

Appendix J

Field Investigation Summary



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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

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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 completed 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-filled 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 byproduct 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 performed 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 H₂O 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 $9.5\text{E-}2$ cm/sec (MW-1R) to $1.0\text{E-}5$ 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 is 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 $1.18\text{E-}03$ cm/sec compared to 2003 result of $1.27\text{E-}02$ 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 $\frac{1}{4}$ 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
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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

Table 5 - Groundwater Elevations (2018-2023)

Table 6 - Baseline Monitoring Parameters

Table 7 - Baseline Monitoring Results

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 stabilizing 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
Page 1 of 10
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	--	--

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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						
	PAL	ES	MW-14WT						
			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	

Table 7
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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		Well No./Sampling Date						
	Standards		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					
	PAL	ES	MW-16					
			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	--	--

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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	
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).

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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						
	PAL	ES	MW-17WT						
			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

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 2

Facility/Project Name Vernon County Landfill Expansion		License/Permit/Monitoring Number 3268		Boring Number B-18	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec		Date Drilling Started 9/19/2022		Date Drilling Completed 9/19/2022	
Drilling Method hsa,mud rotary					
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,239.0 Feet MSL	Borehole Diameter 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			Local Grid Location Lat _____ ° _____ ' _____ " _____" Long _____ ° _____ ' _____ " _____" Feet ☐ N ☐ E Feet ☐ S ☐ W		

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 AU	24			LEAN CLAY (CL), brown to gray, moist, some sand, medium plasticity, mottled (Residuum)	CL					20	38	19	84	1% Gravel, 15% Sand
2 SS	18 7	2 3 4	1.5 3.0							27	64	40	86	0% Gravel, 14% Sand
3 SS	18 8	2 3 3	4.5 6.0							27	51	32	64	0% Gravel, 37% Sand
4 SS	18 14	3 7 8	7.5							10				
5 SS	18 14	3 7 9	9.0 10.5	CLAYEY SAND (SC), orangish brown, moist, fine grained, slightly cohesive (Residuum)	SC					15	39	24	41	0% Gravel, 59% Sand
6 SS	18 16	6 6 5	12.0 13.5							27	72	49	70.5	0% Gravel, 30% Sand
7 SS	18 16	5 8 8	15.0	LEAN CLAY (CL), dark brown to dark reddish brown, moist, little sand, medium plasticity, light brown sandy transition (Residuum)	CL					20				
8 SS	18 12	3 3 12	16.5 18.0							16				
9	18	14	19.5	WEATHERED SANDY DOLOSTONE, light brown, moist, fine grained, with fine to medium gravel, some clay (Saprolite)										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature <i>Anton [Signature]</i>	Firm Short Elliott Hendrickson Inc.	Tel: Fax:
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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.

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

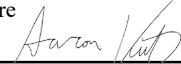
Page 1 of 2

Facility/Project Name Vernon County Landfill Expansion		License/Permit/Monitoring Number 3268		Boring Number B-19	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec		Date Drilling Started 9/19/2022		Date Drilling Completed 9/19/2022	
Drilling Method hsa,mud rotary					
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,233.3 Feet MSL	Borehole Diameter 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			Local Grid Location Lat _____ ° _____ ' _____ " _____" Long _____ ° _____ ' _____ " _____" Feet ☐ N ☐ E Feet ☐ S ☐ W		

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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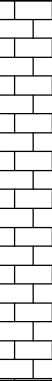
Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 AU	24			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	NOTE: sand seam from 7 to 7.5 feet, fine to medium grained.						53				
5 SS	18 14	2 2 2	9.0 10.5		CL					54				
6 SS	18 6	1 2 1	12.0 13.5	NOTE: gravel from 12.5 to 13.5 feet of weathered bedrock.						33				
7 SS	18 8	1 1 1	15.0	FAT CLAY (CH), brown, moist, little sand and gravel, high plasticity, soft (Residuum)						40				
8 SS	18 14	1 1 2	16.5 18.0		CH					57	105	71	97	0% Gravel, 3% Sand
9	18	0	19.5							57				

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm Short Elliott Hendrickson Inc.	Tel: Fax:
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Page 2 of 2

Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
SS X	6	15	21.0	WEATHERED SANDY DOLOSTONE, light brown to gray, moist, silt with sand and gravel, loose (Saprolite).										
			22.5											
			24.0											
			25.5											
10 SS X	18 4	50+	27.0											
11 SS X	18 1	50+		Boring Terminated at 28 feet.										

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

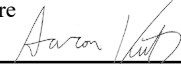
Page 1 of 2

Facility/Project Name Vernon County Landfill Expansion		License/Permit/Monitoring Number 3268		Boring Number B-20	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec		Date Drilling Started 9/19/2022		Date Drilling Completed 9/19/2022	
Drilling Method hsa,mud rotary					
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation 1,215.8 Feet MSL	Borehole Diameter 6.0 inches
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 164,064 N, 715,518 E S/C/N			Local Grid Location ☐ N ☐ E ☐ S ☐ W		
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W			Lat _____ ' _____" Long _____ ' _____"		

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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Sample 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	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 AU	24			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 3.0							19				
3 SS	18 12	3 4 6	4.5 6.0		CL					27				
4 SS	18 12	2 3 6	7.5	NOTE: decreased gravel content						33				
5 SS	18 12	2 12 11	9.0 10.5	SANDY LEAN CLAY (CL), brown, moist, low plasticity (Residuum)						15				
6 SS	18 12	3 4 5	12.0 13.5		CL					30				
7 SS	18 14	2 1 2	15.0							46				
8 SS	18 16	5 4 4	16.5 18.0	LEAN CLAY (CL), dark brown to brown, moist, little sand, low to medium plasticity (Residuum) NOTE: blue to green colored seam at 15 feet. NOTE: increased sand content between 17 to 17.5 feet.	CL					39				
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 	Firm Short Elliott Hendrickson Inc.	Tel: Fax:
--	---	--------------

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Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
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											
			28.5											
11 SS	 18 10	14 18 50+	30.0											
					Boring Terminated at 30 feet.									

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 2

Facility/Project Name Vernon County Landfill Expansion		License/Permit/Monitoring Number 3268		Boring Number B-21	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec		Date Drilling Started 9/19/2022		Date Drilling Completed 9/19/2022	
WI Unique Well No.		DNR Well ID No.		Common Well Name	
Final Static Water Level Feet MSL		Surface Elevation 1,226.1 Feet MSL		Borehole Diameter 6.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 163,857 N, 715,398 E S/C/N		Lat ° ' " Long ° ' "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W					

Facility ID 3268	County Vernon	County Code 63	Civil Town/City/ or Village Viroqua
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Sample 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	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 AU	24			LEAN CLAY (CL), brown, moist, medium to high plasticity, medium stiff (Fill)							67	48	75	0% Gravel, 25% Sand
2 SS	18 8	2 2 3	1.5 3.0		CL					24	50	34	76	0% Gravel, 25% Sand
3 SS	18 8	1 1 2	4.5 6.0							25				
4 SS	18 12	1 4 8	7.5	NOTE: trace to little gravel at 7.5 feet.						19				
5 SS	18 12	3 6 7	9.0 10.5	LEAN CLAY TO SILT (CL-ML), grayish brown, moist, low plasticity, medium stiff, trace roots/organics through 21 feet (Fill)						17	36	18	86	3% Gravel, 12% Sand
6 SS	18 14	3 7 8	12.0 13.5		CL-ML					19	36	14	86	0% Gravel, 6% Sand
7 SS	18 10	2 3 5	15.0 16.5							20				
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 <i>Anton [Signature]</i>	Firm Short Elliott Hendrickson Inc.	Tel: Fax:
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Page 2 of 2

Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
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) <i>(continued)</i>	CL-ML					19		13	99	5% Sand
10 SS	 18 12	4 7 8	22.5											
			24.0											
			25.5											
			27.0											
			28.5											
			30.0											
11 SS	 18 18													
Boring Terminated at 31 feet.														

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 4

Facility/Project Name Vernon County Landfill Expansion			License/Permit/Monitoring Number 3268		Boring Number MW-14WT	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec			Date Drilling Started 8/29/2022		Date Drilling Completed 9/20/2022	
Drilling Method hsa,mud rotary,coring						
WI Unique Well No. WC334	DNR Well ID No. 125	Common Well Name MW-14WT	Final Static Water Level 1,152.8 Feet MSL	Surface Elevation 1,247.2 Feet MSL	Borehole Diameter 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 ☐ S ☐ W	
Facility ID 3268		County Vernon	County Code 63	Civil Town/City/ or Village Viroqua		

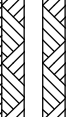
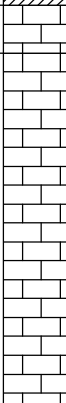
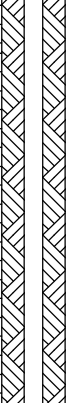
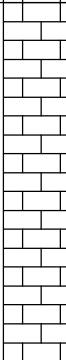
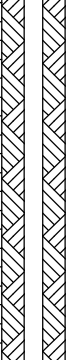
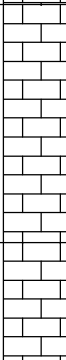
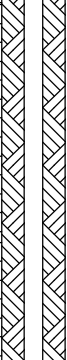
Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 AU	24			LEAN CLAY WITH SAND (CL), brown to light brown, moist, medium plasticity, mottled (Residuum)										
2 SS	18 18	3 6 7	1.5 3.0		CL									
3 SS	18 18	4 7 7	4.5 6.0	FAT CLAY WITH SAND (CH), light brown, moist, little gravel, stiff (Residuum) NOTE: Mottled below 7 feet bgs.										
4 SS	18 18	4 3 6	7.5		CH					37	64	42	68	0% Gravel, 32% Sand
5 SS	18 6	3 6 11	9.0 10.5											
6 SS	18 16	3 4 8	12.0 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 16.5	FAT CLAY (CH), brown to reddish brown, moist, little sand, stiff (Residuum) NOTE: Light brown sand layer <1" thick at 15 feet bgs.	CH									
8 SS	18 18	14 12 8	18.0											
9 X	18	6	19.5											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature <i>Ben Korte</i>	Firm Short Elliott Hendrickson Inc.	Tel: Fax:
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Boring Number **MW-14WT** Use only as an attachment to Form 4400-122.

Page 2 of 4

Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
SS	18	8 12	21.0	FAT CLAY (CH), brown to reddish brown, moist, little sand, stiff (Residuum) (continued)	CH									
			22.5											
			24.0											
10 SS	18 18	4 9 11	25.5		CL									
			27.0	SANDY LEAN CLAY (CL), brown, moist, stiff										
11 SH	6	6	28.5											Permeability = 3.1E-08 cm/sec
12 SS	6	50+	30.0	DOLOSTONE, fractured, hard drilling from 28.5 to 33.5 feet, switched to mud rotary at 33.5 feet										
13 SS	2	50+	31.5	No recovery										
			33.0											
			34.5											
14 SS	0 0	50+	36.0											Poor RQD (10%)
			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										
			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											
			49.5											
17 SS	5 4	50+	51.0	SAND, light brown, poorly graded, fine to coarse										
18	96		52.5											Poor RQD

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Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
RC	39		54.0 55.5 57.0 58.5 60.0 61.5 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	DOLOSTONE, gray to brown, fine grained, 5 to 10mm vugs throughout with mineralization, chert at approximately 53.0 feet, very fractured, difficult coring. (continued) End of coring at 60.5 feet due to formation too difficult to core.									(19.5%)	

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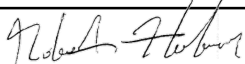
Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 4

Facility/Project Name Vernon County Landfill Expansion			License/Permit/Monitoring Number 3268		Boring Number MW-15WT	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec			Date Drilling Started 9/26/2022		Date Drilling Completed 9/27/2022	
Drilling Method hsa,mud rotary						
WI Unique Well No. WC335	DNR Well ID No. 127	Common Well Name MW-15WT	Final Static Water Level 1,136.4 Feet MSL	Surface Elevation 1,220.6 Feet MSL	Borehole Diameter 6.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 164,382 N, 715,726 E S/C/N			Lat ° ' " Long ° ' "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W						
Facility ID 3268		County Vernon	County Code 63	Civil Town/City/ or Village Viroqua		

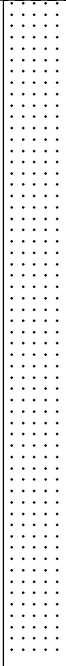
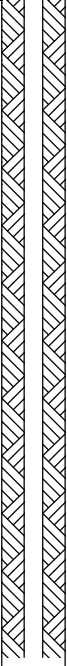
Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 AU	24			SILTY SAND (SM), dark brown, moist, fine grained, trace organics (Topsoil)	SM									
2 SS	18 14	5 6 7	1.5 3.0	LEAN CLAY WITH SAND (CL), brown to dark brown, moist, with silt, low plasticity (Residuum)	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									
5 SS	18 14	6 6 22	9.0 10.5	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)	CL									
6 SS	18 14	3 4 5	12.0 13.5	NOTE Occasional sand layers throughout sample 5. NOTE: Sample 6 highly disturbed due to gravel.										
7 SS	18 16	3 3 4	15.0	FAT CLAY (CH), brown to reddish brown, moist, high plasticity, mottled, with sand (Residuum)	CH									
8 SS	18 18	2 4 4	16.5 18.0							46	109	73	97	0% Gravel, 3% Sand
9	18	2	19.5	NOTE: Started mud rotary drilling after sample 8.										

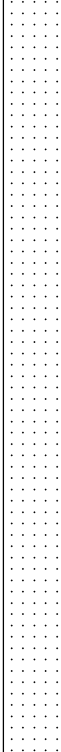
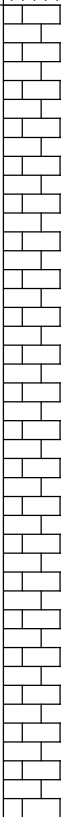
I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm Short Elliott Hendrickson Inc.	Tel: Fax:
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Boring Number **MW-15WT** Use only as an attachment to Form 4400-122.

Page **2** of **4**

Sample		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					RQD/ Comments				
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200					
SS	16	4 6	21.0 22.5 24.0	NOTE: Occasional clayey sand (SC) layers throughout sample 9. FAT CLAY (CH), brown to reddish brown, moist, high plasticity, mottled, with sand (Residuum) <i>(continued)</i>	CH													
10 SS	18 18	2 4 9	25.5 27.0 28.5															
11 SS	18 16	9 8 4	30.0 31.5 33.0															
12 SS	18 14	2 1 1	34.5 36.0 37.5															
13 SS	16 12	38 17 50	39.0 40.5 42.0 43.5											WEATHERED SANDSTONE, light brown fine grained, moderately cemented, highly to completely weathered (Saprolite).				
14 SS	14 16	10 15 50	45.0 46.5 48.0	NOTE: poorly cemented with occasional silt layers throughout sample 14.														
15 SS	13 12	15 45 50	49.5 51.0 52.5															

Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
16 SS	 18 14	32 27 24	54.0 55.5	WEATHERED SANDSTONE, light brown fine grained, moderately cemented, highly to completely weathered (Saprolite). <i>(continued)</i>										
			57.0											
			58.5											
			60.0											
			61.5											
			63.0											
			64.5											
17 SS	 18 14	6 5 10	64.5 66.0											
			67.5											
			69.0											
18 SS	 2 1	50	69.0											
			70.5											
			72.0											
			73.5											
			75.0											
			76.5											
			78.0											
			79.5											
			81.0											
			82.5											
			84.0											
			85.5											
				SANDY DOLOSTONE, light brown, moderately weathered to fresh.										
				NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 84.2 feet bgs on 9/28/2022.										

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Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

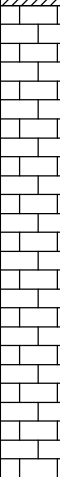
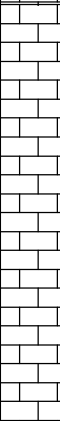
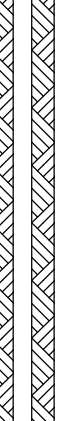
Page 1 of 4

Facility/Project Name Vernon County Landfill Expansion			License/Permit/Monitoring Number 3268		Boring Number MW-16	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec			Date Drilling Started 8/22/2022		Date Drilling Completed 8/26/2022	
Drilling Method hsa,mud rotary						
WI Unique Well No. WC337	DNR Well ID No. 131	Common Well Name MW-16	Final Static Water Level 1,103.9 Feet MSL	Surface Elevation 1,184.3 Feet MSL	Borehole Diameter 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 ☐ S ☐ W	
Facility ID 3268		County Vernon	County Code 63	Civil Town/City/ or Village Viroqua		

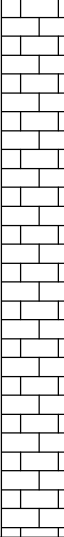
Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 CU	24 -		1.5	LEAN CLAY WITH SAND (CL), brown, moist, low plasticity, occasional fine roots (Fill)	CL									
2 SS	18 0	2 2 2	3.0											
3 SS	18 10	1 1 2	4.5 6.0											
4 ST	24 -		7.5								43	21		
5 ST	24 -		9.0 10.5	LEAN CLAY WITH SAND (CL), brown to light brown, moist, low to medium plasticity, mottled (Residium) NOTE: Trace gravel below 15 feet bgs.	CL					24	37	16	96	0% Gravel, 4% Sand, Permeability = 3.1E-08 cm/sec
6 SS	18 14	2 3 3	12.0 13.5											
7 SS	18 14	8 7 6	15.0 16.5											
8 SS	18 18	4 4 6	18.0											
9	18	4	19.5		CL									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm Short Elliott Hendrickson Inc.	Tel: Fax:
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Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
9 SS	18	5 6	21.0 22.5 24.0	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)	CL								0% Gravel, 62% Sand	
10 SS	18 14	4 4 5	25.5 27.0 28.5	NOTE: Occasional weathered sandstone layering at 25 to 26 feet bgs.										
11 SS	18 8	8 7 5	30.0 31.5 33.0	NOTE: Sample 11 - All Sluff.										
12 SS	18 8	22 28 30	34.5 36.0 37.5	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, with sand layers throughout (Saprolite) NOTE: Sample 12 - All Sluff.										
13 MC	18 -	6 15 42	40.5 42.0 43.5											
14 SS	18 16	5 8 16	45.0 46.5 48.0	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, little gravel, with sand layers throughout (Saprolite)										
15 SS	18 16	8 10 26	49.5 51.0 52.5	NOTE: Switched to mud rotary after sample 15.										

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
16 SS	5 4	50	54.0 55.5 57.0 58.5	WEATHERED SANDY DOLOSTONE, brown to light brown, moist, highly weathered, little gravel, with sand layers throughout (Saprolite) (<i>continued</i>)										
17 SS	9 8	15 50	60.0 61.5 63.0											
18 SS	18 18	35 8 3	64.5 66.0 67.5 69.0	WEATHERED SHALE, brown, moist, highly to completely weathered, little gravel (Saprolite)										
19 SS	3 3	50	70.5 72.0 73.5	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.										
20 SS	18 18	3 9 25	75.0 76.5 78.0	NOTE: 6" layer of weathered shale at 75 feet bgs.										
21 SS	1 1	50	79.5 81.0 82.5 84.0	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.										
22 SS	1 1	50	85.5											

Boring Number		MW-16		Use only as an attachment to Form 4400-122.										Page 4 of 4	
Sample		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					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
23 SS	4 2	50	87.0	SANDY DOLOSTONE, brown to light brown, moist, fresh to moderately weathered (continued)											
			88.5												
			90.0												
			91.5												
			93.0												
24 SS	1 1	50	94.5	Boring Terminated at 98 feet.											
			96.0												
			97.5												

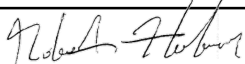
Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 3

Facility/Project Name Vernon County Landfill Expansion			License/Permit/Monitoring Number 3268		Boring Number MW-16WT	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec			Date Drilling Started 9/20/2022		Date Drilling Completed 9/21/2022	
Drilling Method hsa,mud rotary						
WI Unique Well No. WC336	DNR Well ID No. 129	Common Well Name MW-16WT	Final Static Water Level 1,116.3 Feet MSL	Surface Elevation 1,184.7 Feet MSL	Borehole Diameter 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 ☐ S ☐ W	
Facility ID 3268		County Vernon	County Code 63	Civil Town/City/ or Village Viroqua		

Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1.5 3.0 4.5 6.0 7.5 9.0 10.5 12.0 13.5 15.0 16.5 18.0 19.5	See MW-16 for description.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm Short Elliott Hendrickson Inc.	Tel: Fax:
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Page 2 of 3

Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			21.0	See MW-16 for description. <i>(continued)</i>										
			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											

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Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Page 1 of 4

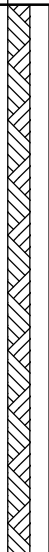
Facility/Project Name Vernon County Landfill Expansion			License/Permit/Monitoring Number 3268		Boring Number MW-17WT	
Boring Drilled By: Name of crew chief (first, last) and Firm Braun Intertec			Date Drilling Started 9/21/2022		Date Drilling Completed 9/23/2022	
Drilling Method hsa, mud rotary						
WI Unique Well No. WC338	DNR Well ID No. 133	Common Well Name MW-17WT	Final Static Water Level 1,116.5 Feet MSL	Surface Elevation 1,196.4 Feet MSL	Borehole Diameter 6.0 inches	
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒ State Plane 163,691 N, 715,688 E S/C/N			Lat ° ' " Long ° ' "		Local Grid Location ☐ N ☐ E ☐ S ☐ W	
SW 1/4 of SE 1/4 of Section 15, T 13 N, R 4 W						
Facility ID 3268		County Vernon	County Code 63	Civil Town/City/ or Village Viroqua		

Sample 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	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 AU	18			LEAN CLAY WITH SAND (CL), brown (Residuum)	CL									
2 SS	18	5	1.5	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).	SC									
3 SS	18	9	3.0											
4 SS	18	6	4.5											
5 SS	18	10	6.0	WEATHERED SANDSTONE, light brown, very friable, iron oxide staining (Saprolite).										
6 SS	18	28	7.5											
7 SS	18	20	9.0											
8 SS	18	14	10.5											
9 SS	18	10	12.0											
10 SS	18	10	13.5											
11 SS	18	14	15.0											
12 SS	18	14	16.5											
13 SS	18	25	18.0											
14 SS	18	24	19.5											
15 SS	18	40												

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature <i>Ben Korte</i>	Firm Short Elliott Hendrickson Inc.	Tel: Fax:
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Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
16 SS	 18 18	10 14 16	54.0 55.5 57.0 58.5	WEATHERED SANDSTONE, brown to dark brown, clayey, very friable (Saprolite). <i>(continued)</i>										
17 SS	 18 8	14 10 10	60.0 61.5 63.0											
18 SS	 18 1	50+	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											
				SANDSTONE, brown to dark brown, clayey, very friable.										
				NOTE: Static water level could not be directly observed during drilling. Groundwater encountered at 79.9 feet bgs on 9/26/2022.										

Page 4 of 4[illegible]

Attachment B

2022 Abandonment Forms

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Page 1 of 2

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.

☒ **Verification Only of Fill and Seal**

Route to DNR Bureau:

☐ Drinking Water ☐ Watershed/Wastewater ☐ Remediation/Redevelopment
☒ Waste Management ☐ Other: _____

1. Well Location Information

County
Vernon

WI Unique Well # of
Removed Well
B-18

Hicap #
NA

Latitude / Longitude (see instructions)
164513 N
715479 W

Format Code
☒ DD
☐ DDM

Method Code
☐ GPS008
☐ SCR002
☐ OTH001

1/4 1/4 1/4
or Gov't Lot #

Section
Township
N

Range
☐ E
☐ W

Well Street Address
NA

Well City, Village or Town
NA

Subdivision Name
NA

Reason for Removal from Service
NA

WI Unique Well # of Replacement Well
NA

3. Filled & Sealed Well / Drillhole / Borehole Information

☐ Monitoring Well
☐ Water Well
☒ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy)
09/19/2022

If a Well Construction Report is available,
please attach.

Construction Type:

☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:

☒ Unconsolidated Formation ☒ Bedrock

Total Well Depth From Ground Surface (ft.)
31

Casing Diameter (in.)
NA

Lower Drillhole Diameter (in.)
3.25

Casing Depth (ft.)
NA

Was well annular space grouted? ☒ Yes ☐ No ☐ Unknown

If yes, to what depth (feet)?
31

Depth to Water (feet)
NA

5. Material Used to Fill Well / Drillhole

Bentonite Chips

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
Viroqua

State
WI

ZIP Code
54665

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed? ☐ Yes ☐ No ☒ N/A

Liner(s) removed? ☐ Yes ☐ No ☒ N/A

Liner(s) perforated? ☐ Yes ☐ No ☒ N/A

Screen removed? ☐ Yes ☐ No ☒ N/A

Casing left in place? ☐ Yes ☐ No ☒ N/A

Was casing cut off below surface? ☐ Yes ☐ No ☒ N/A

Did sealing material rise to surface? ☐ Yes ☐ No ☒ N/A

Did material settle after 24 hours? ☐ Yes ☒ No ☐ N/A

If yes, was hole retopped? ☐ Yes ☐ No ☒ N/A

If bentonite chips were used, were they hydrated with water from a known safe source? ☒ Yes ☐ No ☐ N/A

Required Method of Placing Sealing Material

☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☒ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials

☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☒ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:

☒ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing
Braun Intertec

License #

Date of Filling & Sealing or Verification
(mm/dd/yyyy) 09/19/2022

DNR Use Only

Date Received

Noted By

Street or Route
2309 Palace Street

Telephone Number
(608) 781-1277

Comments

City
La Crosse

State
WI

ZIP Code
54603

Signature of Person Doing Work

Date Signed

5/11/23

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Page 1 of 2

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.

☒ Verification Only of Fill and Seal

Route to DNR Bureau:

- ☐ Drinking Water ☐ Watershed/Wastewater ☐ Remediation/Redevelopment
☒ Waste Management ☐ Other: _____

1. Well Location Information

County Vernon	WI Unique Well # of Removed Well B-19	Hicap # NA
Latitude / Longitude (see instructions) 164380 N 715477 W	Format Code ☒ DD ☐ DDM	Method Code ☐ GPS008 ☐ SCR002 ☐ OTH001
1/4 / 1/4 or Gov't Lot #	Section	Township N
Well Street Address NA		Range ☐ E ☐ W
Well City, Village or Town NA		Well ZIP Code NA
Subdivision Name NA		Lot # NA
Reason for Removal from Service NA	WI Unique Well # of Replacement Well NA	

3. Filled & Sealed Well / Drillhole / Borehole Information

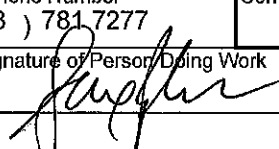
☐ Monitoring Well ☐ Water Well ☒ Borehole / Drillhole	Original Construction Date (mm/dd/yyyy) 09/19/2022
If a Well Construction Report is available, please attach.	
Construction Type: ☒ Drilled ☐ Driven (Sandpoint) ☐ Dug ☐ Other (specify): _____	
Formation Type: ☒ Unconsolidated Formation ☒ Bedrock	
Total Well Depth From Ground Surface (ft.) 31	Casing Diameter (in.) NA
Lower Drillhole Diameter (in.) 3.25	Casing Depth (ft.) NA
Was well annular space grouted? ☒ Yes ☐ No ☐ Unknown	
If yes, to what depth (feet)? 31	Depth to Water (feet) NA

5. Material Used to Fill Well / Drillhole

From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Surface	31	Unk.	NA
Bentonite Chips			

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing Braun Intertec	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy) 09/19/2022	DNR Use Only	
Street or Route 2309 Palace Street		Telephone Number (608) 781-7277	Date Received	Noted By
City La Crosse	State WI	ZIP Code 54603	Signature of Person Doing Work 	
			Date Signed 9/11/23	

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Page 1 of 2

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.

