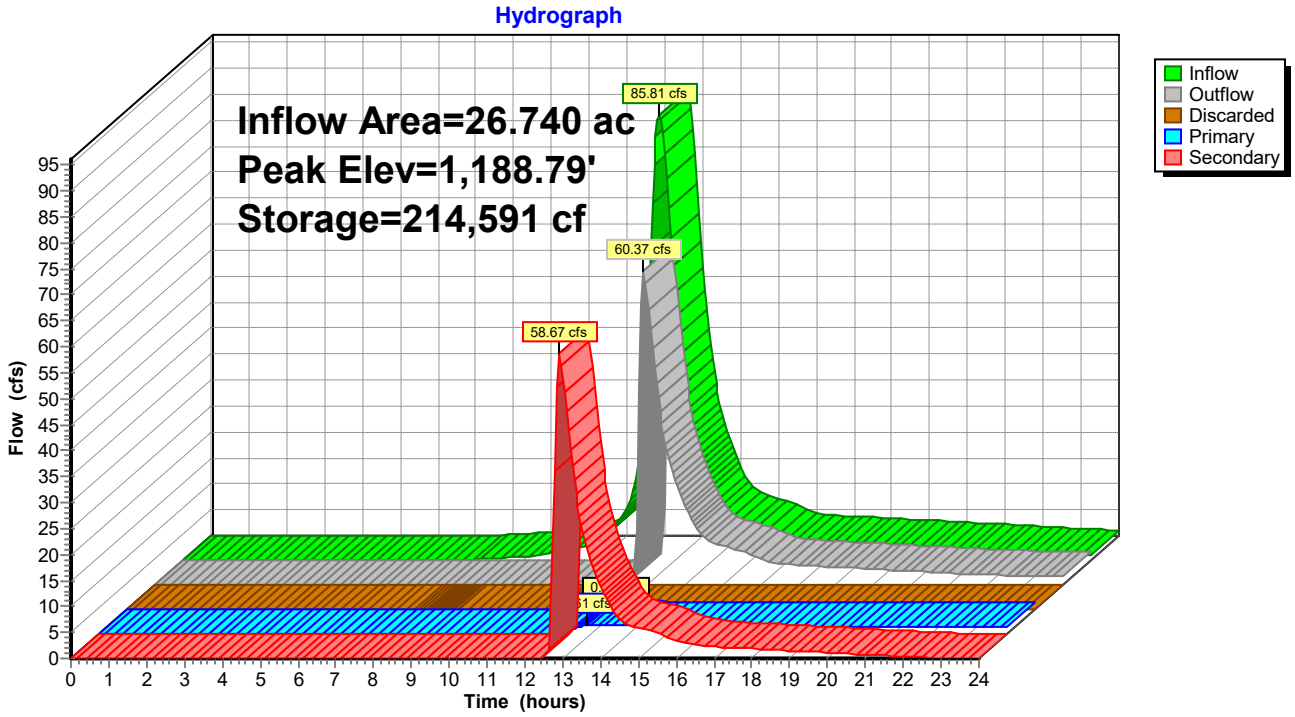
Device	Routing	Invert	Outlet Devices
#1	Secondary	1,188.00'	**30.0' long + 2.0 '/' SideZ x 21.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	1,176.00'	**0.130 in/hr Exfiltration over Surface area**
#3	Primary	1,184.00'	**6.0" Round Culvert** L= 45.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,184.00' / 1,183.55' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.08 cfs @ 12.92 hrs HW=1,188.79' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=1.61 cfs @ 12.92 hrs HW=1,188.79' (Free Discharge)
3=Culvert (Barrel Controls 1.61 cfs @ 8.20 fps)

Secondary OutFlow Max=57.63 cfs @ 12.92 hrs HW=1,188.79' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 57.63 cfs @ 2.32 fps)

Pond 2P: Southeast Sediment Basin



Building a Better World for All of Us®

Sustainable buildings, sound infrastructure, safe transportation systems, clean water, renewable energy and a balanced environment. Building a Better World for All of Us communicates a company-wide commitment to act in the best interests of our clients and the world around us.

We're confident in our ability to balance these requirements.

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