☒ **Verification Only of Fill and Seal**

Route to DNR Bureau:

☐ Drinking Water ☐ Watershed/Wastewater ☐ Remediation/Redevelopment
☒ Waste Management ☐ Other: _____

1. Well Location Information

County Vernon	WI Unique Well # of Removed Well B-20	Hicap # NA
Latitude / Longitude (see instructions) 164064 715518	Format Code ☒ DD ☐ DDM	Method Code ☐ GPS008 ☐ SCR002 ☐ OTH001
$\frac{1}{4}$ / $\frac{1}{4}$ or Gov't Lot #	Section N	Township N
Well Street Address NA		
Well City, Village or Town NA		
Well ZIP Code NA		
Subdivision Name NA		
Reason for Removal from Service NA		
WI Unique Well # of Replacement Well NA		

3. Filled & Sealed Well / Drillhole / Borehole Information

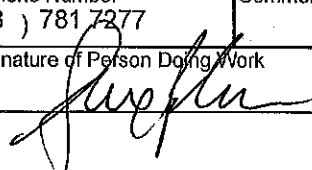
☐ Monitoring Well ☐ Water Well ☒ Borehole / Drillhole	Original Construction Date (mm/dd/yyyy) 09/19/2022
If a Well Construction Report is available, please attach.	
Construction Type: ☒ Drilled ☐ Driven (Sandpoint) ☐ Dug ☐ Other (specify): _____	
Formation Type: ☒ Unconsolidated Formation ☒ Bedrock	
Total Well Depth From Ground Surface (ft.) 31	Casing Diameter (in.) NA
Lower Drillhole Diameter (in.) 3.25	Casing Depth (ft.) NA
Was well annular space grouted? ☒ Yes ☐ No ☐ Unknown	
If yes, to what depth (feet)? 31	Depth to Water (feet) NA

5. Material Used to Fill Well / Drillhole

From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Surface	31	Unk.	NA

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing Braun Intertec	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy) 09/19/2022	DNR Use Only	
			Date Received	Noted By
Street or Route 2309 Palace Street			Comments	
Telephone Number (608) 781-7277				
City La Crosse	State WI	ZIP Code 54603	Signature of Person Doing Work 	Date Signed 5/11/23

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Page 1 of 2

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.

☒ Verification Only of Fill and Seal

Route to DNR Bureau:

- ☐ Drinking Water ☐ Watershed/Wastewater ☐ Remediation/Redevelopment
☒ Waste Management ☐ Other: _____

1. Well Location Information

County Vernon	WI Unique Well # of Removed Well B-21	Hicap # NA
Latitude / Longitude (see instructions) 163857 715398	Format Code ☒ DD ☐ DDM	Method Code ☐ GPS008 ☐ SCR002 ☐ OTH001
1/4 / 1/4 or Gov't Lot #	Section N	Township N
Well Street Address NA	Well City, Village or Town NA	Well ZIP Code NA
Subdivision Name NA	Lot # NA	City of Present Owner Viroqua
Reason for Removal from Service NA	WI Unique Well # of Replacement Well NA	State WI

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 Viroqua
State WI
ZIP Code 54665

3. Filled & Sealed Well / Drillhole / Borehole Information

☐ Monitoring Well	Original Construction Date (mm/dd/yyyy) 09/19/2022
☐ Water Well	If a Well Construction Report is available, please attach.
☒ Borehole / Drillhole	
Construction Type:	
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug	
☐ Other (specify): _____	
Formation Type:	
☒ Unconsolidated Formation ☒ Bedrock	
Total Well Depth From Ground Surface (ft.) 31	Casing Diameter (in.) NA
Lower Drillhole Diameter (in.) 3.25	Casing Depth (ft.) NA
Was well annular space grouted? ☒ Yes ☐ No ☐ Unknown	
If yes, to what depth (feet)? 31	Depth to Water (feet) NA

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes ☐ No ☒ N/A
Liner(s) removed?	☐ Yes ☐ No ☒ N/A
Liner(s) perforated?	☐ Yes ☐ No ☒ N/A
Screen removed?	☐ Yes ☐ No ☒ N/A
Casing left in place?	☐ Yes ☐ No ☒ N/A
Was casing cut off below surface?	☐ Yes ☐ No ☒ N/A
Did sealing material rise to surface?	☐ Yes ☐ No ☒ N/A
Did material settle after 24 hours?	☐ Yes ☒ No ☐ N/A
If yes, was hole retopped?	☐ Yes ☐ No ☒ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☒ Yes ☐ No ☐ N/A
Required Method of Placing Sealing Material	
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped	
☒ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____	

Sealing Materials	
☐ Neat Cement Grout ☐ Concrete	
☐ Sand-Cement (Concrete) Grout ☒ Bentonite Chips	
For Monitoring Wells and Monitoring Well Boreholes Only:	
☒ 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
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)		DNR Use Only	
Braun Intertec					09/19/2022		Date Received	
Street or Route			Telephone Number		Comments			
2309 Palace Street			(608) 781 7277					
City			State		ZIP Code		Signature of Person Doing Work	
La Crosse			WI		54603		Date Signed	
							5/11/23	

Attachment C

2022 Well Construction Logs

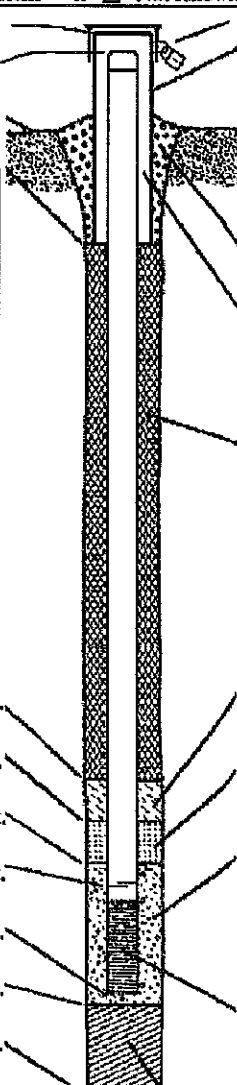
Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

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. 715687 ft. ☒ E.		Well Name MW-14WT	
Facility License, Permit or Monitoring No.		Local Grid Origin ☐ (estimated: ☐) or Well Location ☐		Wis. Unique Well No. DNR Well ID No.	
Facility ID		Lat. _____ Long. _____		Date Well Installed 09/20/2022	
Type of Well Well Code 11 / MW		St. Plane _____ ft. N. _____ ft. E. S/C/N		Well Installed By: Name (first, last) and Firm Ethan Rislov Braun Intertec	
Distance from Waste/ Source _____ ft.		Section Location of Waste/Source 1/4 of _____ 1/4 of Sec. _____ T. _____ N. R. ☒ E. ☒ W.		Gov. Lot Number	
Enf. Stds. Apply ☐		Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known			

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



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 ☐
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
Other ☐
b. Manufacturer NA
c. Slot size: 0010 in.
d. Slotted length: 0015 ft.
11. Backfill material (below filter pack): None ☒ 14
Other ☐

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.

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature *Ethan Rislov* Firm *Braun Intertec*

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	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. _____ Long. _____	Well Name MW-15WT
Facility License, Permit or Monitoring No.	St. Plane _____ ft. N. _____ ft. E. S/C/N _____	Section Location of Waste/Source 1/4 of _____ 1/4 of Sec. _____ T. _____ N. R. _____	Wis. Unique Well No. DNR Well ID No. WC 3 3 5
Facility ID	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number	Date Well Installed 0 9 / 2 0 / 2 0 2 2 m m d d y y y y
Type of Well Well Code 11 / MW	Distance from Waste/Source _____ ft.	Enf. Stds. Apply ☐	Well Installed By: Name (first, last) and Firm Ethan Rislov Braun Interlec

A. Protective pipe, top elevation 1 2 2 3 3 8 ft. MSL	1. Cap and lock? ☒ Yes ☐ No
B. Well casing, top elevation 1 2 2 3 2 4 ft. MSL	2. Protective cover pipe: a. Inside diameter: 0 0 6 in. b. Length: 0 0 5 ft. c. Material: Steel ☒ 0 4 Other ☐
C. Land surface elevation 1 2 2 0 6 1 ft. MSL	d. Additional protection? ☒ Yes ☐ No If yes, describe: Bumper Posts
D. Surface seal, bottom 1 2 1 8 ft. MSL or 2 ft.	3. Surface seal: Bentonite ☐ 3 0 Concrete ☒ 0 1 Other ☐
12. USCS classification of soil near screen: GP ☐ GM ☐ GC ☐ GW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☒	4. Material between well casing and protective pipe: Bentonite ☒ 3 0 Other ☐
13. Sieve analysis performed? ☐ Yes ☒ No	5. Annular space seal: a. Granular/Chipped Bentonite ☐ 3 3 b. _____ Lbs/gal mud weight _____ Bentonite-sand slurry ☐ 3 5 c. _____ Lbs/gal mud weight _____ Bentonite slurry ☐ 3 1 d. 20 % Bentonite _____ Bentonite-cement grout ☒ 5 0 e. _____ Ft ³ volume added for any of the above f. How installed: Tremie ☒ 0 1 Tremie pumped ☐ 0 2 Gravity ☐ 0 8
14. Drilling method used: Rotary ☐ 5 0 Hollow Stem Auger ☒ 4 1 Other ☐	6. Bentonite seal: a. Bentonite granules ☐ 3 3 b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 3 2 c. NA Other ☐
15. Drilling fluid used: Water ☐ 0 2 Air ☐ 0 1 Drilling Mud ☒ 0 3 None ☐ 9 9	7. Fine sand material: Manufacturer, product name & mesh size a. #15 sand b. Volume added 1 ft ³
16. Drilling additives used? ☐ Yes ☒ No	8. Filter pack material: Manufacturer, product name & mesh size a. #40 sand b. Volume added 4.5 ft ³
Describe _____	9. Well casing: Flush threaded PVC schedule 40 ☒ 2 3 Flush threaded PVC schedule 80 ☐ 2 4 Other ☐
17. Source of water (attach analysis, if required): City of Viroqua Municipal	10. Screen material: PVC a. Screen type: Factory cut ☒ 1 1 Continuous slot ☐ 0 1 Other ☐
E. Bentonite seal, top _____ ft. MSL or 68 ft.	b. Manufacturer NA c. Slot size: 0 0 1 0 in. d. Slotted length: 0 0 1 0 ft.
F. Fine sand, top _____ ft. MSL or 69 ft.	11. Backfill material (below filter pack): None ☒ 1 4 Other ☐
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 0 0 0 6 in.	
M. O.D. well casing 2 3 7 5 in.	
N. I.D. well casing 2 0 4 7 in.	

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Ethan Rislov Firm Braun Interlec

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.

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. 715674 ft. ☒ E.		Well Name MVV-16WT	
Facility License, Permit or Monitoring No.		Local Grid Origin ☐ (estimated: ☐) or Well Location ☐		Wis. Unique Well No. ☐ DNR Well ID No. ☐	
Facility ID		Lat. _____ Long. _____ or _____		Date Well Installed 09/20/2022	
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 ☐		Gov. Lot Number	
		Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known			

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 ☒

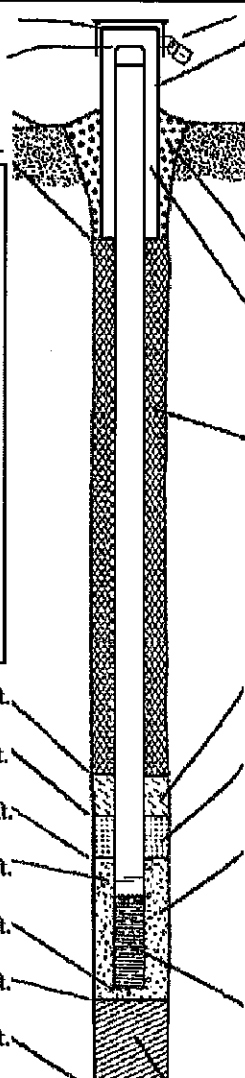
13. Sieve analysis performed? ☐ Yes ☒ No

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



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 ☐

4. Material between well casing and protective pipe: Bentonite ☒ 30
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. _____ 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 2 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 ☐

b. Manufacturer NA
c. Slot size: 0010 in.
d. Slotted length: 0005 ft.

11. Backfill material (below filter pack): None ☒ 14
Other ☐

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.

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [Signature] Firm Braun Intertec

Facility/Project Name Vernon County Solid Waste Facility		Local Grid Location of Well 163930 ft. ☒ N. 715670 ft. ☒ E. ☐ S. ☐ 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. W C 3 3 7 DNR Well ID No. _____	
Facility ID _____		St. Plane _____ ft. N. _____ ft. E. S/C/N		Date Well Installed 0 9 / 2 0 / 2 0 2 2 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	
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 _____		Gov. Lot Number _____		Braun Intertec	

A. Protective pipe, top elevation 1 1 8 6 . 9 5 ft. MSL

B. Well casing, top elevation 1 1 8 6 . 9 2 ft. MSL

C. Land surface elevation 1 1 8 4 . 2 7 ft. MSL

D. Surface seal, bottom 1 1 8 2 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 ☒ 5 0
 Hollow Stem Auger ☒ 4 1
 Other ☐

15. Drilling fluid used: Water ☒ 0 2 Air ☐ 0 1
 Drilling Mud ☒ 0 3 None ☐ 9 9

16. Drilling additives used? ☐ Yes ☒ No

Describe _____

17. Source of water (attach analysis, if required):
 City of Viroqua Municipal

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
 a. Inside diameter: 0 0 6 in.
 b. Length: 0 0 5 ft.
 c. Material: Steel ☒ 0 4
 Other ☐
 d. Additional protection? ☒ Yes ☐ No
 If yes, describe: Bumper Posts

3. Surface seal: Bentonite ☐ 3 0
 Concrete ☒ 0 1
 Other ☐

4. Material between well casing and protective pipe:
 Bentonite ☒ 3 0
 Other ☐

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 3 3
 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 3 5
 c. _____ Lbs/gal mud weight Bentonite slurry ☐ 3 1
 d. 20 % Bentonite Bentonite-cement grout ☒ 5 0
 e. _____ Ft³ volume added for any of the above
 f. How installed: Tremie ☒ 0 1
 Tremie pumped ☐ 0 2
 Gravity ☐ 0 8

6. Bentonite seal: a. Bentonite granules ☐ 3 3
 b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 3 2
 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 2 ft³

9. Well casing: Flush threaded PVC schedule 40 ☒ 2 3
 Flush threaded PVC schedule 80 ☐ 2 4
 Other ☐

10. Screen material: PVC
 a. Screen type: Factory cut ☒ 1 1
 Continuous slot ☐ 0 1
 Other ☐
 b. Manufacturer NA
 c. Slot size: 0 0 1 0 in.
 d. Slotted length: 0 0 0 5 ft.

11. Backfill material (below filter pack): None ☒ 1 4
 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	
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Braun Intertec

Route 10.

Watershed/Wastewater ☐Remediation/Redevelopment ☐Waste Management ☐Other ☐MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Vernon County Solid Waste Facility		Local Grid Location of Well 103691		Well Name MW-17WT	
Facility License, Permit or Monitoring No.		Local Grid Origin ☐ (estimated: ☐) or Well Location ☐		Wis. Unique Well No. DNR Well ID No. W 0 3 3 8	
Facility ID		St. Plane _____ ft. N. _____ ft. E. S/C/N		Date Well Installed 9 / 2 0 / 2 0 2 2	
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 ☐		Gov. Lot Number	
Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known		Gov. Lot Number			

A. Protective pipe, top elevation	1 1 9 9 . 2 4 ft. MSL	1. Cap and lock?	☒ Yes ☐ No
B. Well casing, top elevation	1 1 9 9 . 1 8 ft. MSL	2. Protective cover pipe:	
C. Land surface elevation	1 1 9 6 . 4 3 ft. MSL	a. Inside diameter:	0 0 6 in.
D. Surface seal, bottom	1 1 9 4 _____ ft. MSL or _____ 2 _____ ft.	b. Length:	0 0 5 ft.
12. USCS classification of soil near screen: GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐ Bedrock ☐		c. Material:	Steel ☒ 0 4 Other ☐
13. Sieve analysis performed? ☐ Yes ☒ No		d. Additional protection?	☒ Yes ☐ No
14. Drilling method used: Rotary ☒ 5 0 Hollow Stem Auger ☒ 4 1 Other ☐		If yes, describe: Bumper Posts	
15. Drilling fluid used: Water ☒ 0 2 Air ☐ 0 1 Drilling Mud ☒ 0 3 None ☐ 9 9		3. Surface seal:	
16. Drilling additives used? ☐ Yes ☒ No		Bentonite ☐ 3 0 Concrete ☒ 0 1 Other ☐	
Describe _____		4. Material between well casing and protective pipe:	
17. Source of water (attach analysis, if required): City of Viroqua Municipal		Bentonite ☒ 3 0 Other ☐	
E. Bentonite seal, top _____ ft. MSL or _____ 68 _____ ft.		5. Annular space seal:	
F. Fine sand, top _____ ft. MSL or _____ 71 _____ ft.		a. Granular/Chipped Bentonite ☐ 3 3 b. _____ Lbs/gal mud weight _____ Bentonite-sand slurry ☐ 3 5 c. _____ Lbs/gal mud weight _____ Bentonite slurry ☐ 3 1 d. 20 % Bentonite _____ Bentonite-cement grout ☒ 5 0 e. _____ Ft ³ volume added for any of the above	
G. Filter pack, top _____ ft. MSL or _____ 75 _____ ft.		f. How installed:	
H. Screen joint, top _____ ft. MSL or _____ 77 _____ ft.		Tremie ☒ 0 1 Tremie pumped ☐ 0 2 Gravity ☐ 0 8	
I. Well bottom _____ ft. MSL or _____ 87 _____ ft.		6. Bentonite seal:	
J. Filter pack, bottom _____ ft. MSL or _____ 92 _____ ft.		a. Bentonite granules ☐ 3 3 b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 3 2 c. _____ NA _____ Other ☐	
K. Borehole, bottom _____ ft. MSL or _____ 93 _____ ft.		7. Fine sand material: Manufacturer, product name & mesh size	
L. Borehole, diameter 0 0 0 6 in.		a. #15 sand	
M. O.D. well casing 2 3 7 5 in.		b. Volume added _____ 1 _____ ft ³	
N. I.D. well casing 2 0 4 7 in.		8. Filter pack material: Manufacturer, product name & mesh size	
		a. #40 sand	
		b. Volume added _____ 4 _____ ft ³	
		9. Well casing:	
		Flush threaded PVC schedule 40 ☒ 2 3 Flush threaded PVC schedule 80 ☐ 2 4 Other ☐	
		10. Screen material: PVC	
		a. Screen type:	
		Factory cut ☒ 1 1 Continuous slot ☐ 0 1 Other ☐	
		b. Manufacturer NA	
		c. Slot size: 0 0 1 0 in.	
		d. Slotted length: 0 0 1 0 ft.	
		11. Backfill material (below filter pack):	
		None ☒ 1 4 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.

Attachment D

2022 Well Development Forms

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name Vernon County Landfill	County Name Vernon	Well Name MW-14WT
Facility License, Permit or Monitoring Number 3268	County Code 62	Wis. Unique Well Number WC334
		DNR Well ID Number 125

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

- surged with bailer and bailed ☐ 4 1
 surged with bailer and pumped ☐ 6 1
 surged with block and bailed ☐ 4 2
 surged with block and pumped ☒ 6 2
 surged with block, bailed and pumped ☐ 7 0
 compressed air ☐ 2 0
 bailed only ☐ 1 0
 pumped only ☐ 5 1
 pumped slowly ☐ 5 0
 Other ☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casing) 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? ☐ Yes ☐ No
(If yes, attach results)

17. Additional comments on development:

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>103.31</u> ft.	<u>103.31</u> ft.
Date	b. <u>11</u> / <u>02</u> / <u>2022</u> m m d d y y y y	<u>11</u> / <u>02</u> / <u>2022</u> m m d d y y y y
Time	c. <u>1</u> : <u>00</u> ☐ a.m. ☒ p.m.	<u>2</u> : <u>00</u> ☐ a.m. ☒ p.m.
12. Sediment in well bottom	<u>0.1</u> inches	<u>0.0</u> inches
13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe) <u>very light brown</u> <u>turbid</u>	Clear ☒ 2 0 Turbid ☐ 2 5 (Describe) <u>clear</u>
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	<u>289.0</u> mg/l	<u>10.0</u> mg/l
15. COD	<u>10.0</u> mg/l	
16. Well developed by: Name (first, last) and Firm		
First Name: <u>Veronica</u> Last Name: <u>Aranda</u>		
Firm: <u>Short Elliott Hendrickson Inc.</u>		

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.

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name Vernon County Landfill	County Name Vernon	Well Name MW-15WT
Facility License, Permit or Monitoring Number 3268	County Code 62	Wis. Unique Well Number WC335
		DNR Well ID Number 127

1. Can this well be purged dry? ☐ Yes ☒ No

DRY WELL

2. Well development method

- surged with bailer and bailed ☐ 4 1
 surged with bailer and pumped ☐ 6 1
 surged with block and bailed ☐ 4 2
 surged with block and pumped ☒ 6 2
 surged with block, bailed and pumped ☐ 7 0
 compressed air ☐ 2 0
 bailed only ☐ 1 0
 pumped only ☐ 5 1
 pumped slowly ☐ 5 0
 Other DRY WELL ☒

3. Time spent developing well 20 min.

4. Depth of well (from top of well casing) 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? ☒ Yes ☐ No
(If yes, attach results)

17. Additional comments on development:

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>85.13</u> ft.	<u>85.53</u> ft.
Date	b. <u>11</u> / <u>02</u> / <u>2022</u> m m d d y y y y	<u>11</u> / <u>02</u> / <u>2022</u> m m d d y y y y
Time	c. <u>10</u> : <u>40</u> ☒ a.m. ☐ p.m.	<u>11</u> : <u>00</u> ☒ a.m. ☐ p.m.
12. Sediment in well bottom	<u> </u> inches	<u> </u> inches
13. Water clarity	Clear ☐ 1 0 Turbid ☐ 1 5 (Describe)	Clear ☐ 2 0 Turbid ☐ 2 5 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	<u> </u> mg/l	<u> </u> mg/l
15. COD	<u> </u> mg/l	<u> </u> mg/l
16. Well developed by: Name (first, last) and Firm		
First Name: <u>Veronica</u> Last Name: <u>Aranda</u>		
Firm: <u>Short Elliott Hendrickson Inc.</u>		

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.

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name Vernon County Landfill	County Name Vernon	Well Name MW-16WT
Facility License, Permit or Monitoring Number 3268	County Code 62	Wis. Unique Well Number WC336
		DNR Well ID Number 129

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

- surged with bailer and bailed ☐ 4 1
 surged with bailer and pumped ☐ 6 1
 surged with block and bailed ☐ 4 2
 surged with block and pumped ☒ 6 2
 surged with block, bailed and pumped ☐ 7 0
 compressed air ☐ 2 0
 bailed only ☐ 1 0
 pumped only ☐ 5 1
 pumped slowly ☐ 5 0
 Other ☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casing) 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? ☐ Yes ☐ No
(If yes, attach results)

17. Additional comments on development:

Purged dry and very slow recharge. Therefore, not enough water to collect a sample.

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>75.70</u> ft.	<u>76.23</u> ft.
Date	b. <u>11</u> / <u>02</u> / <u>2022</u> m m d d y y y y	<u>11</u> / <u>02</u> / <u>2022</u> m m d d y y y y
Time	c. <u>11</u> : <u>30</u> ☒ a.m. ☐ p.m.	<u>12</u> : <u>30</u> ☐ a.m. ☒ p.m.
12. Sediment in well bottom	<u>0.2</u> inches	<u>0.0</u> inches
13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe) <u>light brown</u> <u>sandy/silty</u>	Clear ☐ 2 0 Turbid ☒ 2 5 (Describe) <u>light brown</u>
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	<u> </u> mg/l	<u> </u> mg/l
15. COD	<u> </u> mg/l	<u> </u> mg/l
16. Well developed by: Name (first, last) and Firm		
First Name: <u>Veronica</u>		Last Name: <u>Aranda</u>
Firm: <u>Short Elliott Hendrickson Inc.</u>		

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: 

Print Name: Veronica Aranda

Firm: Short Elliott Hendrickson Inc.

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name Vernon County Landfill	County Name Vernon	Well Name MW-16
Facility License, Permit or Monitoring Number 3268	County Code 62	Wis. Unique Well Number WC337
		DNR Well ID Number 131

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

- surged with bailer and bailed ☐ 4 1
 surged with bailer and pumped ☐ 6 1
 surged with block and bailed ☐ 4 2
 surged with block and pumped ☒ 6 2
 surged with block, bailed and pumped ☐ 7 0
 compressed air ☐ 2 0
 bailed only ☐ 1 0
 pumped only ☐ 5 1
 pumped slowly ☐ 5 0
 Other ☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casing) 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? ☐ Yes ☐ No
(If yes, attach results)

17. Additional comments on development:

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>84.49</u> ft.	<u>84.49</u> ft.
Date	b. <u>11</u> / <u>02</u> / <u>2022</u> m m d d y y y y	<u>11</u> / <u>02</u> / <u>2022</u> m m d d y y y y
Time	c. <u>2</u> : <u>30</u> ☐ a.m. ☒ p.m.	<u>3</u> : <u>30</u> ☐ a.m. ☒ p.m.
12. Sediment in well bottom	<u>0.0</u> inches	<u>0.0</u> inches
13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe) <u>light brown</u> <u>little silt</u>	Clear ☐ 2 0 Turbid ☒ 2 5 (Describe) <u>light brown</u>

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids 273.0 mg/l

15. COD 11.5 mg/l

16. Well developed by: Name (first, last) and Firm

First Name: Veronica Last Name: Aranda

Firm: Short Elliott Hendrickson Inc.

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.

Route to: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name Vernon County Landfill	County Name Vernon	Well Name MW-17WT
Facility License, Permit or Monitoring Number 3268	County Code 62	Wis. Unique Well Number WC338
		DNR Well ID Number 133

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

- surged with bailer and bailed ☐ 4 1
 surged with bailer and pumped ☐ 6 1
 surged with block and bailed ☐ 4 2
 surged with block and pumped ☒ 6 2
 surged with block, bailed and pumped ☐ 7 0
 compressed air ☐ 2 0
 bailed only ☐ 1 0
 pumped only ☐ 5 1
 pumped slowly ☐ 5 0
 Other ☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casing) 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? ☒ Yes ☐ No
(If yes, attach results)

17. Additional comments on development:

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>85.53</u> ft.	<u>84.98</u> ft.
Date	b. <u>11</u> / <u>02</u> / <u>2022</u> m m d d y y y y	<u>11</u> / <u>02</u> / <u>2022</u> m m d d y y y y
Time	c. <u>9</u> : <u>30</u> ☒ a.m. ☐ p.m.	<u>10</u> : <u>30</u> ☒ a.m. ☐ p.m.
12. Sediment in well bottom	<u>0.6</u> inches	<u>1.0</u> inches
13. Water clarity	Clear ☐ 1 0 Turbid ☒ 1 5 (Describe) <u>light brown</u> <u>sandy/silty</u>	Clear ☐ 2 0 Turbid ☒ 2 5 (Describe) <u>light brown</u>
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	<u>58.4</u> mg/l	<u>11.0</u> mg/l
15. COD	<u>11.0</u> mg/l	
16. Well developed by: Name (first, last) and Firm		
First Name: <u>Veronica</u> Last Name: <u>Aranda</u>		
Firm: <u>Short Elliott Hendrickson Inc.</u>		

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.

Attachment E

2022 Geophysics Boring Logs

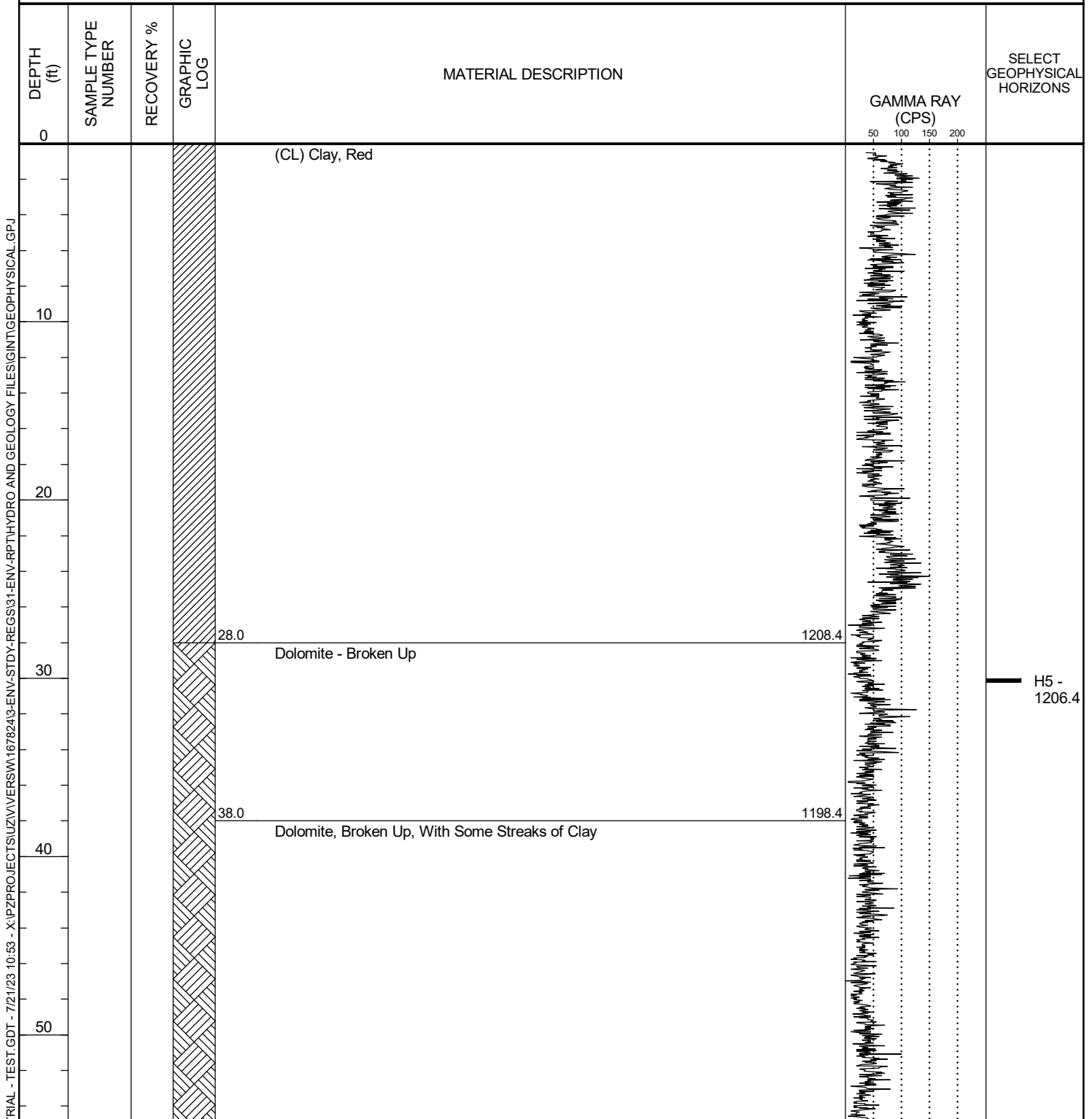


Short Elliott Hendrickson Inc.

BORING NUMBER MW-1

PAGE 1 OF 4

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
DRILLING CONTRACTOR	Ace Well Drilling	GROUND ELEVATION	1236.4 ft
DRILLING METHOD	Air Rotary	HOLE SIZE	6 inches
LOGGED BY	Central Wis. Engineers	CHECKED BY	M. Lindenfelser
NOTES	Geophysical log completed by SEH during November 2022.		
GROUND WATER LEVELS:		AT TIME OF DRILLING ---	
		AT END OF DRILLING ---	
		AFTER DRILLING ---	



(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-1

PAGE 2 OF 4

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 (<i>continued</i>)		H4 - 1176.4
70						
80				80.0 Dolomite, Hard, Crevice From 145' to 148', Set Well at 156.26' 1156.4		H3 - 1156.4
90						
100						
110						H2 - 1120.4

(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-1

PAGE 3 OF 4

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)	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						

(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-1

PAGE 4 OF 4

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)	SELECT GEOPHYSICAL HORIZONS
					50 100 150 200	
190				Dolomite, Hard, Crevice From 145' to 148'; Set Well at 156.26' (<i>continued</i>)		
200				200.0	1036.4	

Bottom of borehole at 200.0 feet.

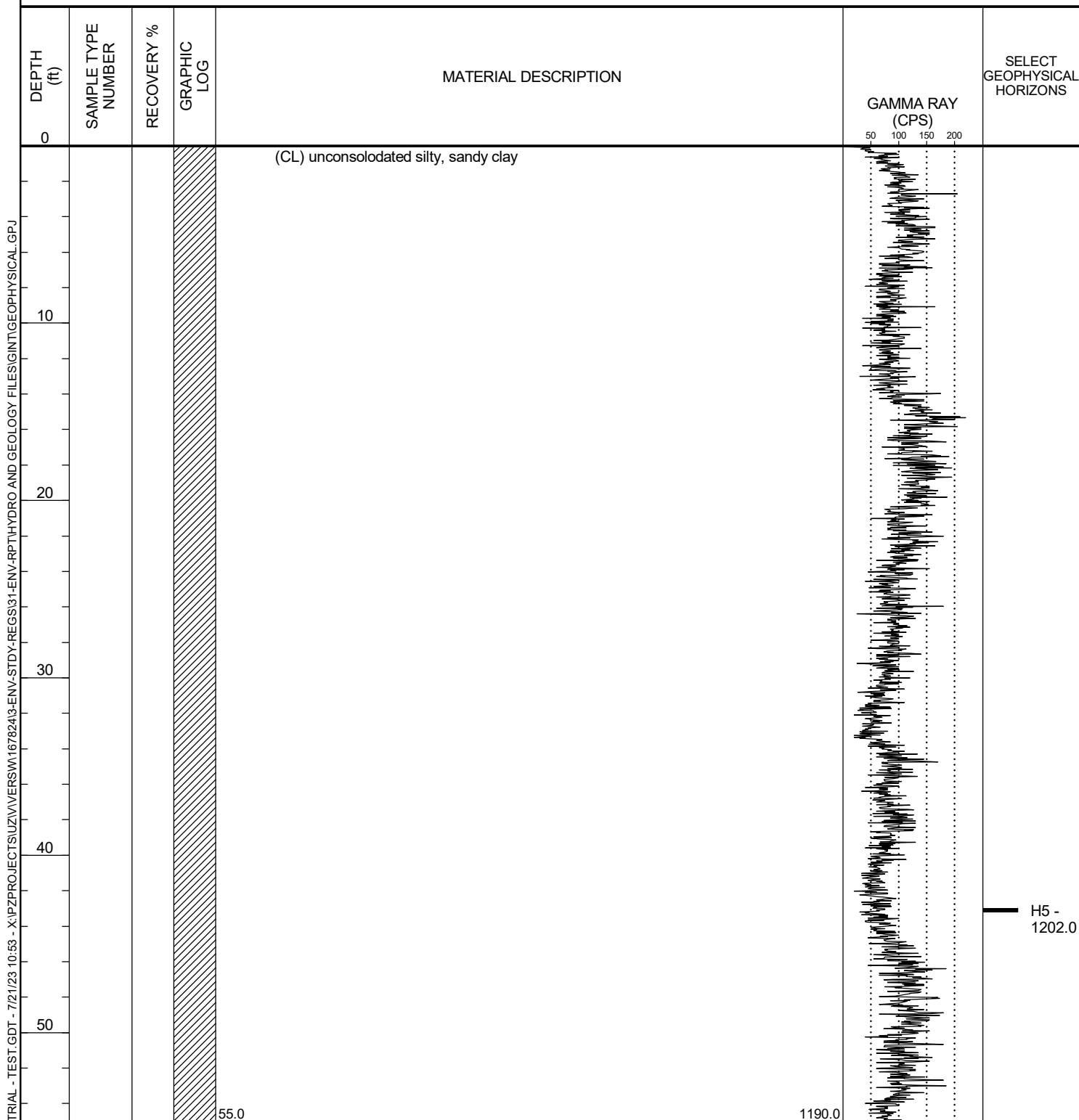


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BORING NUMBER MW-1R

PAGE 1 OF 3

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
DRILLING CONTRACTOR	Ace Well Drilling	GROUND ELEVATION	1245 ft
DRILLING METHOD	Air Rotary	HOLE SIZE	6 inches
LOGGED BY	Central Wis. Engineers	CHECKED BY	M. Lindenfelser
NOTES	Geophysical log completed by SEH during November 2022.		
GROUND WATER LEVELS:		AT TIME OF DRILLING ---	
		AT END OF DRILLING ---	
		AFTER DRILLING ---	



(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-1R

PAGE 2 OF 3

CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZW\VERSW167824\3-ENV-STDY-REGS\31-ENV-RPTHYDRO AND GEOLOGY FILES\GINTGEOPHYSICAL.GPJ

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 partings		
70						
74.0				Light tan dolomite, massive structure	1171.0	H4 - 1173.0
80						
90						H3 - 1155.0
100						
110						

(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-1R

PAGE 3 OF 3

CLIENT Vernon County PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824 PROJECT LOCATION Viroqua, Wisconsin

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZZ\VERSW167824\3-ENV-STDY-REGS\31-ENV-RPTHYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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 (<i>continued</i>)		
130						H2 - 1119.0
140				140.0 Tan, Dolomite, well set @ 162'	1105.0	H1 - 1105.0
150						
160						
166.0				Bottom of borehole at 166.0 feet.	1079.0	

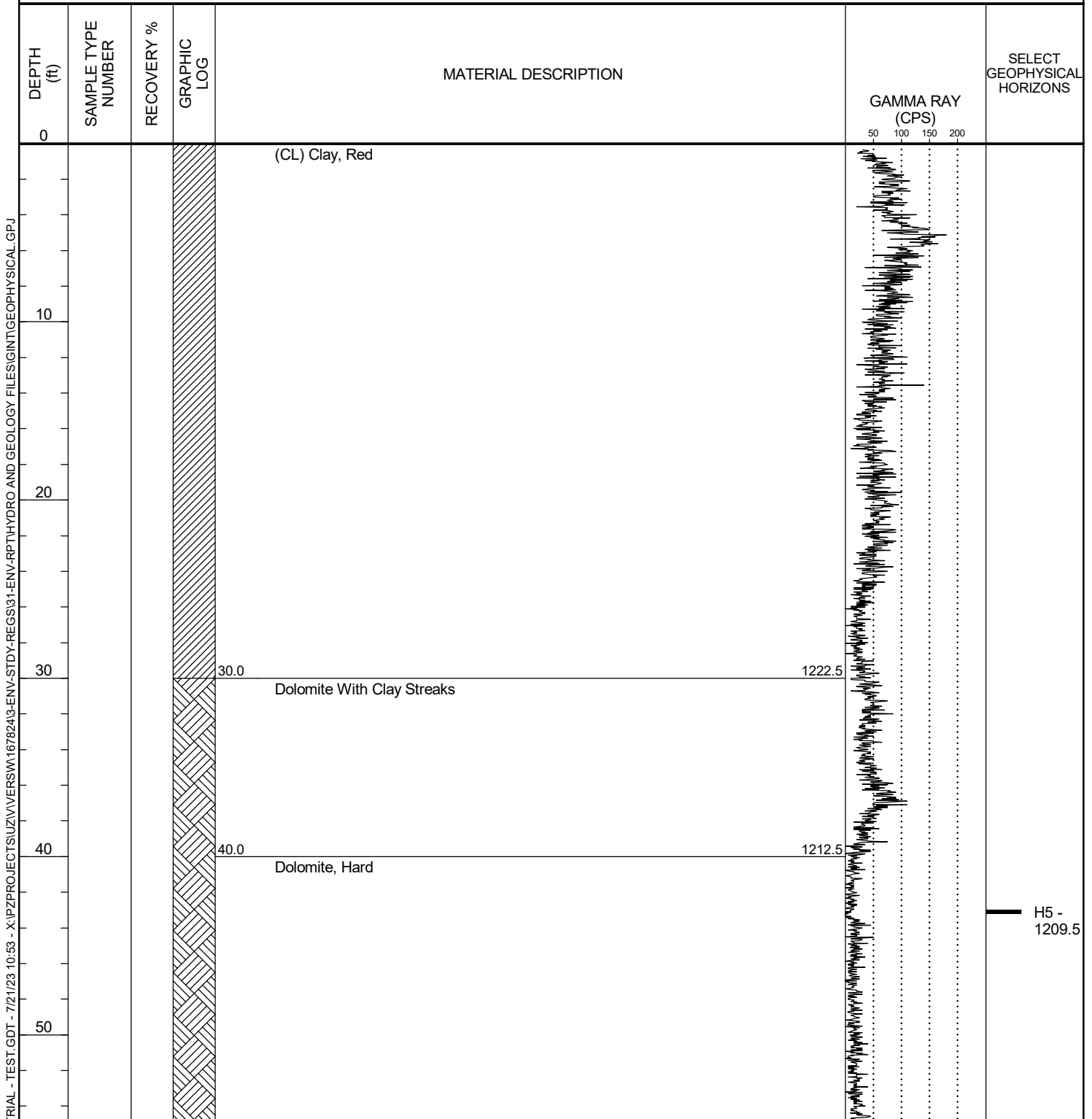


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BORING NUMBER MW-2

PAGE 1 OF 4

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
DRILLING CONTRACTOR	Ace Well Drilling	GROUND ELEVATION	1252.5 ft
DRILLING METHOD	Air Rotary	HOLE SIZE	6 inches
LOGGED BY	Central Wis. Engineers	CHECKED BY	M. Lindenfelser
NOTES	Geophysical log completed by SEH during November 2022.		
GROUND WATER LEVELS:		AT TIME OF DRILLING ---	
		AT END OF DRILLING ---	
		AFTER DRILLING ---	



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BORING NUMBER MW-2

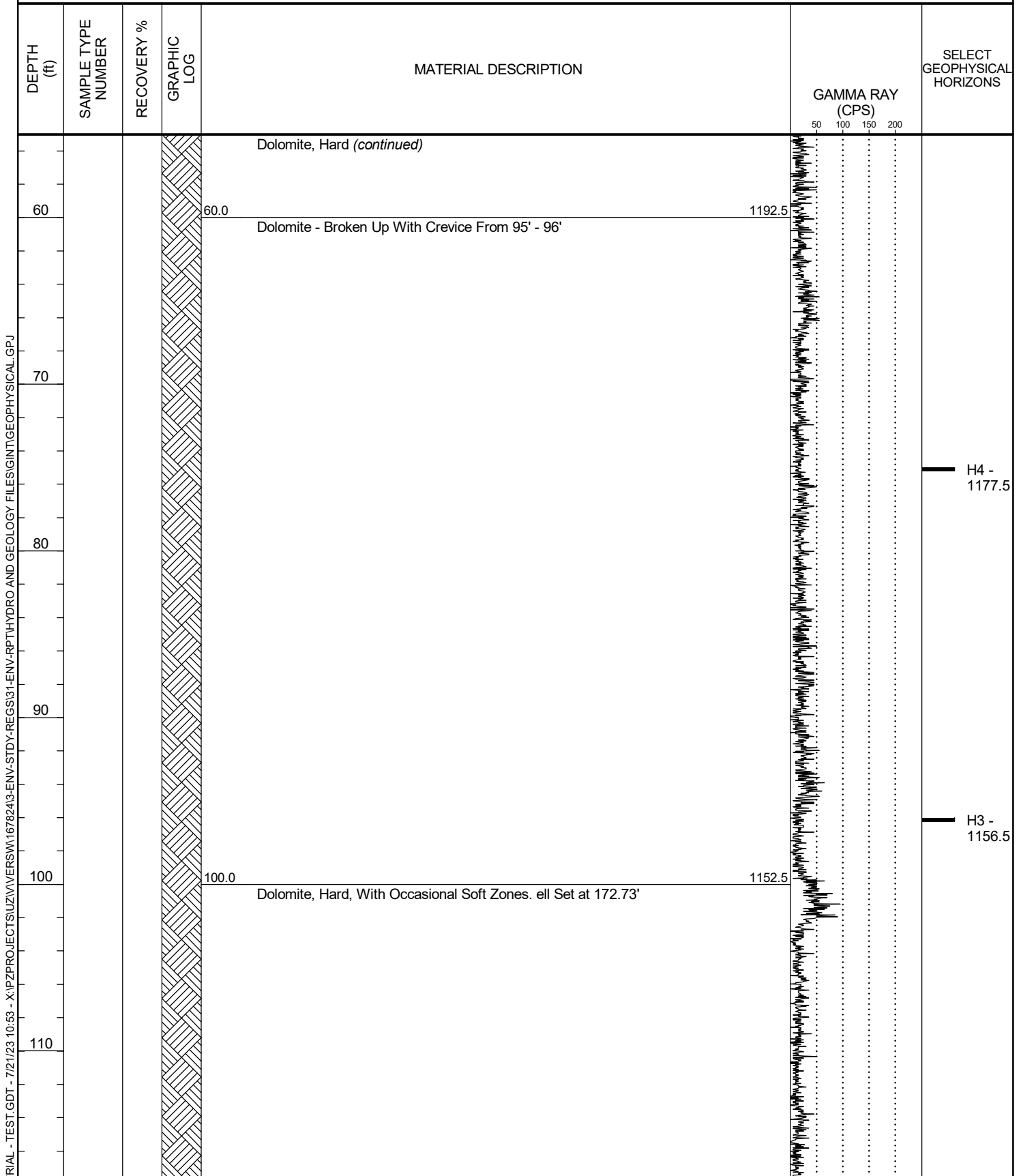
PAGE 2 OF 4

CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin



(Continued Next Page)



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BORING NUMBER MW-2

PAGE 3 OF 4

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						
150						H1 - 1110.5
160						
170						
180						

(Continued Next Page)



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BORING NUMBER MW-2

PAGE 4 OF 4

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)				SELECT GEOPHYSICAL HORIZONS
					50	100	150	200	
190				Dolomite, Hard, With Occasional Soft Zones. ell Set at 172.73' (continued)					
190.0				1062.5					

Bottom of borehole at 190.0 feet.

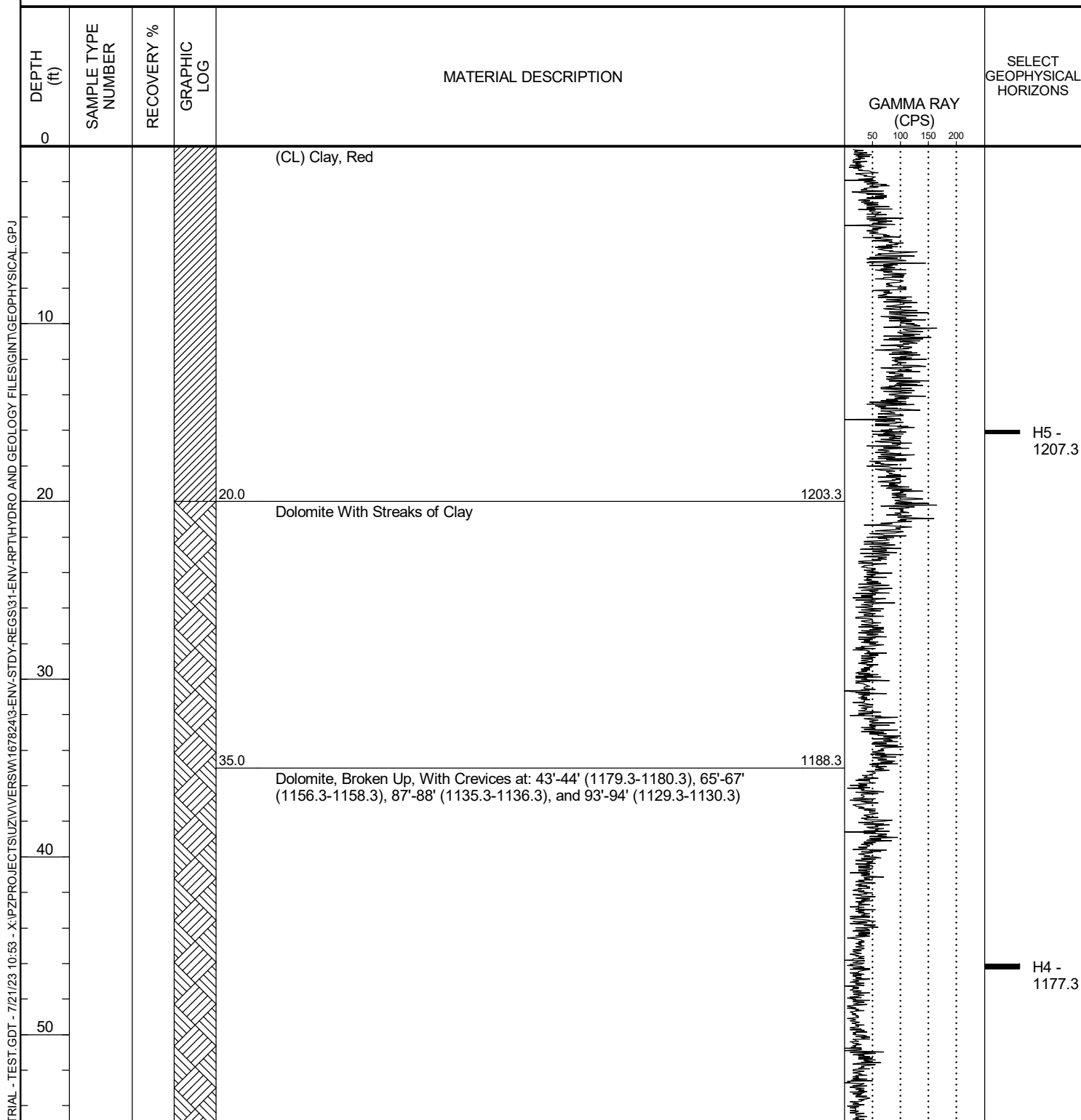


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BORING NUMBER MW-5

PAGE 1 OF 3

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
DRILLING CONTRACTOR	Ace Well Drilling	GROUND ELEVATION	1223.3 ft
DRILLING METHOD	Air Rotary	HOLE SIZE	6 inches
LOGGED BY	Central Wis. Engineers	CHECKED BY	M. Lindenfelser
NOTES	Geophysical log completed by SEH during November 2022.		
GROUND WATER LEVELS:		AT TIME OF DRILLING ---	
		AT END OF DRILLING ---	
		AFTER DRILLING ---	



(Continued Next Page)



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BORING NUMBER MW-5

PAGE 2 OF 3

CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZZ\VERSW167824\3-ENV-STDY-REGS\31-ENV-RPTHYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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 Dolomite, Hard 1121.3		
110						H2 - 1118.3
						H1 - 1107.3

(Continued Next Page)



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BORING NUMBER MW-5

PAGE 3 OF 3

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 (<i>continued</i>)		
130						
140				135.0 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)	1088.3	
150						
160						
170						
180				180.0	1043.3	

Bottom of borehole at 180.0 feet.

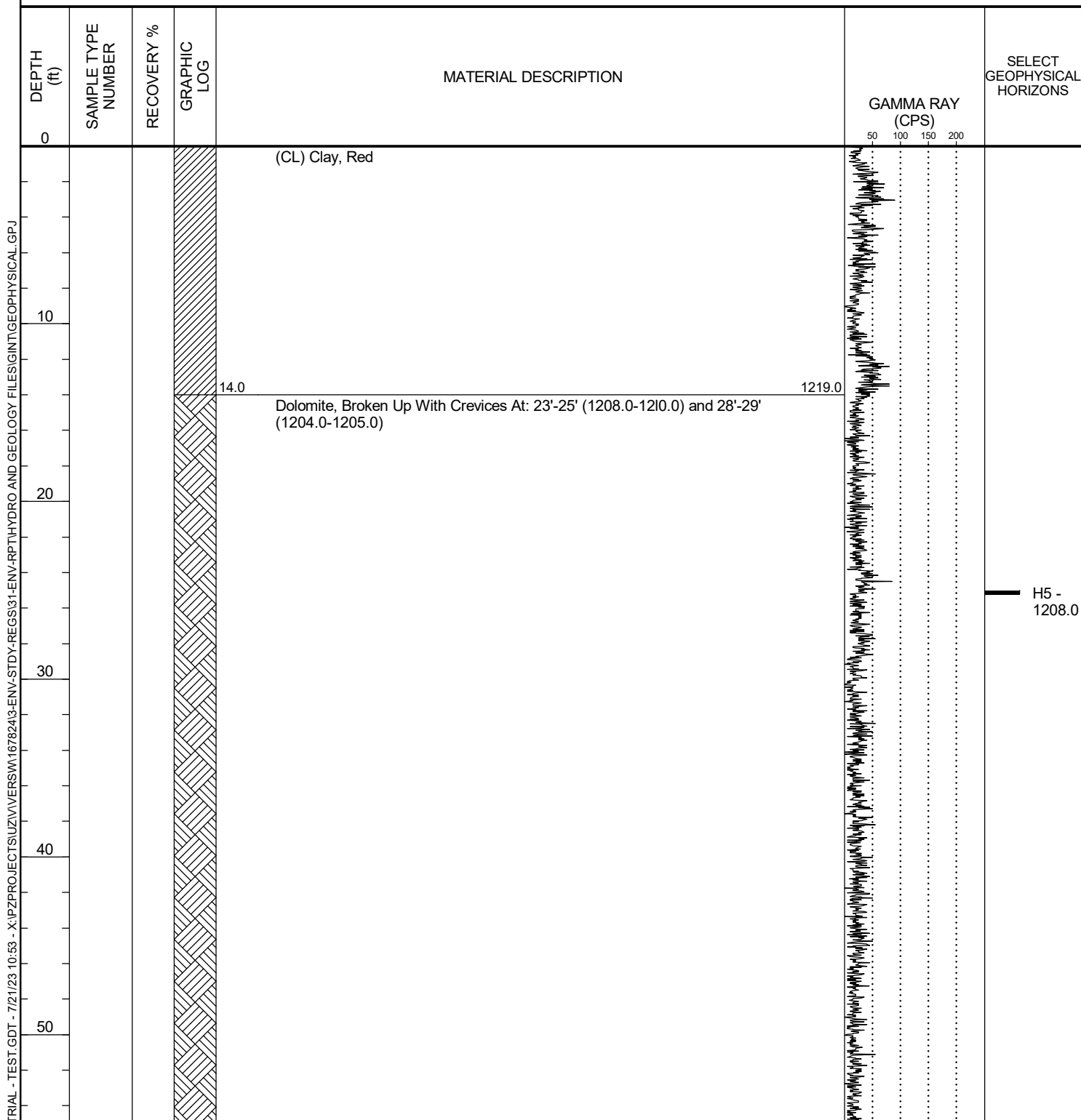


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BORING NUMBER MW-6

PAGE 1 OF 4

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
DRILLING CONTRACTOR	Ace Well Drilling	GROUND ELEVATION	1233 ft
DRILLING METHOD	Air Rotary	HOLE SIZE	6 inches
LOGGED BY	Central Wis. Engineers	CHECKED BY	M. Lindenfelser
NOTES	Geophysical log completed by SEH during November 2022.		
GROUND WATER LEVELS:		AT TIME OF DRILLING ---	
		AT END OF DRILLING ---	
		AFTER DRILLING ---	



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BORING NUMBER MW-6

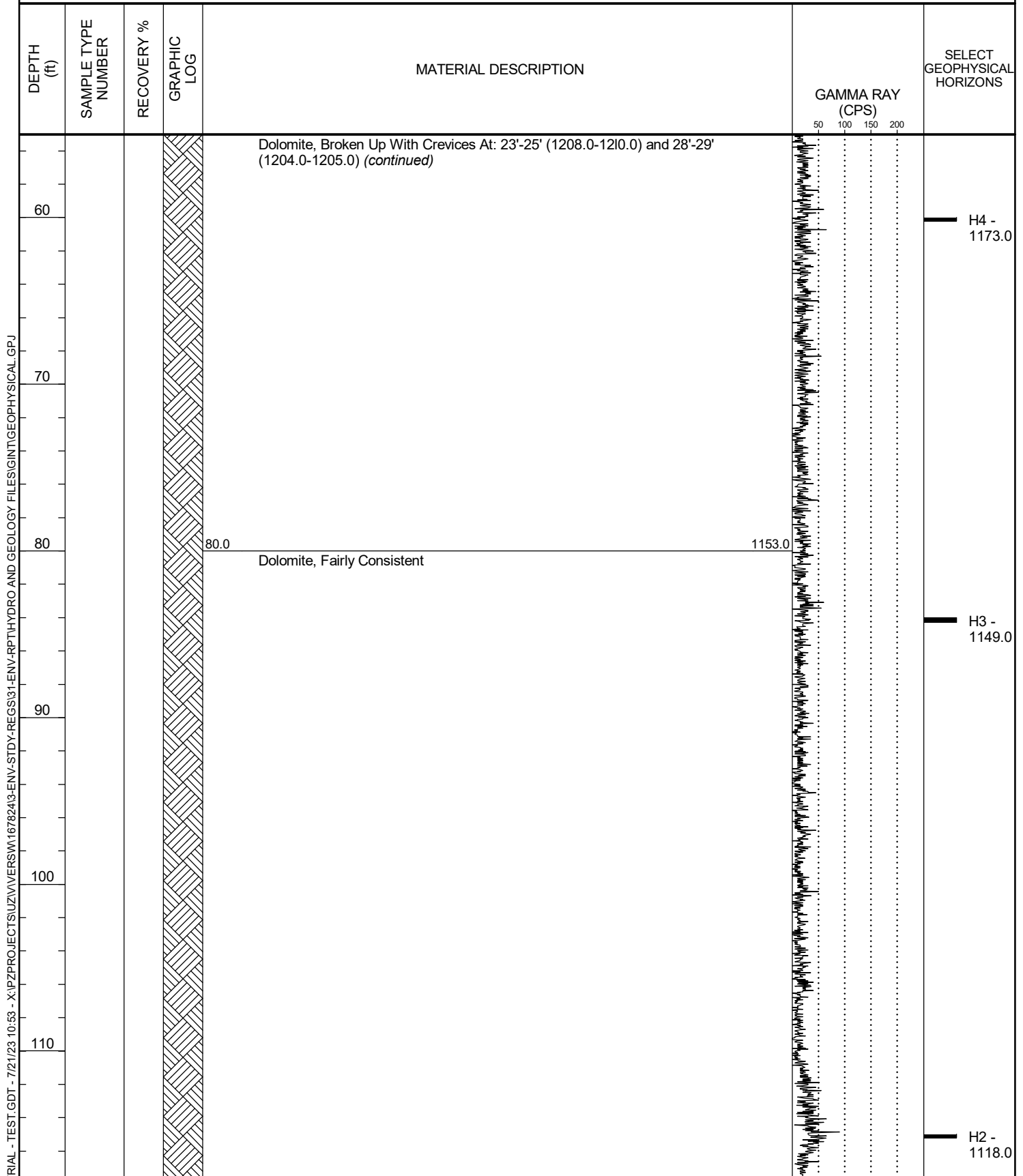
PAGE 2 OF 4

CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin



(Continued Next Page)



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BORING NUMBER MW-6

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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, Fairly Consistent (<i>continued</i>)		
130						
140						
150						
160						
170						
180						
180.0					1053.0	H1 - 1107.0

(Continued Next Page)



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BORING NUMBER MW-6

PAGE 4 OF 4

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)	SELECT GEOPHYSICAL HORIZONS
190				Dolomite, Sandy Set Well at 199.93' (1033.07) (continued)		
200						
210						

Bottom of borehole at 210.0 feet.

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZW\VERSW167824\3-ENV-STDY-REGS\31-ENV-RPTH\HYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ



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BORING NUMBER MW-7

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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
DRILLING CONTRACTOR	Exploration Technology	GROUND ELEVATION	1255.7 ft
DRILLING METHOD	Mud Rotary	HOLE SIZE	6 inches
LOGGED BY	Central Wis. Engineers	CHECKED BY	M. Lindenfelser
NOTES	Geophysical log completed by SEH during November 2022.		
GROUND WATER LEVELS:		AT TIME OF DRILLING ---	
		AT END OF DRILLING ---	
		AFTER DRILLING ---	

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS)	SELECT GEOPHYSICAL HORIZONS
0					50 100 150 200	
0.5				(OL) TOPSOIL	1255.2	
				(CL) Clay, light Brown to Gray-Brown,		
7.0				(CL) Clay, Red-Brown to Yellow, With Red Sand	1248.7	
10.5				(CL) Clay, Red-Brown, With Occasional Silt and Sand	1245.2	
21.5				Weathered Dolomite With Interspersed Red Clay Residuum	1234.2	
44.0				Dolomite, With Occasional Small Vugs and Chert	1211.7	
50						H5 - 1205.7

(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-7

PAGE 2 OF 4

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, With Occasional Small Vugs and Chert (<i>continued</i>)		
				58.0 1197.7		
				Dolomite, With Occasional large Vugs		
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\UZW\VERSW167824\3-ENV-STDY-REGS\31-ENV-RPTHYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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Short Elliott Hendrickson Inc.

BORING NUMBER MW-7

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CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\U2\VERSW167824\3-ENV-STDY-REGS\31-ENV-RPTHYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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 (<i>continued</i>)		
130				130.0 1125.7 Sandy Dolomite, With Occasional Gray-Green hale Interbeds; Few to No Vugs		
140						H2 - 1119.7
150				148.0 1107.7 Dolomite, With Occasional Sandy To Shaly Interbeds; Few Small Vugs		H1 - 1107.7
				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						

(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-7

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CLIENT Vernon County PROJECT NAME Vernon County Landfill
PROJECT NUMBER VERSW 167824 PROJECT LOCATION Viroqua, Wisconsin

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZI\VERSW167824\3-ENV-STDY-REGS\31-ENV-RPTHYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS)	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.



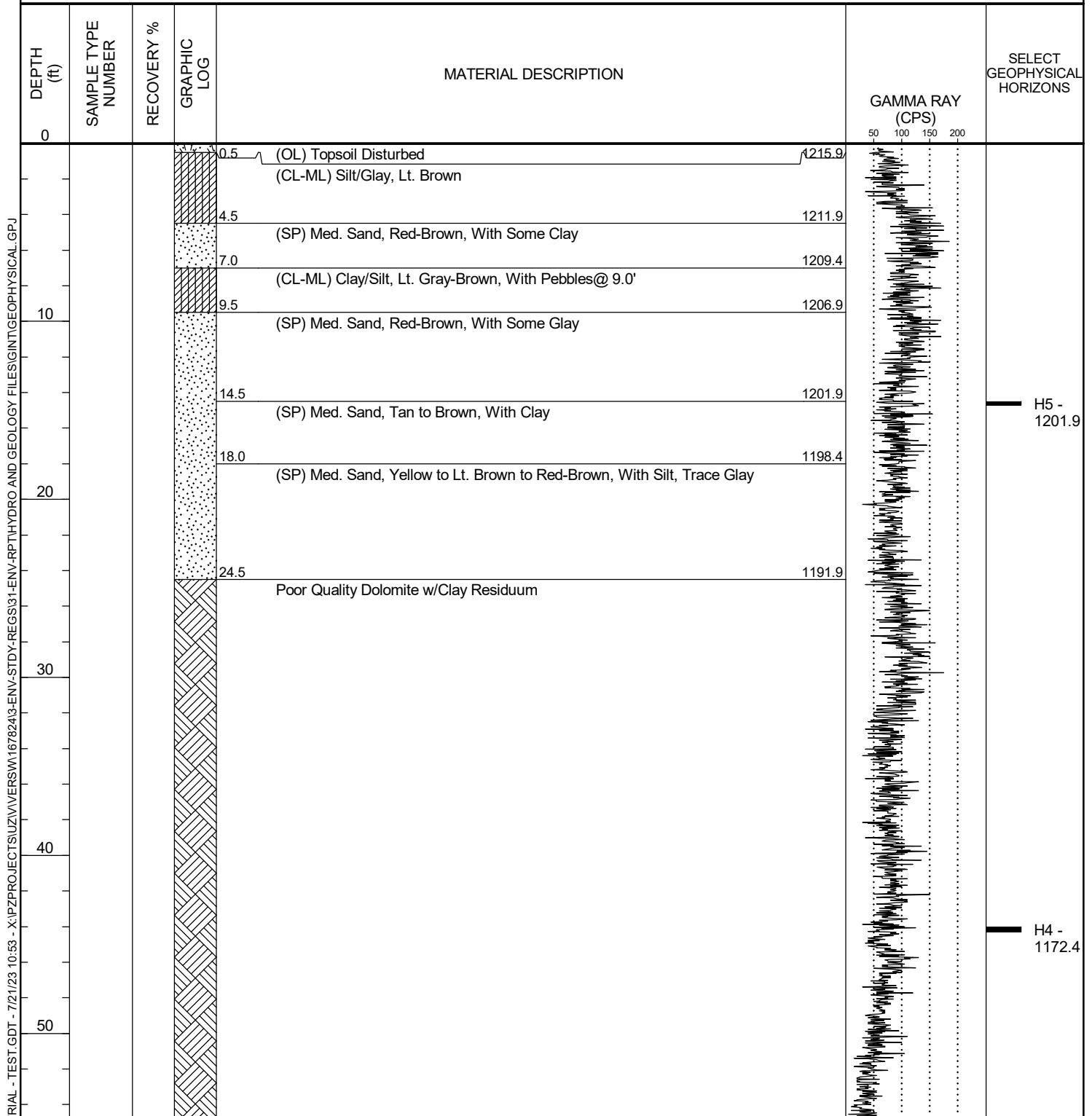
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BORING NUMBER MW-12

PAGE 1 OF 2

CLIENT Vernon CountyPROJECT NAME Vernon County LandfillPROJECT NUMBER VERSW 167824PROJECT LOCATION Viroqua, WisconsinDATE STARTED 9/22/89 COMPLETED 9/22/89GROUND ELEVATION 1216.4 ft HOLE SIZE 6 inchesDRILLING CONTRACTOR Exploration Technology

GROUND WATER LEVELS:

DRILLING METHOD Mud RotaryAT TIME OF DRILLING ---LOGGED BY Central Wis. Engineers CHECKED BY M. LindenfelserAT END OF DRILLING ---NOTES Geophysical log completed by SEH during November 2022.AFTER DRILLING ---

(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-12

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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)	SELECT GEOPHYSICAL HORIZONS
				Poor Quality Dolomite w/Clay Residuum (<i>continued</i>)		
60				61.0 Dolomite, With Occasional Small Vugs 1155.4		H3 - 1155.4
70				71.5 Poorly Consolidated Silty Sandstone 1144.9		
				74.0 Dolomite, With Occasional Small Vugs 1142.4		
80						
90						
100				100.0 Dolomite, With Occasional Sandstone and Gray-Green Shale Interbeds 1116.4		
				103.0 1113.4		

Bottom of borehole at 103.0 feet.



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BORING NUMBER MW-14WT

PAGE 1 OF 2

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)	SELECT GEOPHYSICAL HORIZONS
0					50 100 150 200	
	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)		
	SS 5	33		NOTE: Mottled below 7 feet bgs.		
10	SS 6	89		12.0 1235.2		
	SS 7	89		(CL) SANDY LEAN CLAY (CL), brown, moist, trace gravel, mottled (Residuum)		
	SS 8	100		14.5 1232.7		
	SS 9	100		NOTE: Light brown sand layer <1" thick at 13.5 feet bgs.		
	SS 10	100		(CH) FAT CLAY (CH), brown to reddish brown, moist, little sand, stiff (Residuum)		
20	SS 11	100		NOTE: Light brown sand layer <1" thick at 15 feet bgs.		
	SS 12	100		26.0 1221.2		
	SS 13	100		(CL) SANDY LEAN CLAY (CL), brown, moist, stiff		
30	SH 14	100		28.5 1218.7		
	SS 15	20		29.5 1217.7		
	SS 16			DOLOSTONE, fractured, hard drilling from 28.5 to 33.5 feet, switched to mud rotary at 33.5 feet		
	SS 17			No recovery		
	SS 18			36.9 1210.3		
40	RC 19	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
	SS 20			44.5 1202.7		
	SS 21			No recovery, void from 48.0 to 49.0 feet		
50	SS 22	80		49.5 1197.7		
	SS 23			Light brown poorly graded sand, fine to coarse		
	SS 24			52.5 1194.7		
	SS 25			DOLOSTONE, gray to brown, fine grained, 5 to 10mm vugs throughout with mineralization, chert at approximately 53.0 feet, very fractured, difficult coring.		

(Continued Next Page)



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BORING NUMBER MW-14WT

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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	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				End of coring at 60.5 feet due to formation too difficult to core.	1186.7	
70						
80						H4 - 1173.2
90						
100						H3 - 1153.2
109.0					1138.2	

Boring Terminated at 109 feet.
Bottom of borehole at 109.0 feet.

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZZ\VERSW167824\3-ENV-STDY-REGS\31-ENV-RPTHYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ



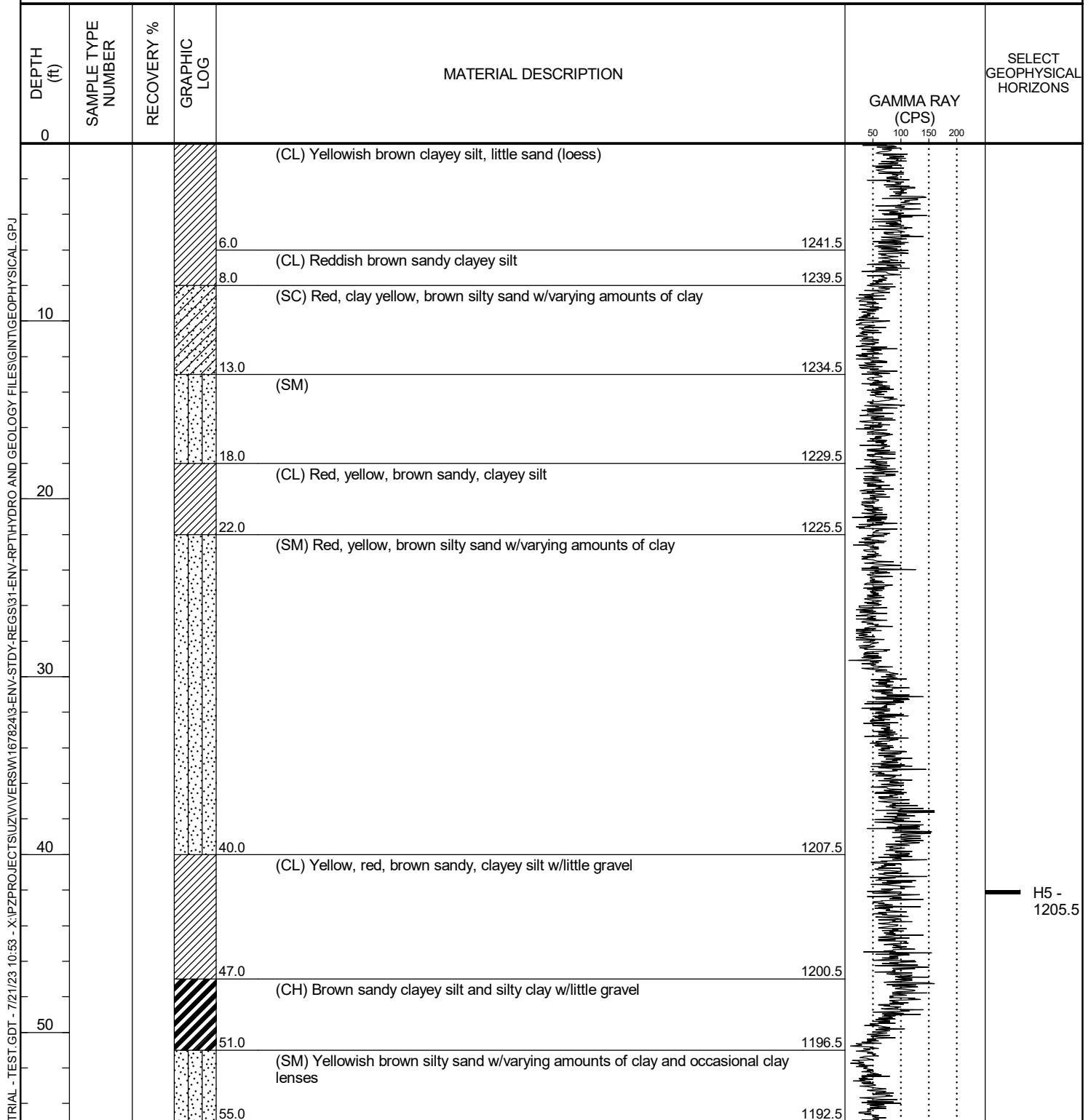
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BORING NUMBER MW-14Z

PAGE 1 OF 4

CLIENT Vernon CountyPROJECT NAME Vernon County LandfillPROJECT NUMBER VERSW 167824PROJECT LOCATION Viroqua, WisconsinDATE STARTED 3/5/03 COMPLETED 3/7/03GROUND ELEVATION 1247.5 ft HOLE SIZE 7 inchesDRILLING CONTRACTOR Braun Intertec

GROUND WATER LEVELS:

DRILLING METHOD RotasonicAT TIME OF DRILLING ---LOGGED BY Central Wis. Engineers CHECKED BY M. LindenfelserAT END OF DRILLING ---NOTES Geophysical log completed by SEH during November 2022.AFTER DRILLING ---

(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-14Z

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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
				(SP-SM)		
60				58.0 1189.5		
				(SM)		
				62.0 1185.5		
				(SC) Brown silty clayey sand and sandy, clayey silt, little to trace gravel		
70				66.0 1181.5		
				(CL)		
				71.0 1176.5		
				(SM) Grayish brown silty sand, little to trace clay and occasional coarse gravel		
80						H4 - 1173.5
				84.0 1163.5		
				(ML)		
90						
				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						

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\UZW\VERSW167824\3-ENV-STDY-REGS\31-ENV-RPTHYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-14Z

PAGE 3 OF 4

CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin

TRIAL - TEST.GDT - 7/21/23 10:53 - X:\PZPROJECTS\U2\VERSW167824\3-ENV-STDY-REGS\31-ENV-RPTHYDRO AND GEOLOGY FILES\GINT\GEOPHYSICAL.GPJ

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		

(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-14Z

PAGE 4 OF 4

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)	SELECT GEOPHYSICAL HORIZONS
182.0				Dolomite (Highly fractured zone @ 183' - 186') (<i>continued</i>)	1065.5	
				Sandy dolomite and dolomitic sandstone (Highly fractured zone @ 191' - 195' and 198' - 199')		
190						
200						
206.0				Silty, dolomitic sandstone with shale partings	1041.5	
210					1037.5	
210.0						

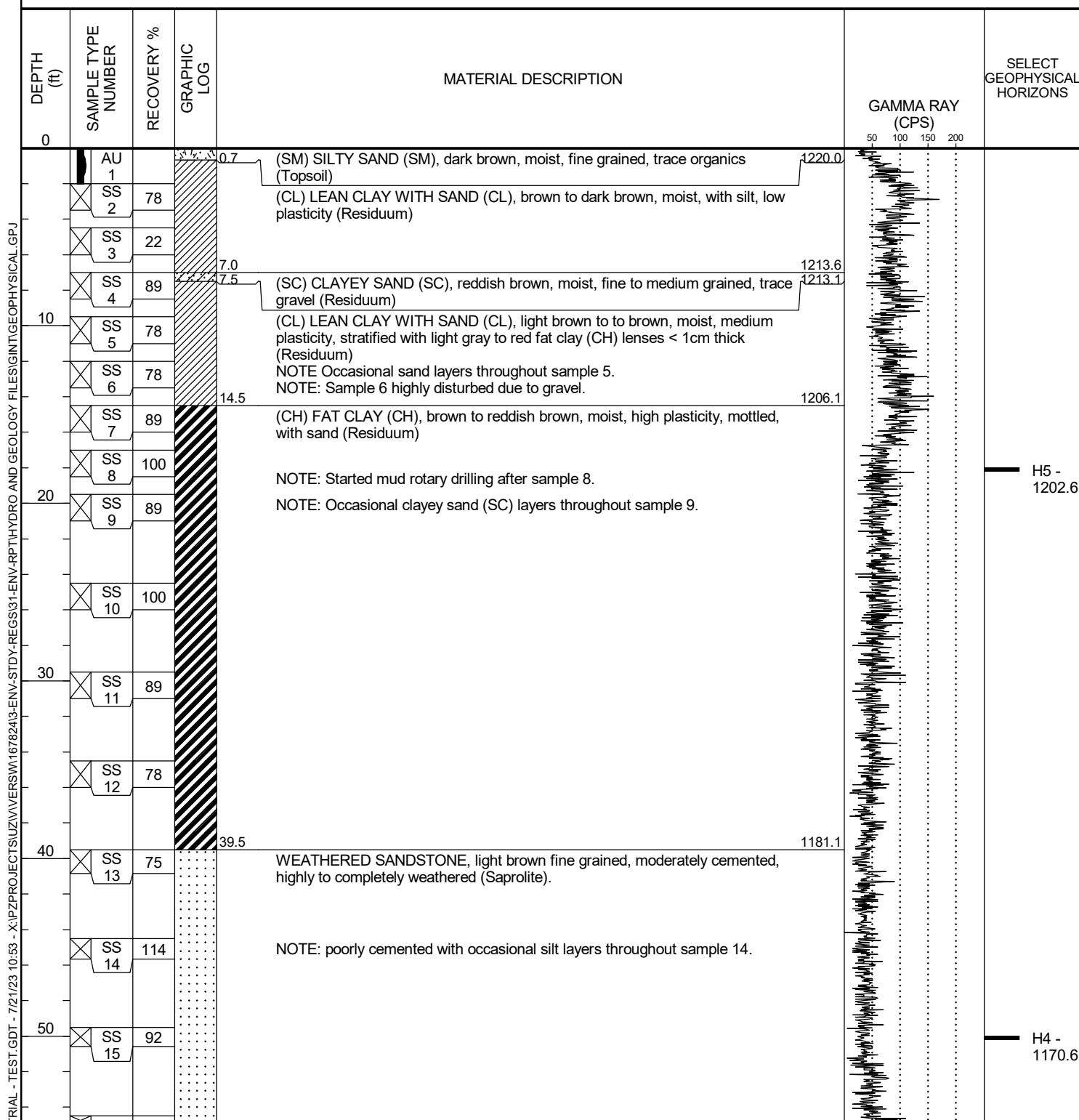
Bottom of borehole at 210.0 feet.



Short Elliott Hendrickson Inc.

BORING NUMBER MW-15WT

PAGE 1 OF 2

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** ---

(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-15WT

PAGE 2 OF 2

CLIENT Vernon County

PROJECT NAME Vernon County Landfill

PROJECT NUMBER VERSW 167824

PROJECT LOCATION Viroqua, Wisconsin

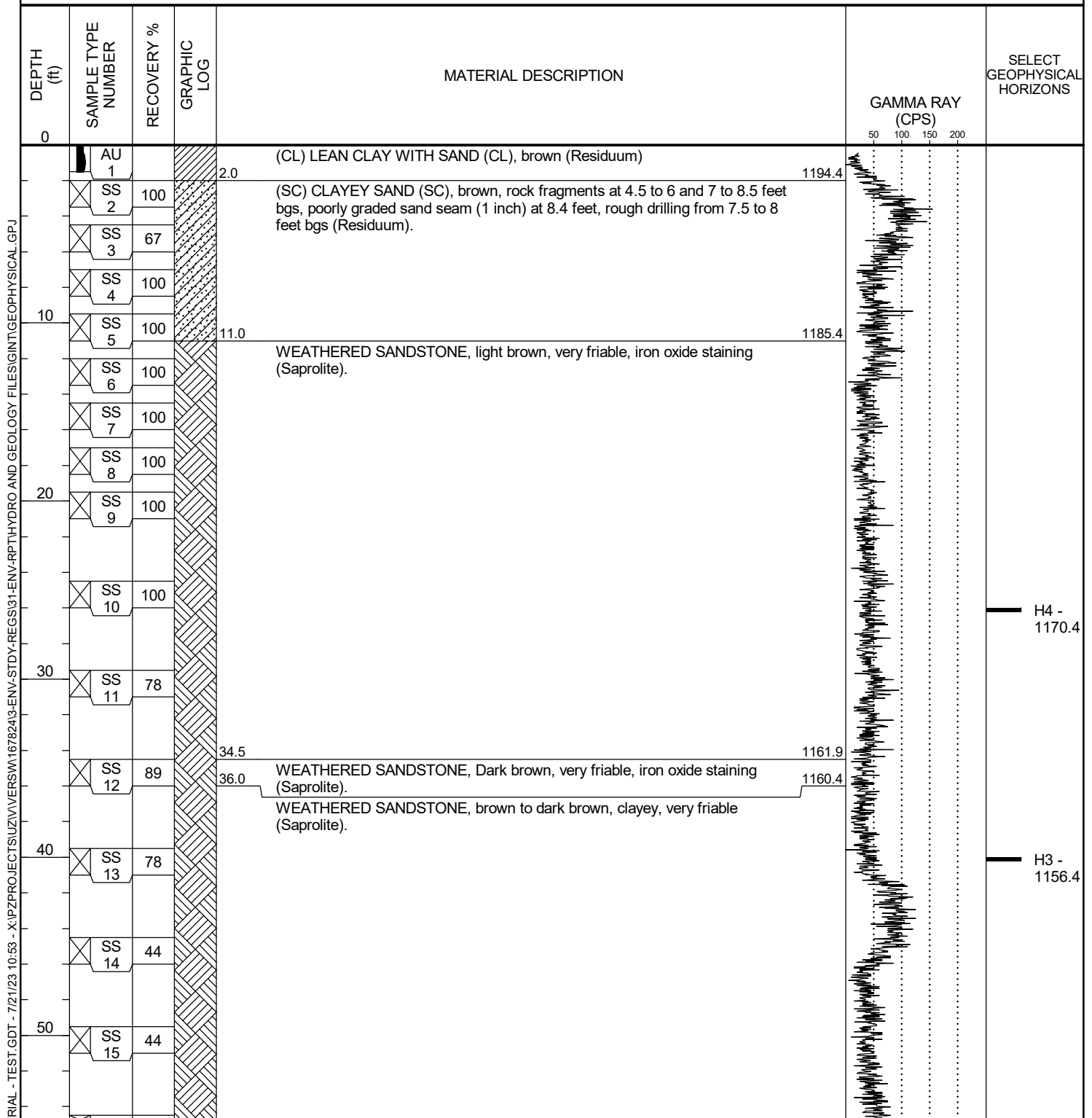
DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	GAMMA RAY (CPS) 50 100 150 200	SELECT GEOPHYSICAL HORIZONS
60	SS 16	78		WEATHERED SANDSTONE, light brown fine grained, moderately cemented, highly to completely weathered (Saprolite). <i>(continued)</i>		
	SS 17	78				H3 - 1155.6
70	SS 18	50		SANDY DOLOSTONE, light brown, moderately weathered to fresh.		
80						
90						
99.0				Boring Terminated at 99 feet. Bottom of borehole at 99.0 feet.		



Short Elliott Hendrickson Inc.

BORING NUMBER MW-17WT

PAGE 1 OF 2

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** ---

(Continued Next Page)



Short Elliott Hendrickson Inc.

BORING NUMBER MW-17WT

PAGE 2 OF 2

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)	SELECT GEOPHYSICAL HORIZONS
	SS 16	100		WEATHERED SANDSTONE, brown to dark brown, clayey, very friable (Saprolite). (continued)	50 100 150 200	
60	SS 17	44				
	SS 18	6				
70						H2 - 1126.4
80						
90						
93.0				Boring Terminated at 93 feet. Bottom of borehole at 93.0 feet.	1103.4	

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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

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

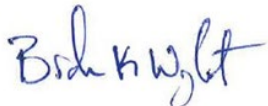
Dear Ms. Sanborn:

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

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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
		$\tan(\phi)$	0.22	0.43	0
B-20*	0 – 2	Cohesion, tsf	0.4281	0	0.4152
		ϕ , degrees	15.4	34.8	0
		$\tan(\phi)$	0.28	0.69	0
MW-16	7 – 9	Cohesion, tsf	0.9366	0.2976	---
		ϕ , degrees	11.4	28.5	---
		$\tan(\phi)$	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



 DENOTES APPROXIMATE LOCATION OF
STANDARD PENETRATION TEST BORING



100' 0 200'

SCALE: 1"= 200'

**BRAUN
INTERTEC**
The Science You Build On.

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**

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		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		FILL: POORLY GRADED SAND (SP), fine to medium-grained, orangish brown, moist		3-7-8 (15) 14"		10	
1230.0		FILL: CLAYEY SAND (SC), orangish brown with black, moist	10	2-7-9 (16) 14"		15	LL=39, PL=15, PI=24
1227.5		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		CLAYEY SAND (SC), brown, moist, very stiff (ALLUVIUM)	15	5-8-8 (16) 16"		20	
1222.5		FAT CLAY (CH), trace Gravel, reddish brown, moist, stiff (RESIDUUM)	20	3-3-12 (15) 12"		16	
1216.0				14-12-10 (22) 14"			
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"			
1208.0			30				No recovery
31.0		END OF BORING		50/1" (REF)			Water not observed while drilling.
		Boring then grouted					

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		FILL: SANDY FAT CLAY (CH), brown and red, moist	5	2-3-2 (5) 10"		44	
4.0				4-2-2 (4) 12"		53	
			10	2-2-2 (4) 14"		54	
1221.8		FILL: CLAYEY GRAVEL (GC), fine to coarse-grained, dark brown and gray, moist		1-2-1 (3) 6"		33	
11.5			15	1-1-1 (2) 8"		40	
1216.8		FILL: FAT CLAY (CH), dark brown, moist		1-1-2 (3) 14"		57	LL=105, PL=34, PI=71
16.5			20	0-1-5 (6) 6"		57	
1210.3		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"			
23.0							
1202.3		END OF BORING	30	50/1" (REF)			Water not observed while drilling.
31.0		Boring then grouted					

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		FILL: SANDY FAT CLAY (CH), brown, moist		2-3-6 (9) 12"		33	
6.5							
1206.8		FILL: CLAYEY SAND with GRAVEL (SC), dark brown and black, moist	10	2-12-11 (23) 12"		15	
9.0							
1204.3		FILL: SANDY FAT CLAY (CH), dark brown and gray, moist		3-4-5 (9) 12"		30	
11.5			15	2-1-2 (3) 14"		46	
1199.3		FILL: SANDY FAT CLAY (CH), reddish brown and black, moist		5-4-4 (8) 16"		39	
16.5			20	4-7-10 (17) 16"			
1194.8		POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, tan, moist, medium dense (RESIDUUM)					
21.0		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"			
1192.8							
23.0			30	14-18-50/5" (REF) 10"			
1184.8		END OF BORING					Water not observed while drilling.
31.0		Boring then grouted					

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		FILL: FAT CLAY (CH), medium to coarse-grained, trace Gravel, brown, moist	5	1-1-2 (3) 8"		25	
1219.6		FILL: SANDY SILT (ML), trace roots, dark brown, moist		1-4-8 (12) 12"		19	
1217.1		FILL: LEAN CLAY (CL), trace Gravel, dark brown, moist	10	3-6-7 (13) 12"		17	LL=36, PL=18, PI=18
1214.6		FILL: LEAN CLAY (CL), trace organic, dark brown, moist		3-7-8 (15) 14"		19	LL=36, PL=22, PI=14
1211.6		FILL: LEAN CLAY (CL), trace Sand, brown, moist	15	2-3-5 (8) 10"		20	
14.5				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		FILL: LEAN CLAY (CL), gray to brown, moist	25	9-7-8 (15) 12"		19	
23.0				4-6-10 (16) 14"		18	LL=33, PL=20, PI=13
1195.1		END OF BORING					Water not observed while drilling.
31.0		Boring then grouted					

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		FILL: CLAYEY SAND (SC), brown, moist	5	4-7-7 (14) 18"			
1240.6		FILL: SANDY FAT CLAY (CH), fine to coarse-grained, brownish red, moist		4-3-6 (9) 18"		37	LL=64, PL=42, PI=22
1235.6			10	8-6-11 (17) 6"			
1233.2		FILL: SILTY CLAY (CL-ML), fine to medium-grained, light gray, moist		3-4-8 (12) 16"			
1230.6		FILL: LEAN CLAY (CL), reddish brown, moist	15	3-5-6 (11) 16"			
1228.2		FILL: CLAYEY SAND (SC), brown, moist		14-12-8 (20) 18"			
1224.2		SILTY SAND (SM), orangish brown, moist, medium dense (ALLUVIUM)	20	6-8-12 (20) 18"			
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

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	50/0" (REF)					
			50	50/5" (REF)					
1196.6 50.5		ST. LAWRENCE FORMATION, DOLOSTONE, tan, dry to moist, slightly weathered, moderately hard to hard	55	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	60			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

Continued on next page

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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		FILL: FAT CLAY (CH), with Sand Layers, orangish brown, moist		5-4-5 (9) 16"			
6.0							
1211.6		FILL: CLAYEY SAND (SC), brown, moist		6-6-22 (28) 14"			
9.0			10				
1209.1		FILL: FAT CLAY (CH), with Clayey Sand Layers, dark brown to reddish brown, moist		3-4-5 (9) 14"			
11.5				3-3-4 (7) 16"			
			15				
				2-4-4 (8) 18"			
				2-4-6 (10) 18"			
1200.6		SANDY FAT CLAY (CH), with Poorly Graded Sand layers, brown, moist, stiff (ALLUVIUM)					
20.0			20				
1198.1		FAT CLAY (CH), trace Gravel, dark brown, moist, stiff to very stiff (ALLUVIUM)		2-6-9 (15) 16"			
22.5			25				
				9-8-4 (12) 16"			
			30				

Continued on next page

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
1182.6		FAT CLAY (CH), trace Gravel, dark brown, moist, stiff to very stiff (ALLUVIUM)	35	2-1-1 (2) 14"			
38.0		SANDY SILT (ML), with Clay seams, tan to gray, moist, very dense (RESIDUUM)	40	38-17-50/4" (REF) 12"			
1173.1			45	10-15-50/2" (REF) 14"			
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		CLAYEY SAND (SC), orangish brown, moist, stiff (RESIDUUM)	65	6-5-10 (15) 14"			
62.5							
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							

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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	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	100				Water not observed while drilling.

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					
			5	2-2-2 (4) 0"			No recovery
				1-1-2 (3) 10"			
1175.8				2-3-3 (6) 14" TW			LL=43, PL=21, PI=22
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				8-7-6 (13) 14"			
14.0		CLAYEY SAND with GRAVEL (SC), fine to coarse-grained, brown and yellow, moist, stiff (ALLUVIUM)	15	4-4-6 (10) 18"			
				4-5-6 (11) 18"			
			20				
				4-4-5 (9) 14"		18	LL=41, PL=24, PI=17
			25				
				8-7-5 (12) 8"			
			30				
1151.8		CLAYEY GRAVEL (GC), fine to coarse-grained, brown, moist, medium dense to very dense (RESIDUUM)					
33.0							

Continued on next page

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"			Groundwater not observed above mud rotary depth
			40	6-15-42 (57)			
			45	5-8-16 (24) 16"			
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

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"			
			95	50/1" (REF) 1"			
1086.8 98.0		END OF BORING	100				Permanent monitoring well installed with screen set from 92 to 97 feet Water not observed while drilling.

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		FILL: CLAYEY SAND (SC), trace Gravel, brown, moist		14-10-12 (22) 14"		17	LL=39, PL=27, PI=12
6.0			10	10-10-10 (20) 16"		16	LL=41, PL=29, PI=12
1184.9		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, brown, moist		14-14-25 (39) 14"			
11.5			15	24-40-40 (80) 14"			
1179.9		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, with thin clay layers, light brown, moist		15-9-10 (19) 16"			
16.5			20	7-14-34 (48) 16"			Began mud rotary drilling at 20 feet
			25	12-14-16 (30) 16"			
1167.9		SILTY SAND (SM), fine to medium-grained, orangish brown, moist, medium dense (ALLUVIUM)		4-5-11 (16) 14"			
28.5			30				

Continued on next page

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	

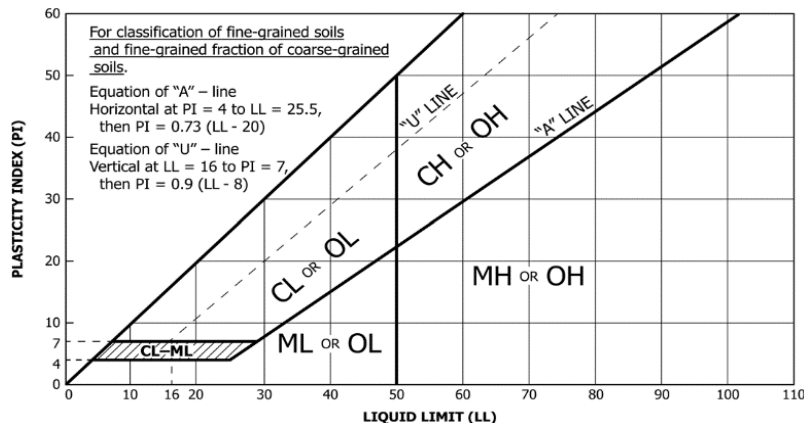
Elev./Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q _p tsf	MC %	Tests or Remarks
1158.9		SILTY SAND (SM), fine to medium-grained, orangish brown, moist, medium dense (ALLUVIUM)	35	10-15-32 (47) 14"			
37.5		CLAYEY SAND (SC), with Silt, brown, moist, stiff (ALLUVIUM)	40	8-6-6 (12) 12"			
1153.4		SANDY SILT (ML), brown, moist, very dense (RESIDUUM)	45	35-50/2" (REF) 6"			
1148.4		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		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

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
		ST. LAWRENCE FORMATION, DOLOSTONE, tan, moist, highly weathered, soft to moderately hard, retrieved as "Silty Sand (SM)" in our split- spoon sampler.	70				Permanent monitoring well installed with screen set from 77 to 87 feet
			75				
			80				
			85				
			90				
1103.4							
93.0		END OF BORING	95				
			100				

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 ^{EFG}	
			Fines Classify as CL or CH	GC	Clayey gravel ^{EFG}	
	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 ^{FGI}	
			Fines classify as CL or CH	SC	Clayey sand ^{FGI}	
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 ^{KLM}	
			PI < 4 or plots below "A" line ^J	ML	Silt ^{KLM}	
		Organic	Liquid Limit – oven dried Liquid Limit – not dried <0.75	OL	Organic clay ^{KLMN} Organic silt ^{KLMQ}	
			PI plots on or above "A" line	CH	Fat clay ^{KLM}	
	Silts and Clays (Liquid limit 50 or more)	Inorganic	PI plots below "A" line	MH	Elastic silt ^{KLM}	
			Liquid Limit – oven dried Liquid Limit – not dried <0.75	OH	Organic clay ^{KLMP} Organic silt ^{KLMQ}	
		Organic	Liquid Limit – oven dried Liquid Limit – not dried <0.75	OH	Organic clay ^{KLMP} Organic silt ^{KLMQ}	
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 $\geq 15\%$ 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 $\geq 15\%$ 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 $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.
M. If soil contains $\geq 30\%$ 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.



DD Dry density, pcf
WD Wet density, pcf
P200 % Passing #200 sieve

Laboratory Tests
OC Organic content, %
qp Pocket penetrometer strength, tsf
mc Moisture content, %
qu Unconfined compression test, tsf

LL Liquid limit
PL Plastic limit
PI Plasticity index

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..... $\geq 15\%$

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 (.

Appendix B

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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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

Results: The test is for informational purposes.

Bob K. Wilt

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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

Results: The test is for informational purposes.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, 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 the prior written approval.

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Barb K. Wilt

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

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Viroqua, WI 54665

Project:

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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

<u>Description</u>	<u>Result</u>	<u>Specifications</u>
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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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

<u>Description</u>	<u>Result</u>	<u>Specifications</u>
Liquid Limit:	35	-
Plastic Limit:	23	
Plastic Index:	12	-
Soil Classification:	CL SANDY LEAN CLAY	

General

Results: The test is for informational purposes.



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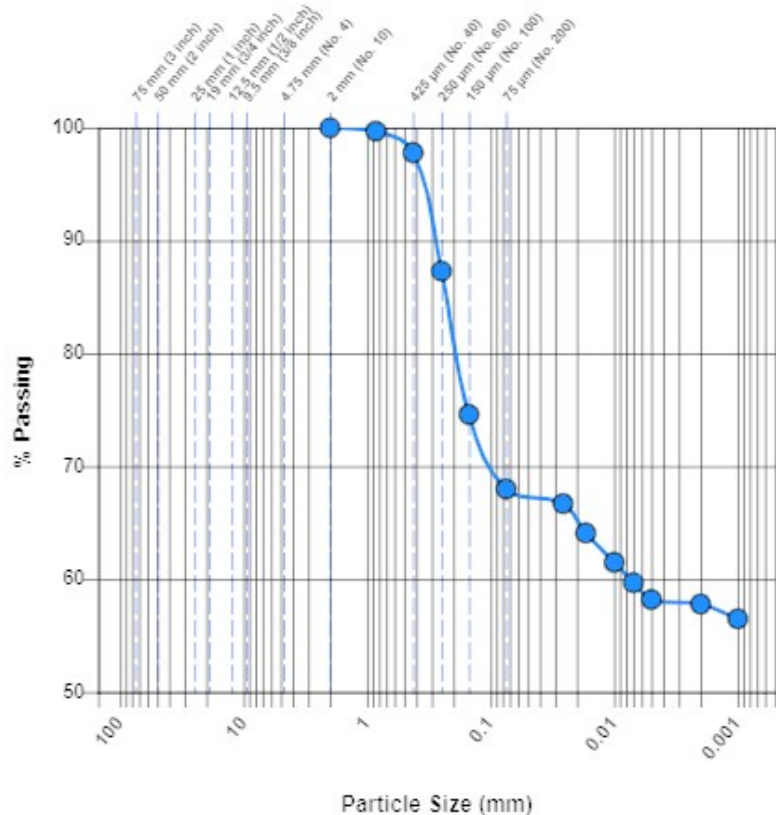
Sample Information

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
D₆₀ (µm): 7.5			

General

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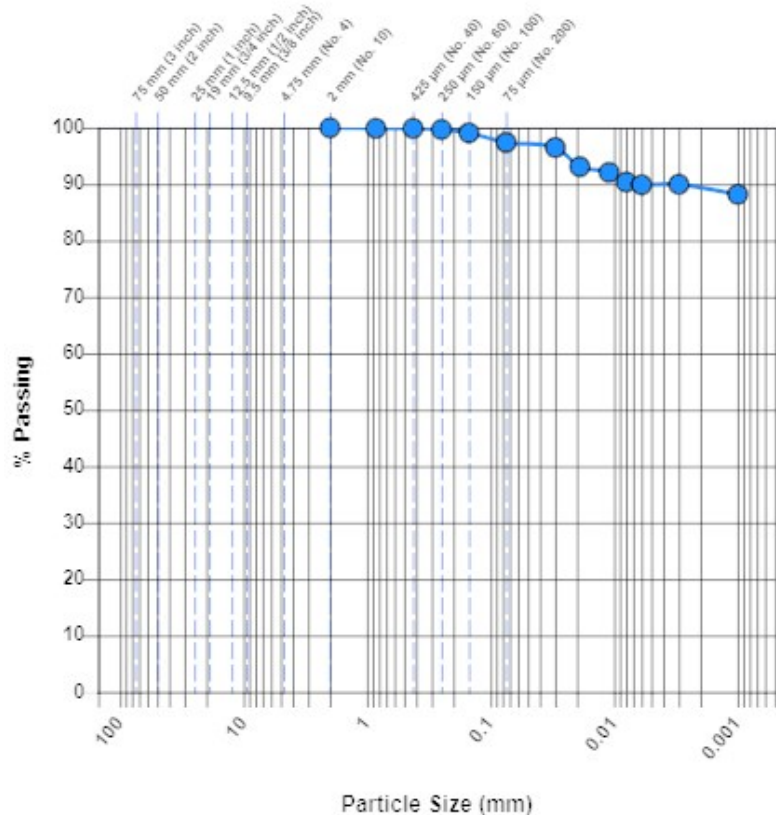
Sample Information

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

General

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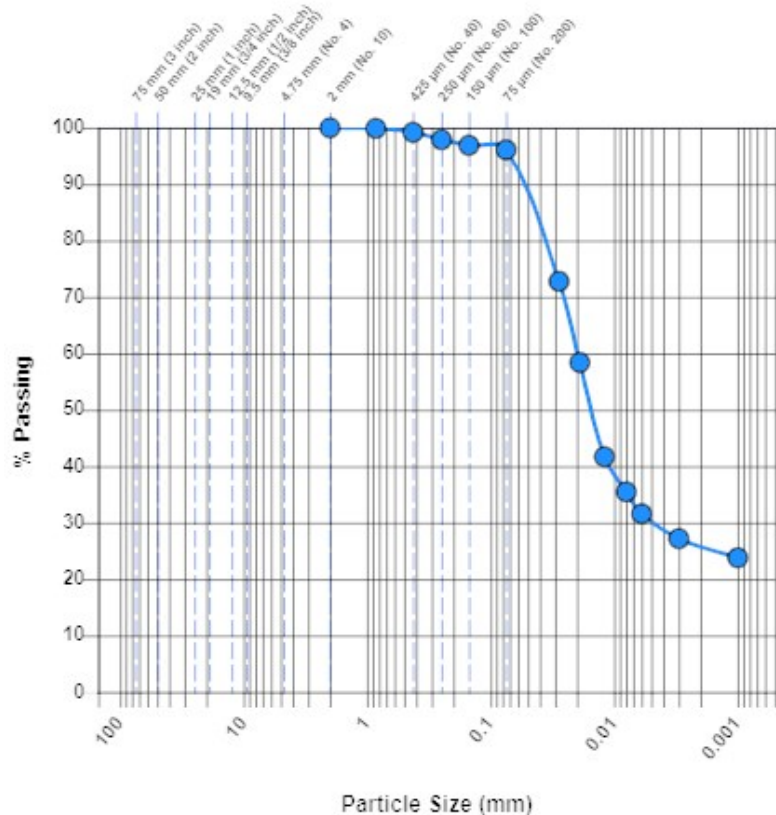
Sample Information

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
D₆₀ (µm):	20.0	D₃₀ (µm):	4.9				

General

Bob K. Wilt

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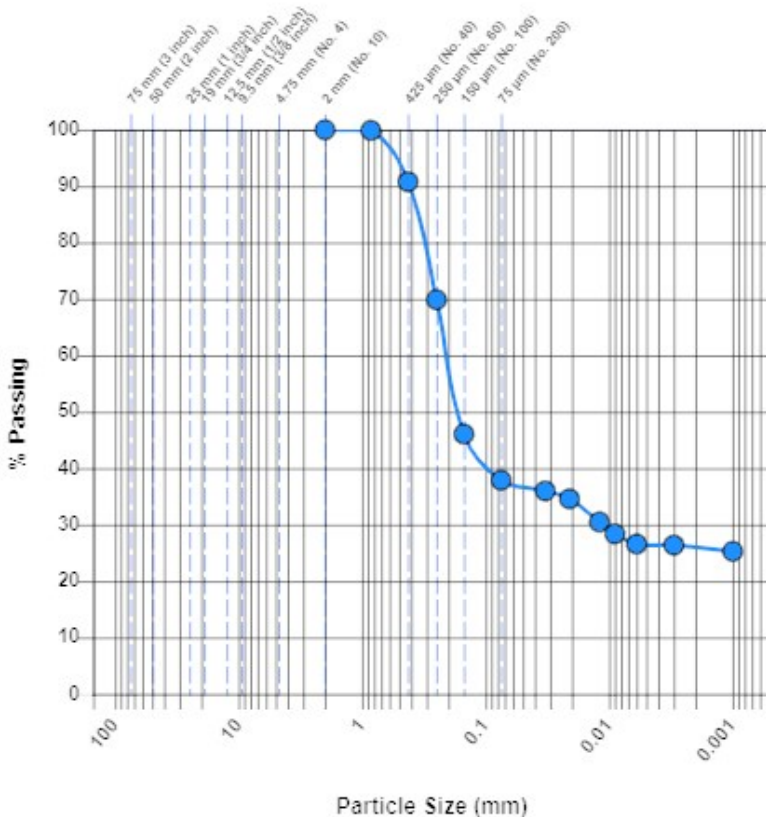
Sample Information

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
D₆₀ (µm):	208.4	D₃₀ (µm):	11.3				

General

Bob K. Wilt

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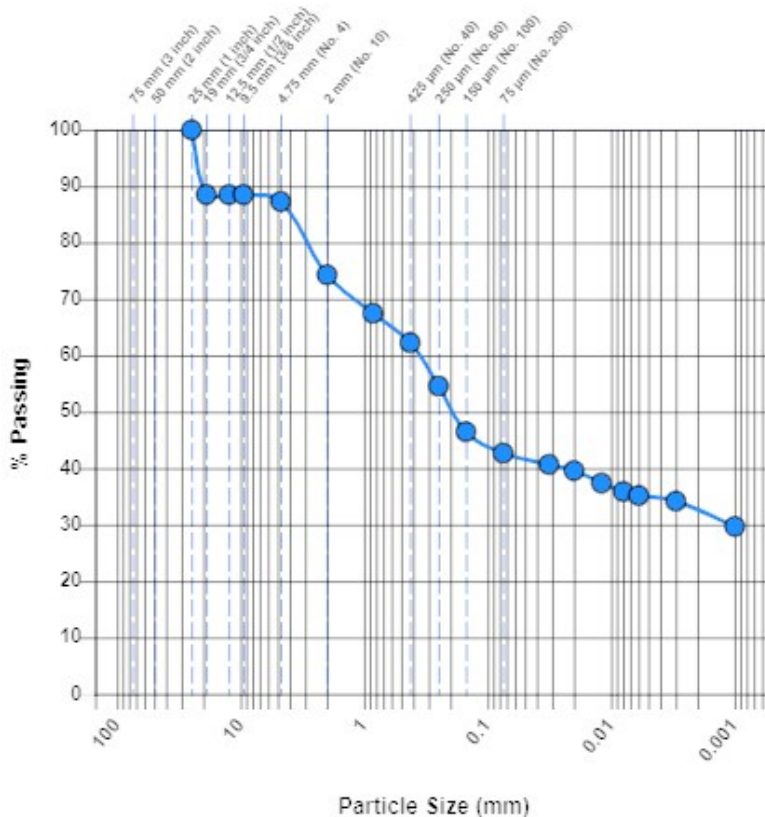
Sample Information

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
D₆₀ (µm):	372.7	D₃₀ (µm):	1.1				

General

Bob K. Wilt

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
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S3705 County Road LF
Viroqua, WI 54665

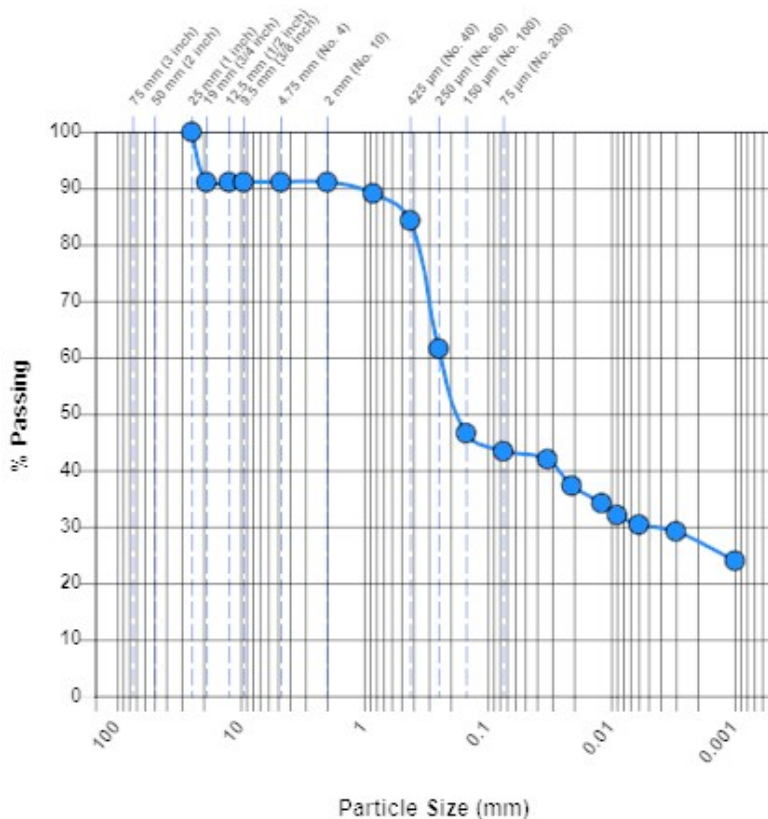
Sample Information

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
D₆₀ (µm):	239.3	D₃₀ (µm):	5.0				

General

Bob K. Wilt

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

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Vernon County Solid Waste & Recycling
Department
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Viroqua, WI 54665

Project:

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Vernon County Landfill
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Viroqua, WI 54665

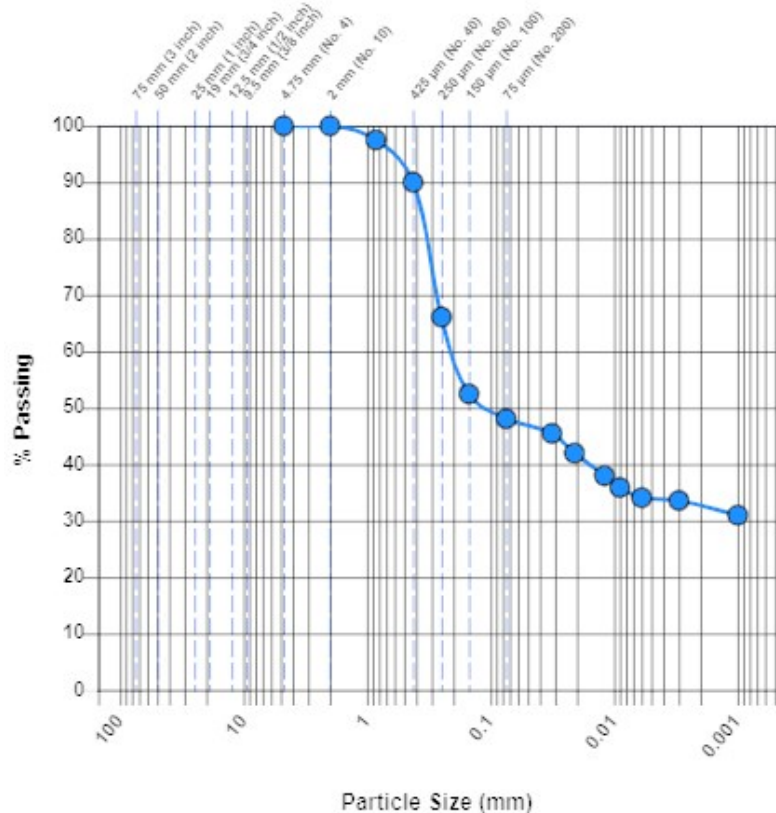
Sample Information

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
D₆₀ (µm):	205.1						

General

Bob K. Wilt

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
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S3705 County Road LF
Viroqua, WI 54665

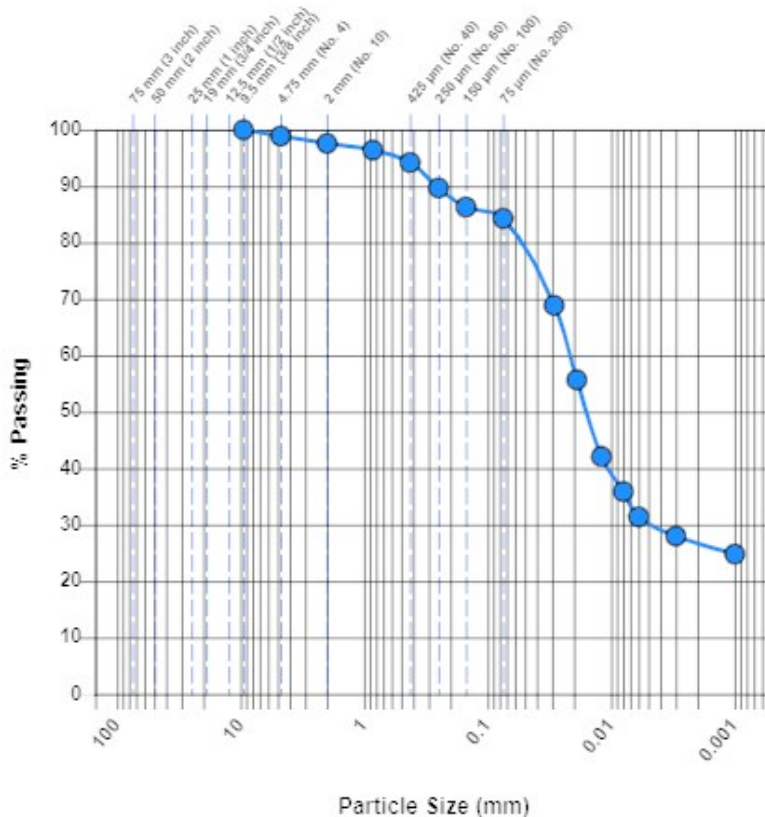
Sample Information

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
D₆₀ (µm):	22.3	D₃₀ (µm):	4.8				

General

Bob K. Wilt

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

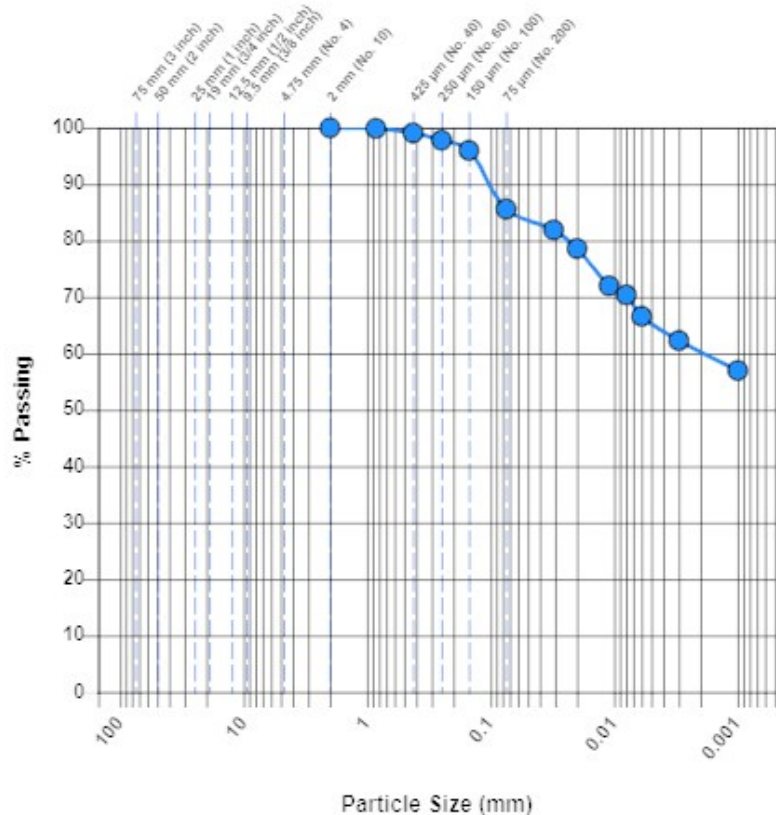
Sample Information

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
D₆₀ (µm):	2.1						

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11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling
Department
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Viroqua, WI 54665

Project:

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S3705 County Road LF
Viroqua, WI 54665

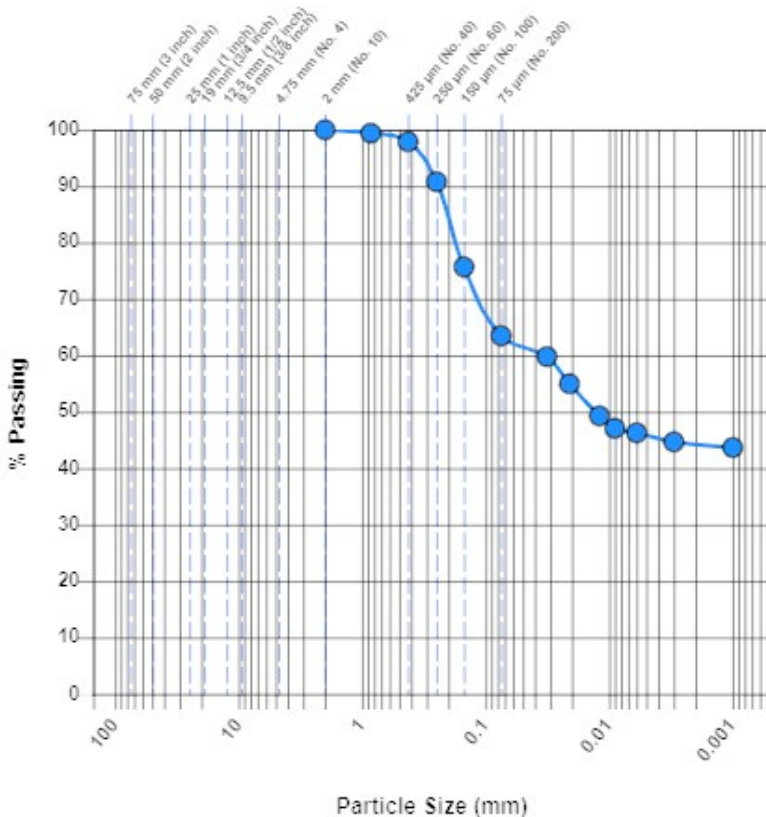
Sample Information

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
D₆₀ (µm):	34.3						

General

Bob K. Wilt

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:

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S3705 County Road LF
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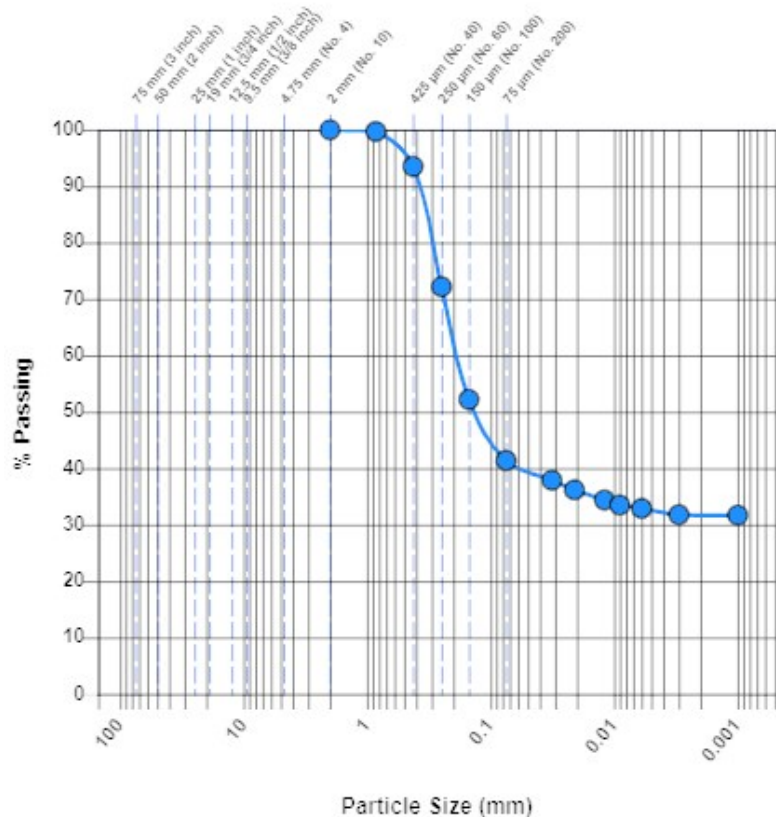
Sample Information

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
D₆₀ (µm):	189.0						

General

Bob K. Wilt

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:

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S3705 County Road LF
Viroqua, WI 54665

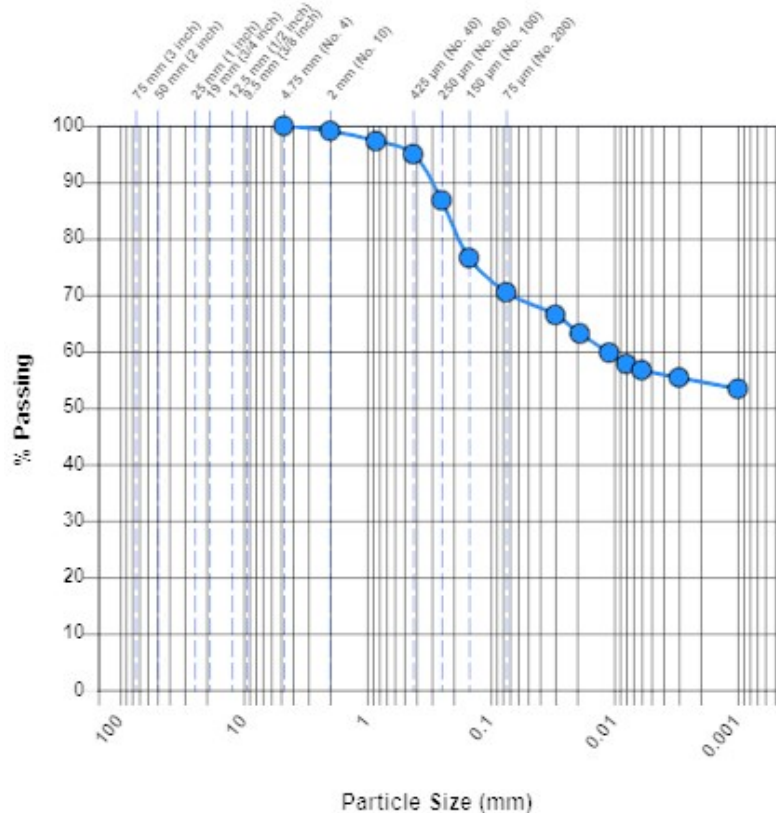
Sample Information

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
D₆₀ (µm):	11.5						

General

Bob K. Wilt

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:

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S3705 County Road LF
Viroqua, WI 54665

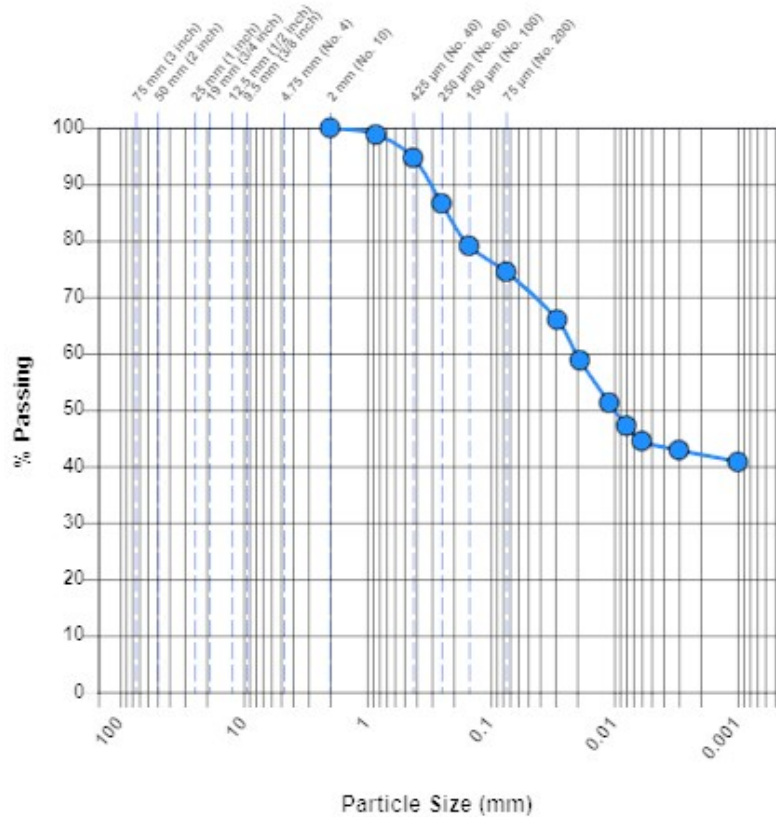
Sample Information

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
D₆₀ (µm):	20.7						

General

Bob K. Wilt

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
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S3705 County Road LF
Viroqua, WI 54665

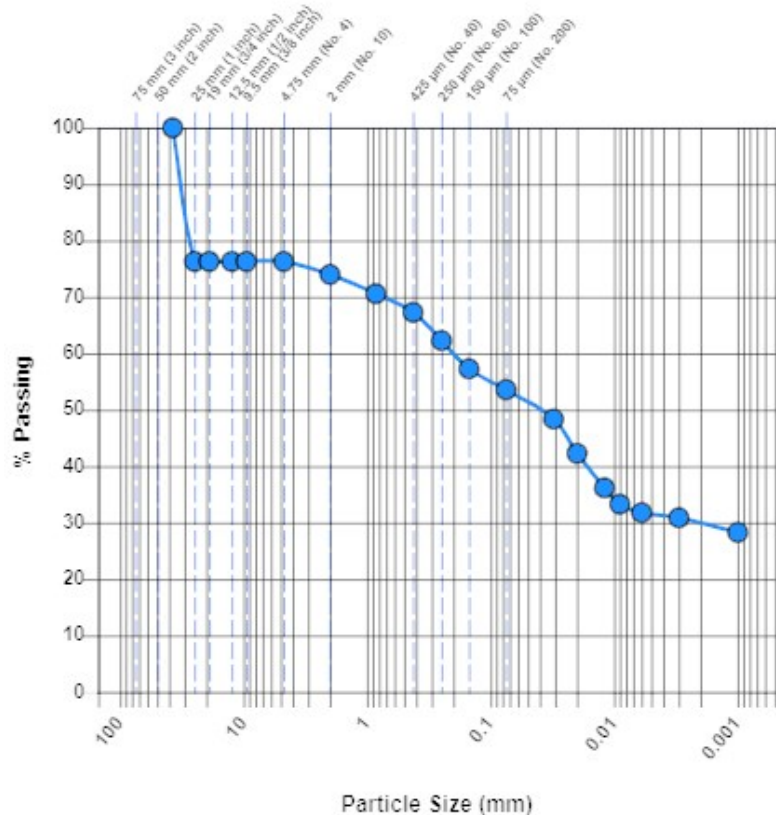
Sample Information

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
D₆₀ (µm): 204.0 **D₃₀ (µm):** 2.3

General

Bob K. Wilt

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Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling
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Viroqua, WI 54665

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S3705 County Road LF
Viroqua, WI 54665

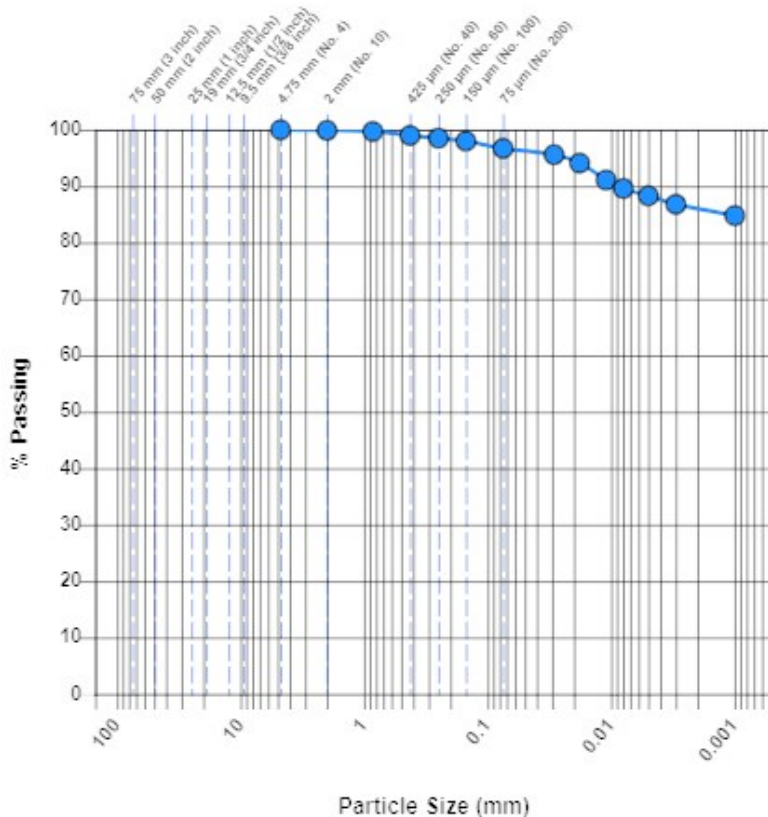
Sample Information

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

General

Bob K. Wilt

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling
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S3705 County Road LF
Viroqua, WI 54665

Project:

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S3705 County Road LF
Viroqua, WI 54665

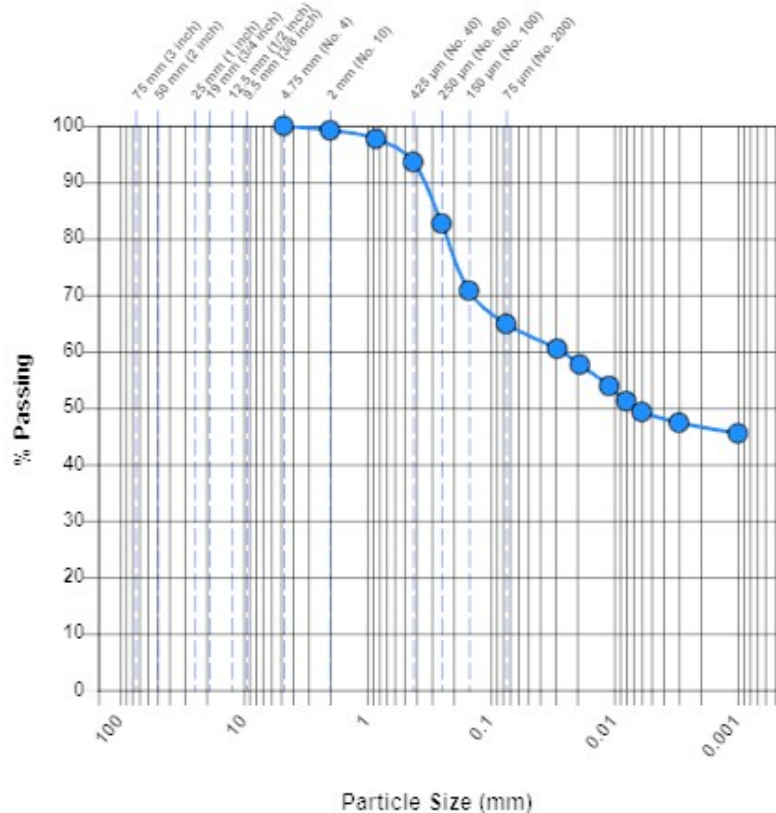
Sample Information

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
D₆₀ (µm):	27.2						

General

Bob K. Wilt

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Minneapolis, MN 55438
Phone: 952-995-2000

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Vernon County Solid Waste & Recycling
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Viroqua, WI 54665

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S3705 County Road LF
Viroqua, WI 54665

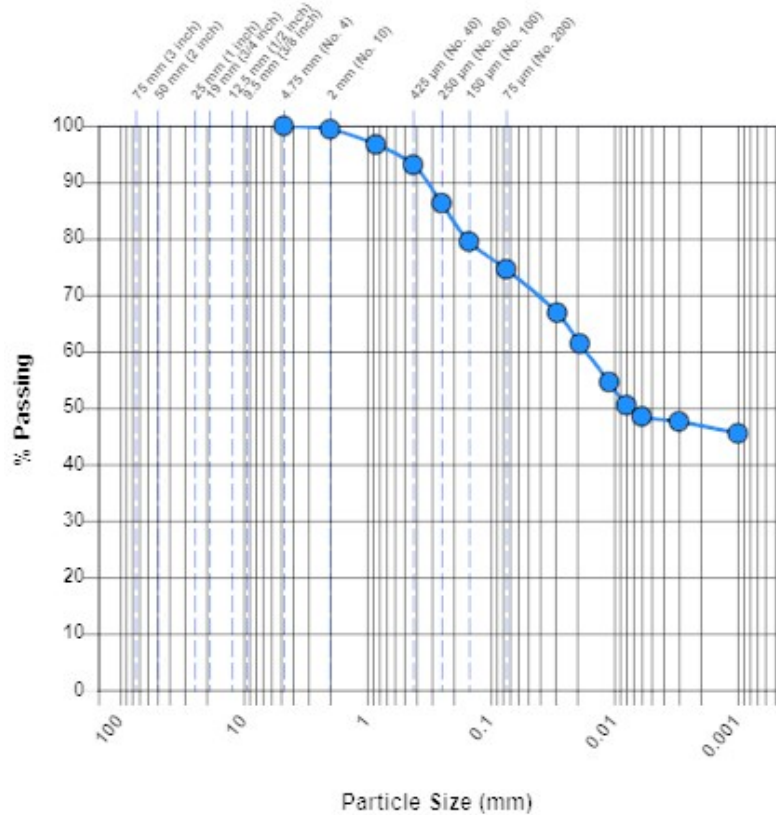
Sample Information

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
D₆₀ (µm):	17.4						

General

Bob K. Wilt

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Vernon County Solid Waste & Recycling
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Viroqua, WI 54665

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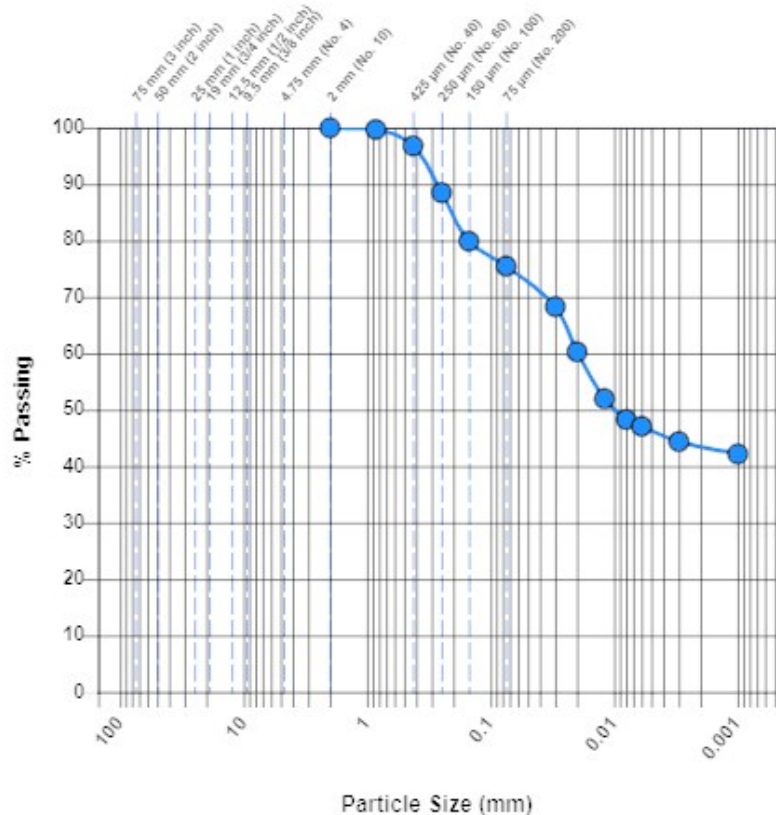
Sample Information

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
D₆₀ (µm):	19.7						

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Minneapolis, MN 55438
Phone: 952-995-2000

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Vernon County Solid Waste & Recycling
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Viroqua, WI 54665

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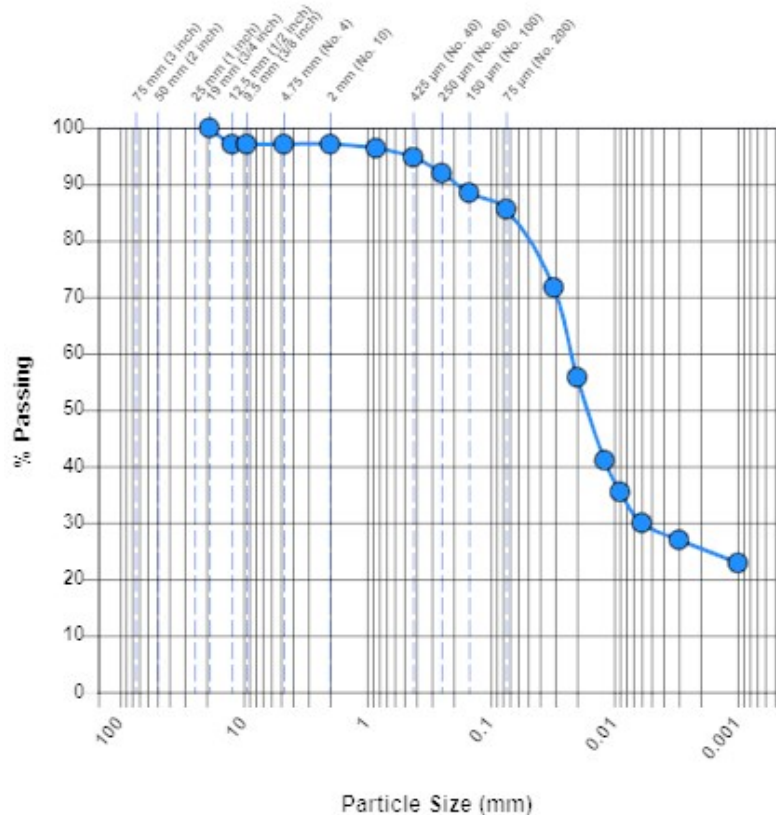
Sample Information

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
D₆₀ (µm):	22.9	D₃₀ (µm):	6.0				

General

Bob K. Wilt

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

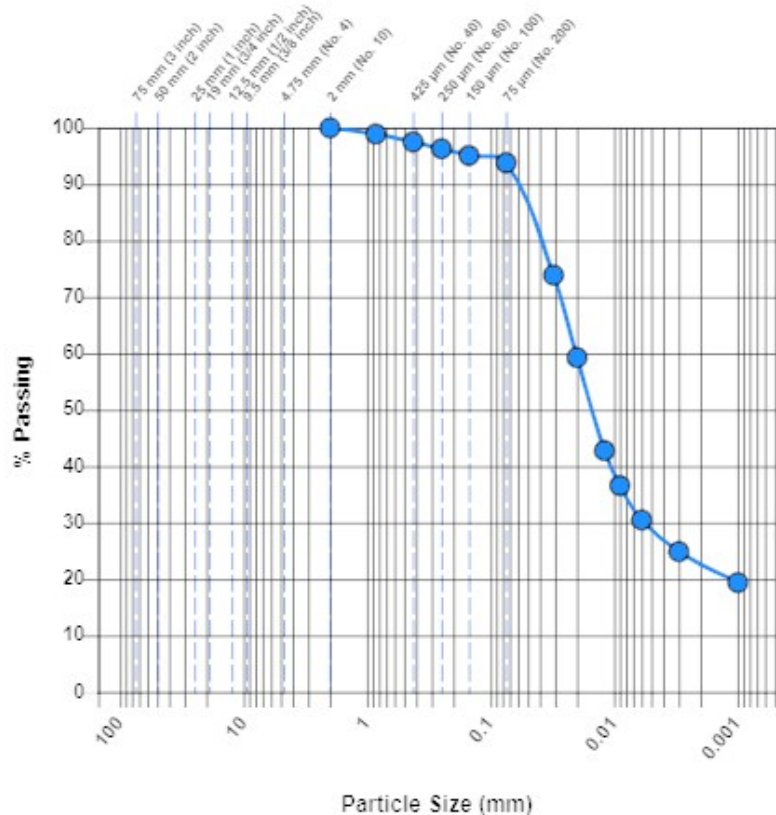
Sample Information

Sample Number:	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
D₆₀ (µm): 20.5	D₃₀ (µm): 5.7		

General

Bob K. Wilt

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

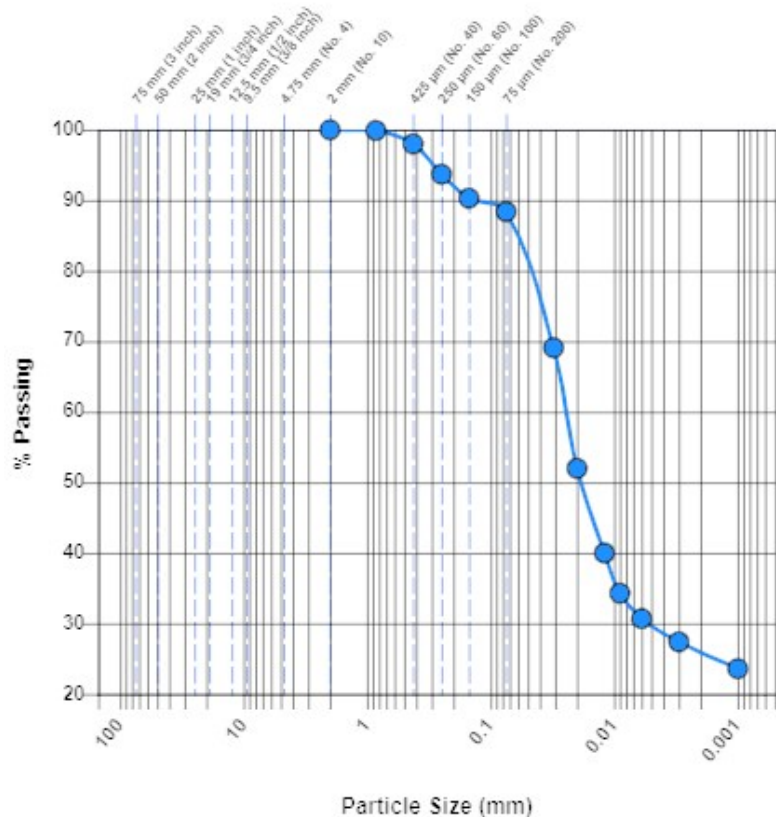
Sample Information

Sample Number:	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
D₆₀ (µm):	25.1	D₃₀ (µm):	5.4				

General

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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:

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Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

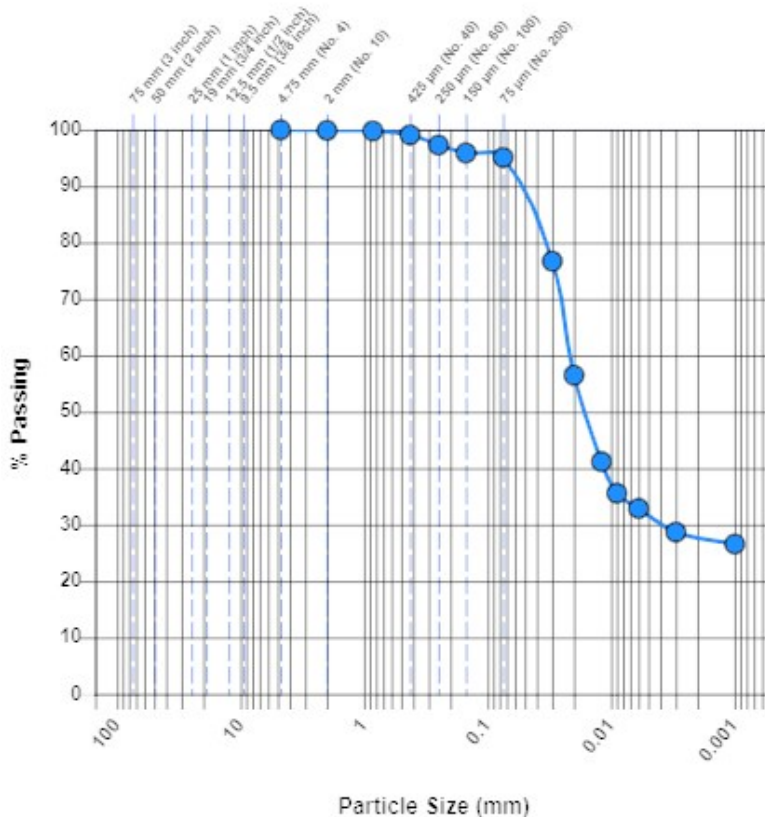
Sample Information

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
D₆₀ (µm):	21.7	D₃₀ (µm):	3.9				

General

Bob K. Wilt

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

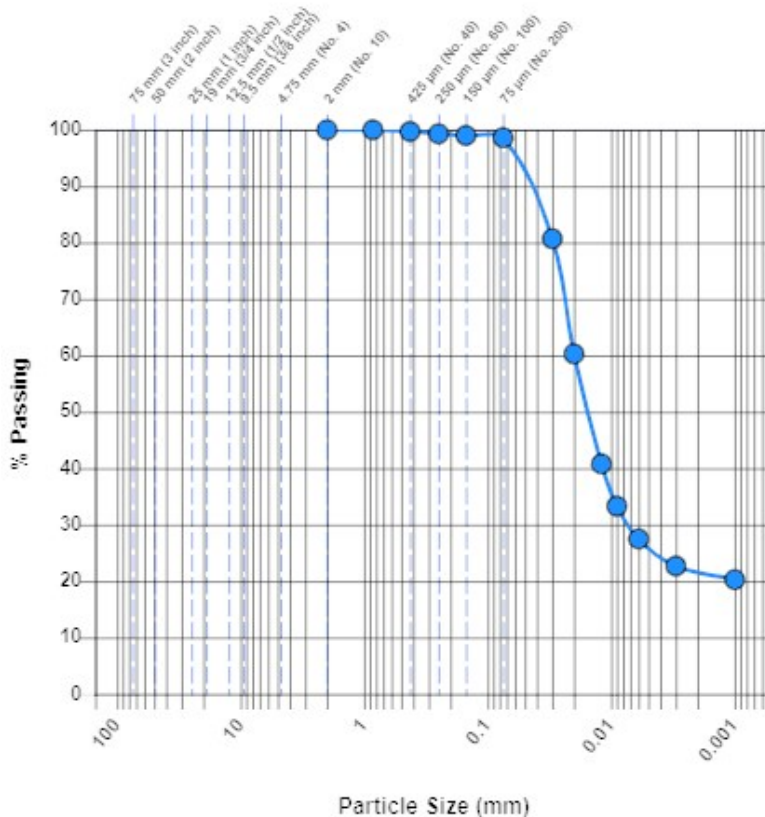
Sample Information

Sample Number:	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
D₆₀ (µm):	19.9	D₃₀ (µm):	7.3				

General

Bob K. Wilt

Standard Proctor M-D Relationship

ASTM D698

Report Date: 12/07/2022

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

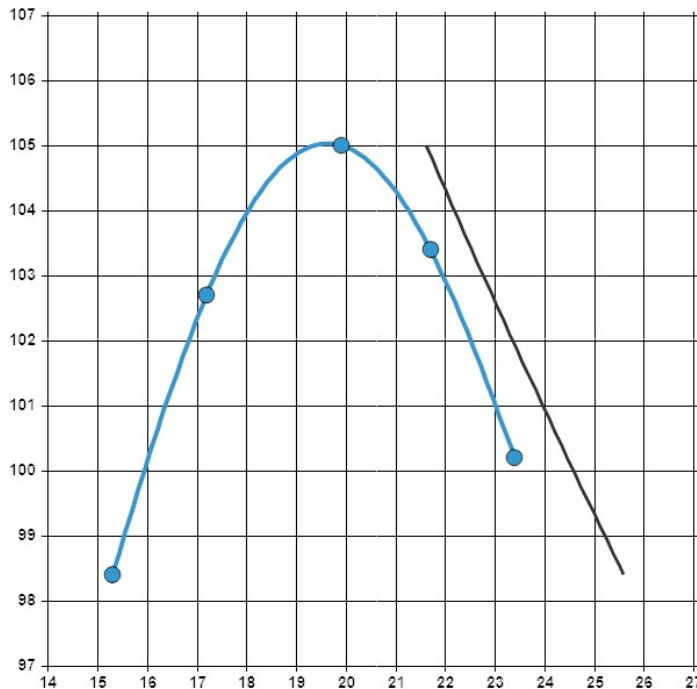
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	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.

Bob K. Wilt

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Modified Proctor M-D Relationship

ASTM D1557

Client:

Vernon County Solid Waste & Recycling
Department
S3705 County Road LF
Viroqua, WI 54665

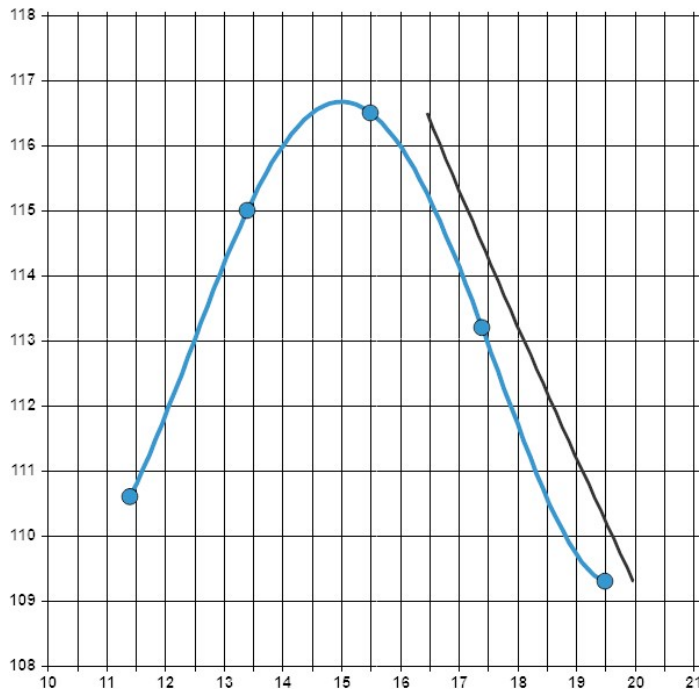
Project:

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

Remarks: The % passing the #200 is for informational purposes only.

Bob K. Wilt

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

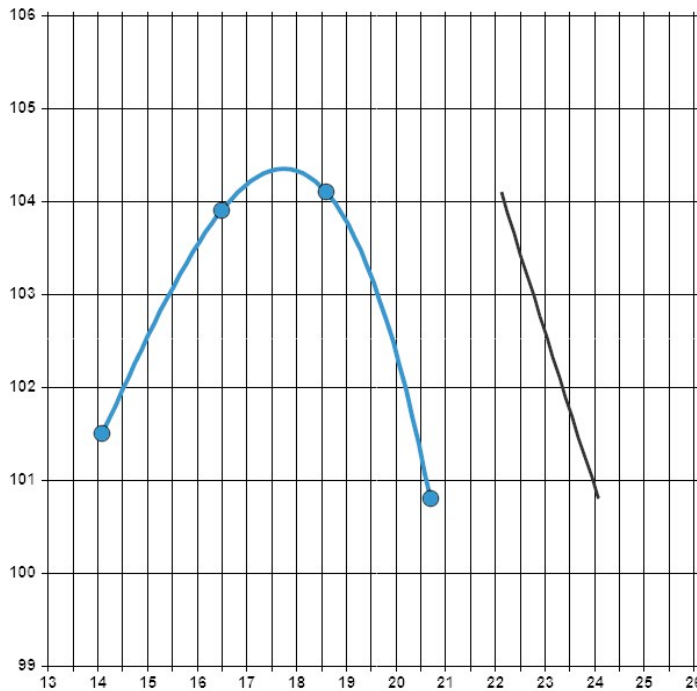
Project:

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

Remarks: The % passing the #200 is for informational purposes only.

Bob K. Wright

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

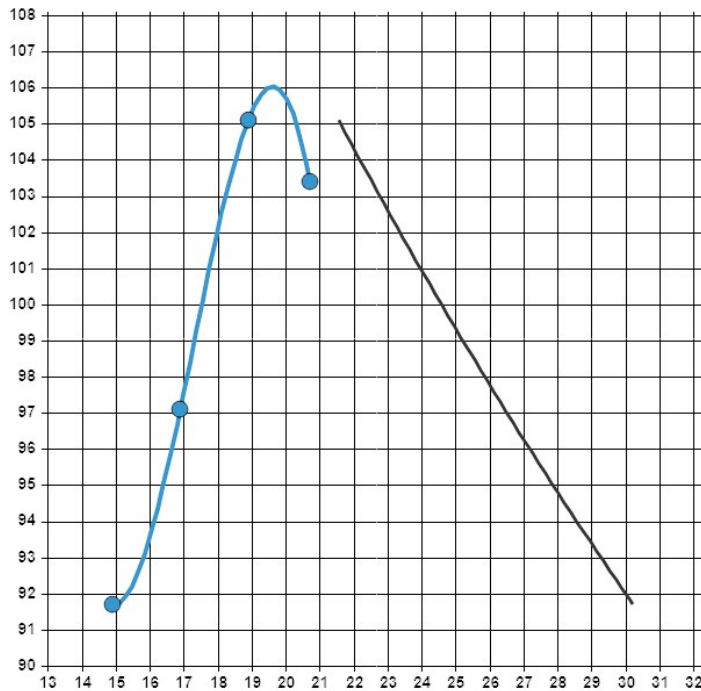
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	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

Remarks: The % passing the #200 is for informational purposes only.

Bob K. Wright

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

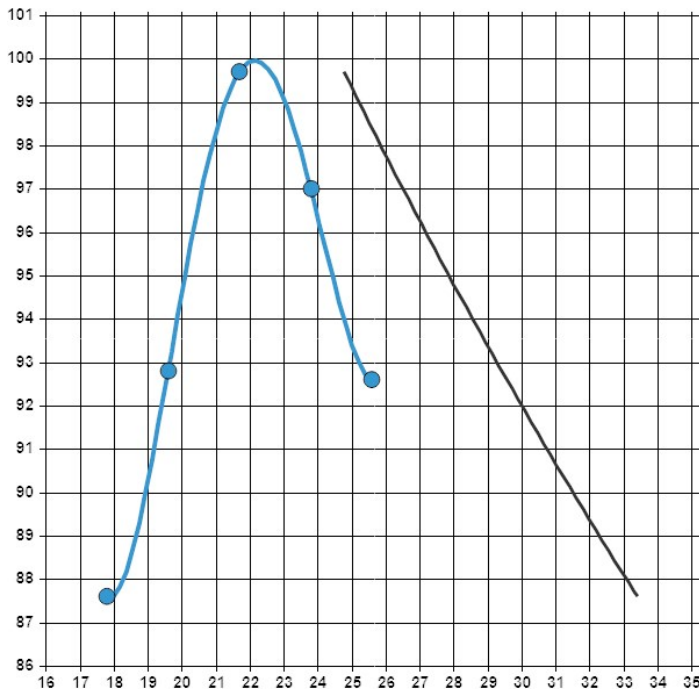
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	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

Remarks: The % passing the #200 is for informational purposes only.

Bob K. Wilt

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Modified Proctor M-D Relationship

ASTM D1557

Client:

Vernon County Solid Waste & Recycling
Department
S3705 County Road LF
Viroqua, WI 54665

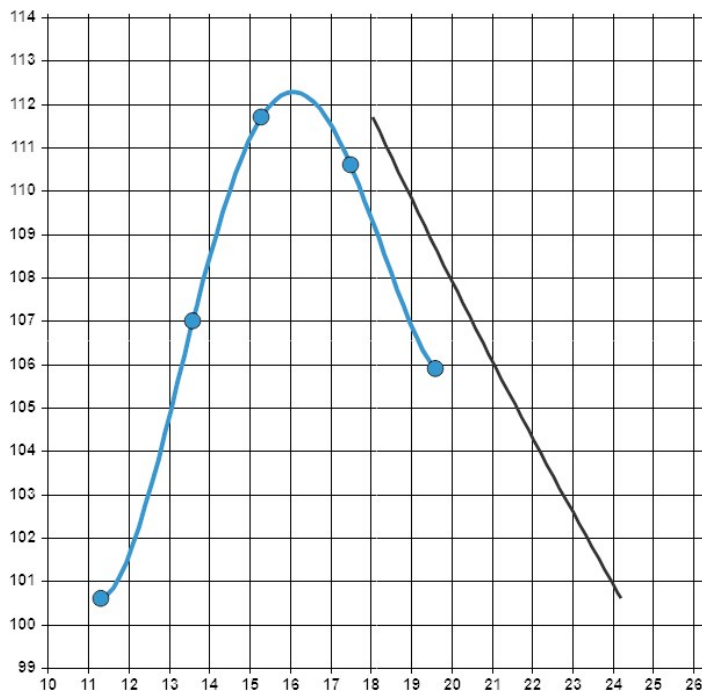
Project:

B2205032
Vernon County Landfill
S3705 County Road LF
Viroqua, WI 54665

Sample Information

Sample Number:	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.

Bob K. Wilt

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:

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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

	<u>Initial</u>	<u>Final</u>
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.

Bar K. W. J.

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

	<u>Initial</u>	<u>Final</u>
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.

Bar K. W. J.

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

	<u>Initial</u>	<u>Final</u>
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.

Bob K. Wilt

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

	<u>Initial</u>	<u>Final</u>
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.

Bob K. W. J.

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

	<u>Initial</u>	<u>Final</u>
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.

Bob K. Wilt

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

Bob K. Wright

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

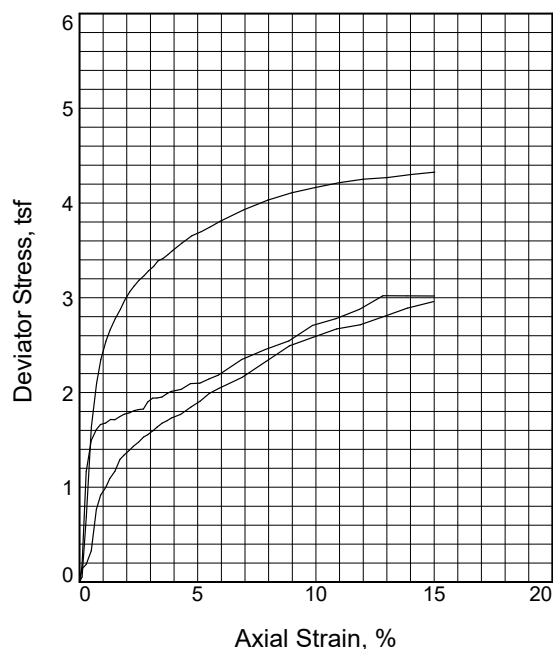
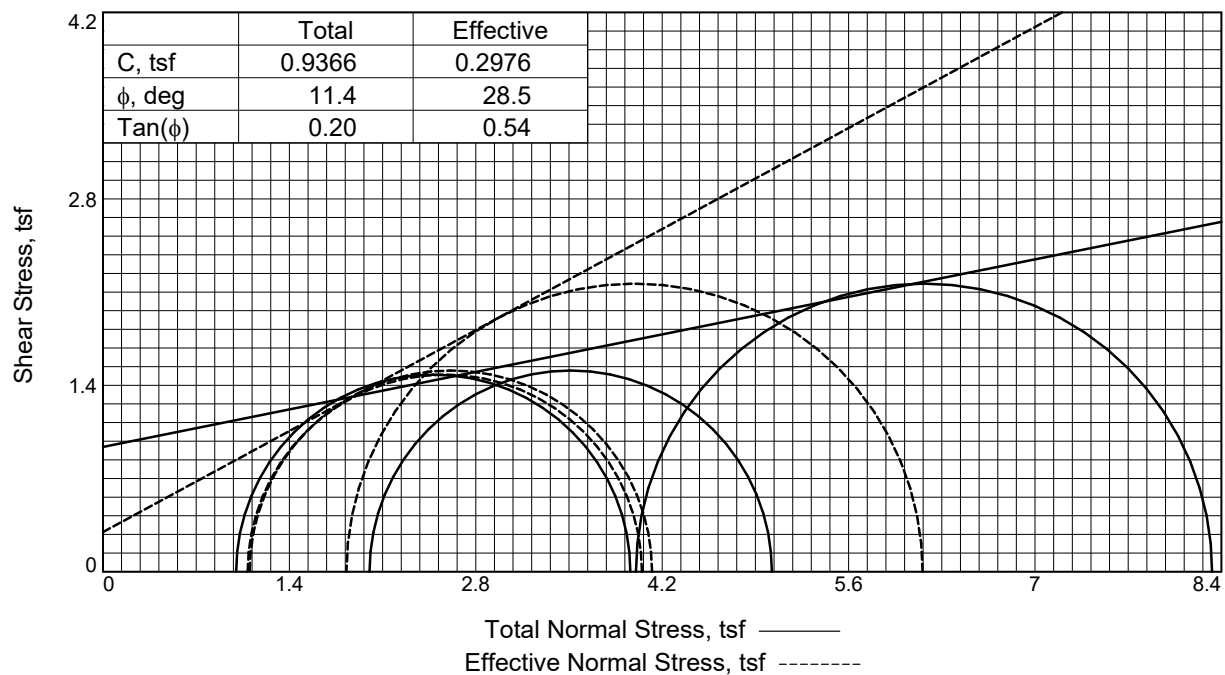
Sample Number:	522628	Depth (ft):	0-2
Sampling Method:	Project Specified	Sampled By:	Wright, Brandon
Boring Number:	B-20		
Location Details:	B-20		
Sample Date:	05/24/2023		
Received Date:	05/24/2023	Lab:	11001 Hampshire Ave S, Bloomington, MN
Tested Date:	06/08/2023	Tested By:	Streier, Jim

Laboratory Data

Soil Specific Gravity At 20 °C:	2.66
Method Used:	Method B Dry

General

Bob K. Wright



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

Client: Vernon County Solid Waste & Recycling Department

Project: Vernon County Landfill

S3705 County Road LF, Viroqua, WI

Source of Sample: MW-16

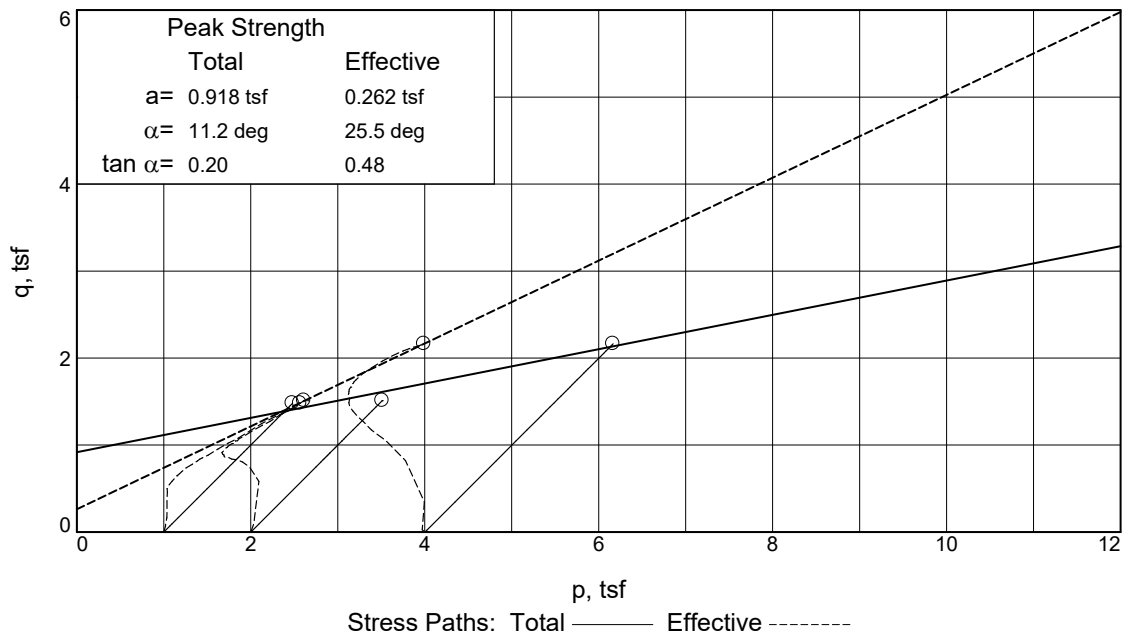
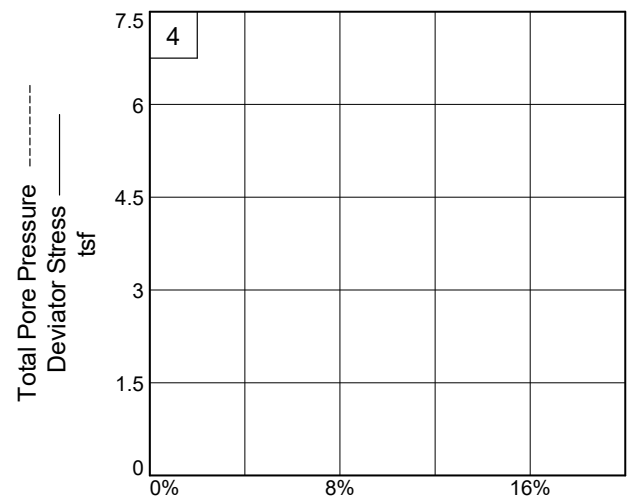
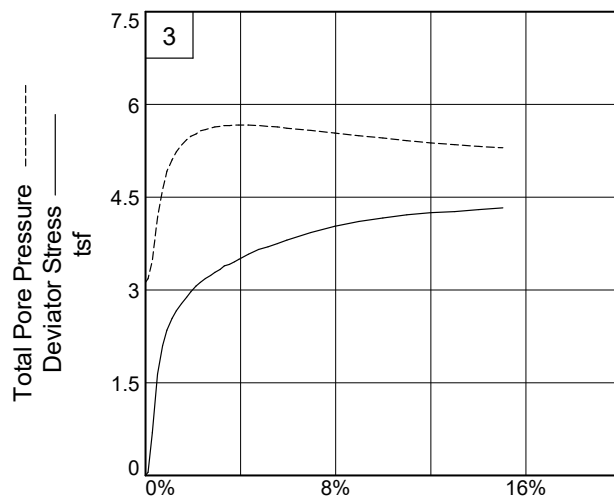
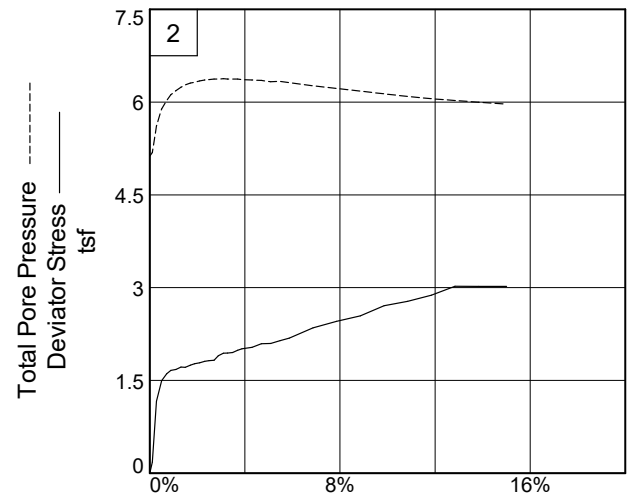
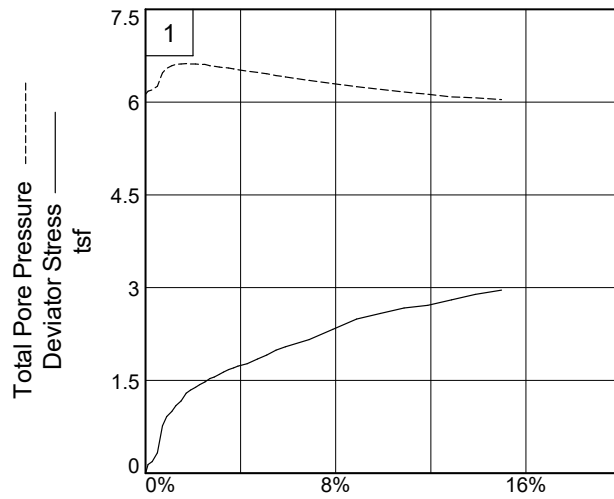
Depth: 7-9'

Proj. No.: B2205032

Date Sampled:

BRAUNSM
INTERTEC

Figure _____



Client: Vernon County Solid Waste & Recycling Department

Project: Vernon County Landfill

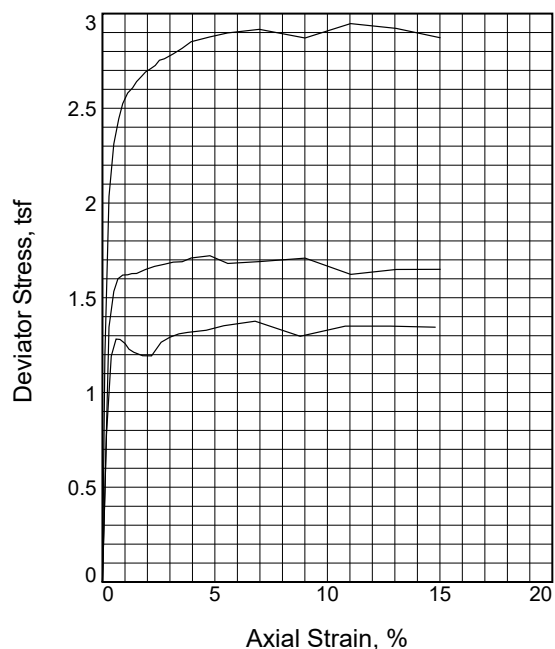
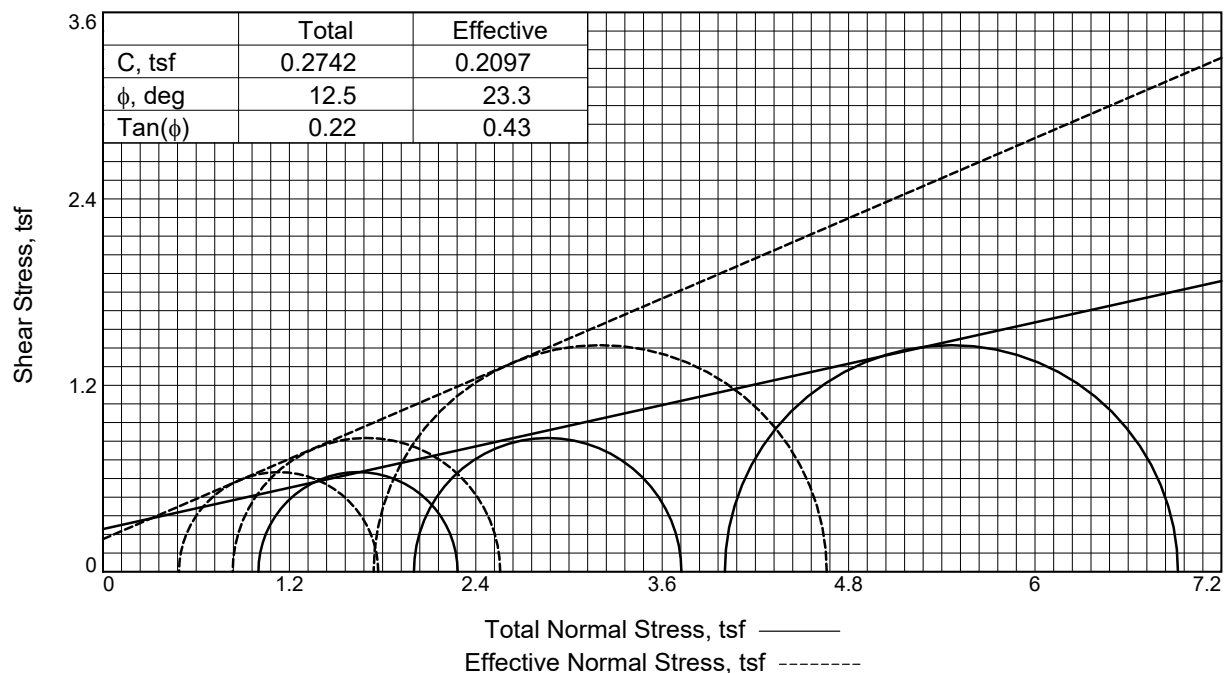
Source of Sample: MW-16

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

Client: Vernon County Solid Waste & Recycling Department

Project: Vernon County Landfill

S3705 County Road LF, Viroqua, WI

Source of Sample: B-19

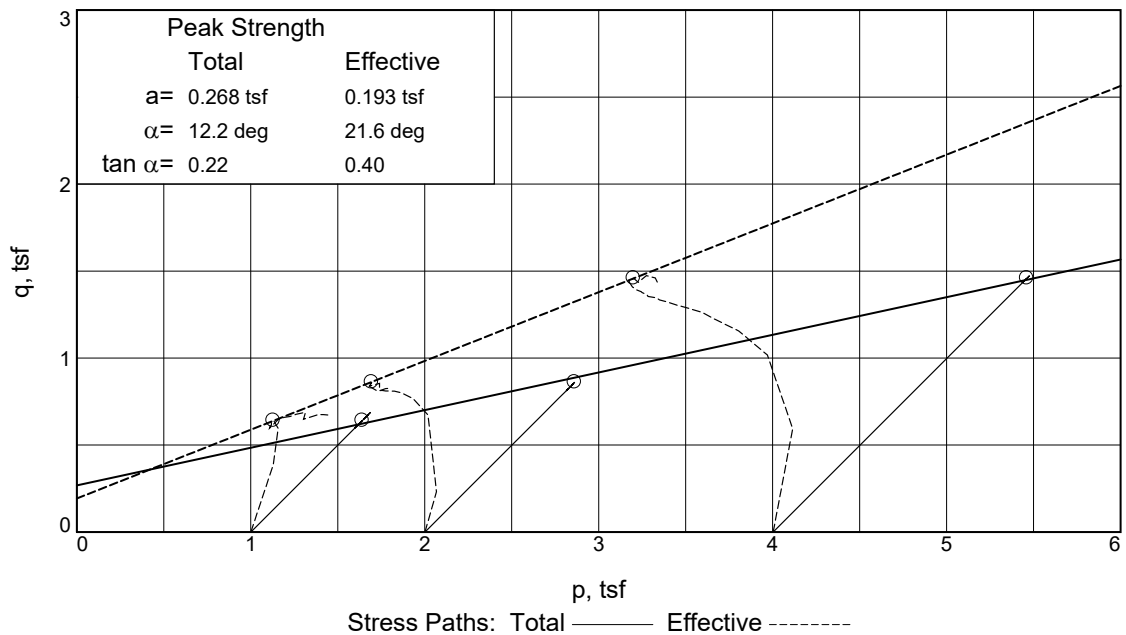
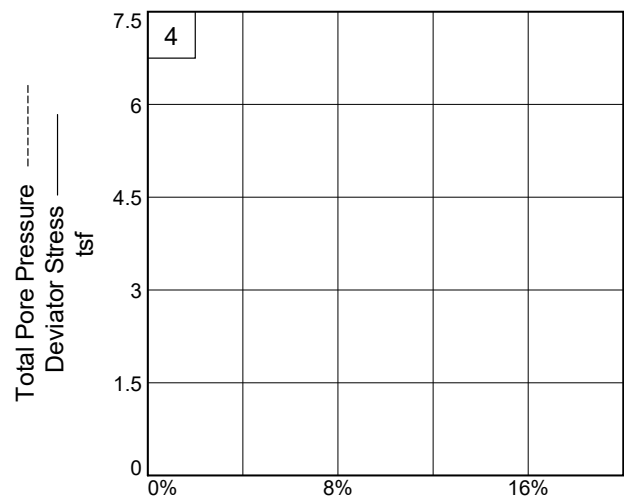
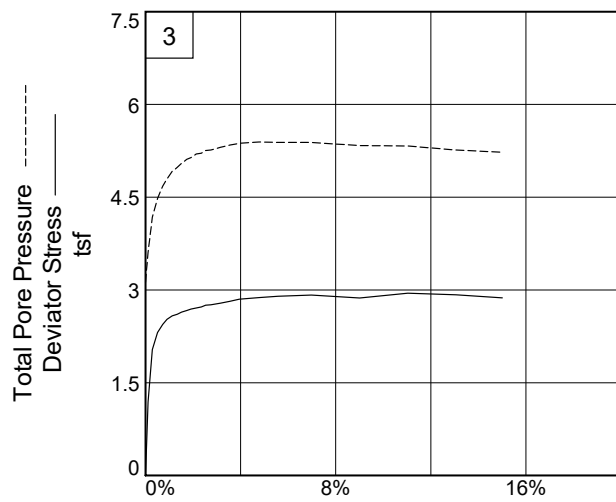
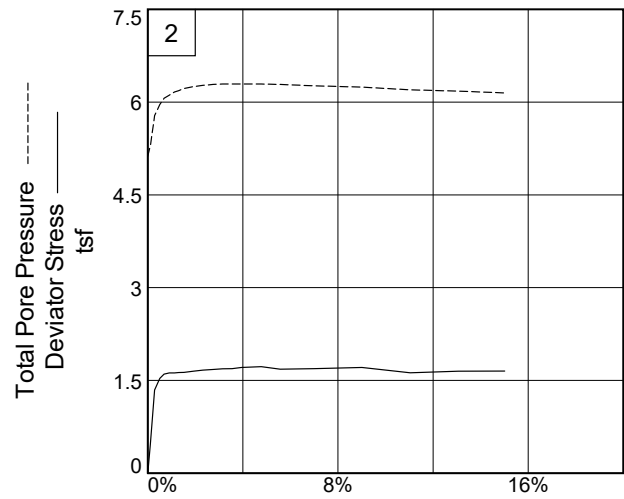
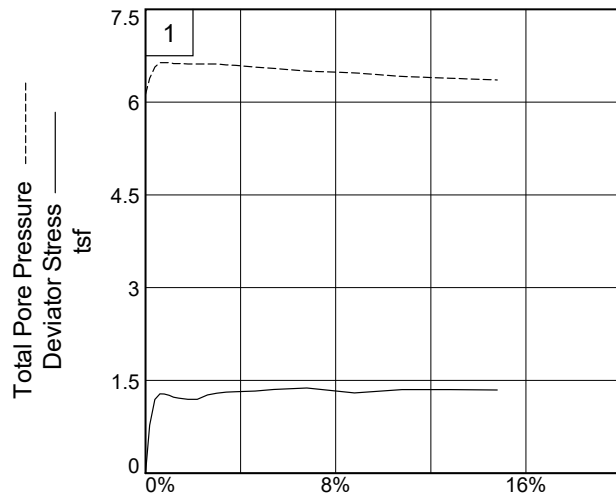
Sample Number: 522626

Proj. No.: B2205032

Date Sampled:

BRAUNSM
INTERTEC

Figure _____



Client: Vernon County Solid Waste & Recycling Department

Project: Vernon County Landfill

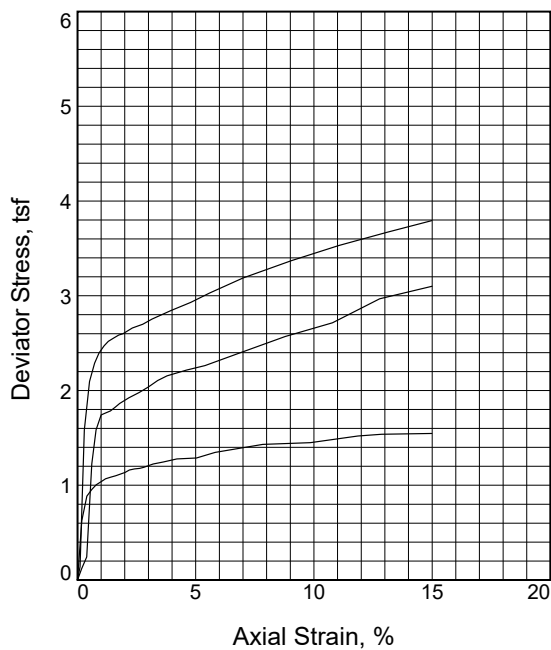
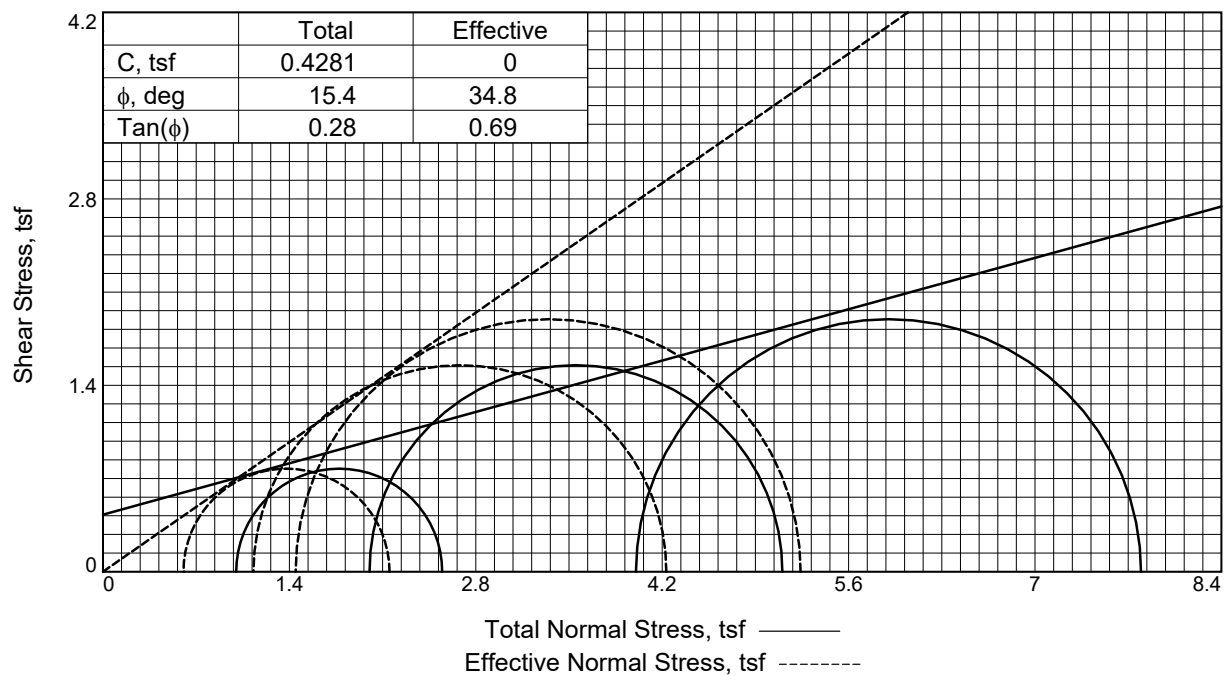
Source of Sample: B-19

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

Client: Vernon County Solid Waste & Recycling Department

Project: Vernon County Landfill

S3705 County Road LF, Viroqua, WI

Source of Sample: B-20

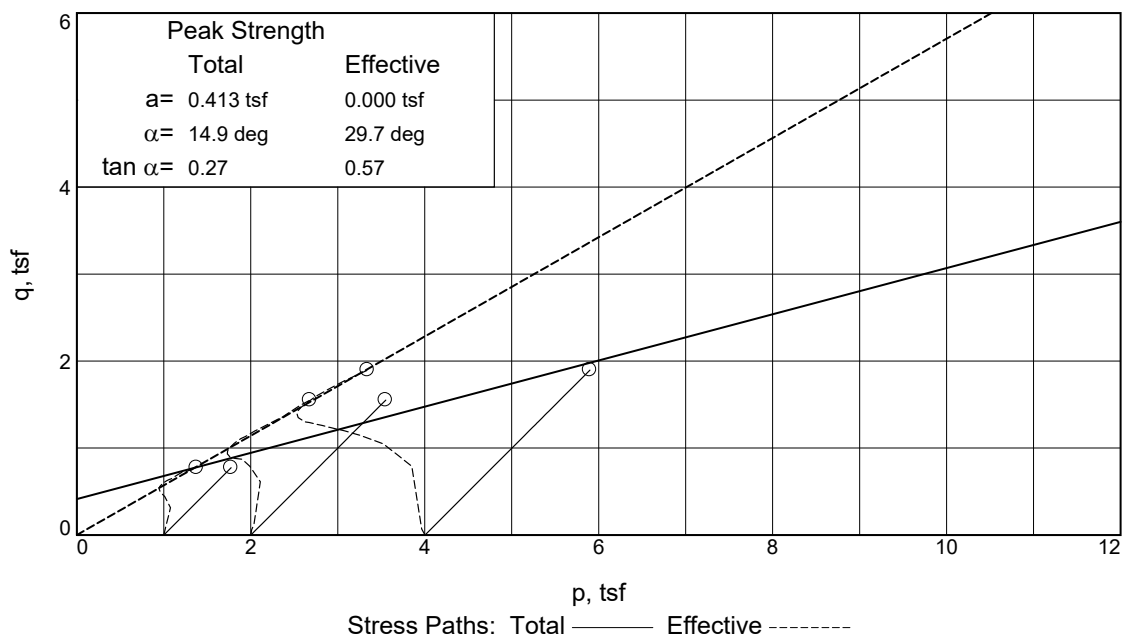
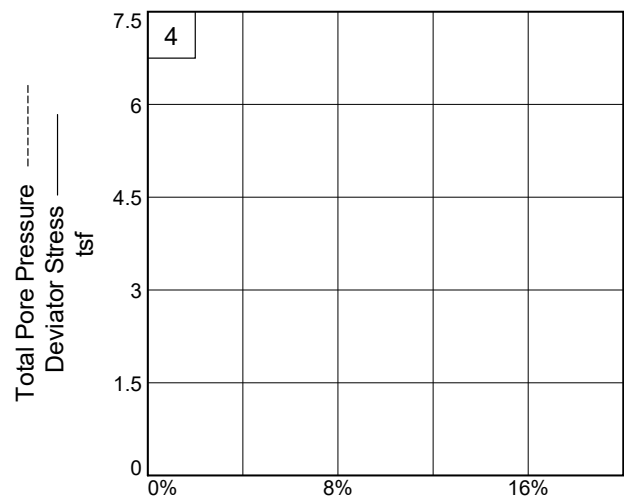
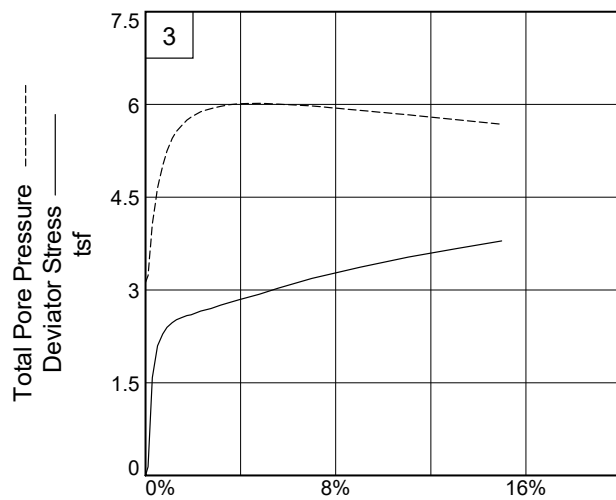
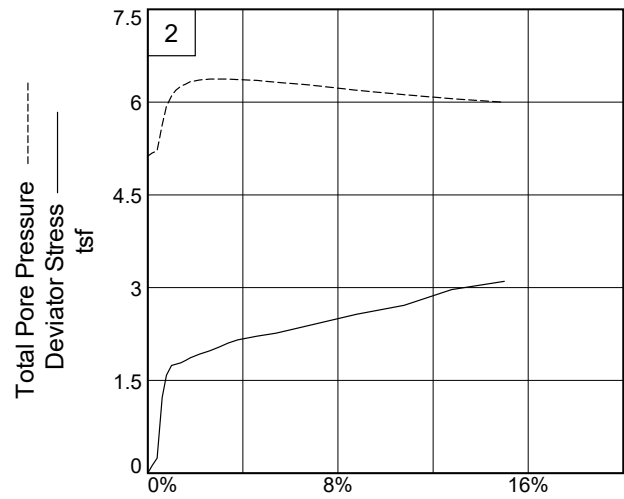
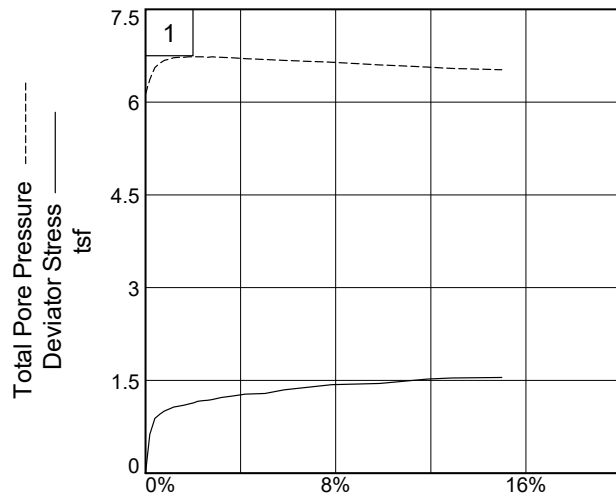
Sample Number: 522628

Proj. No.: B2205032

Date Sampled:

BRAUNSM
INTERTEC

Figure _____



Client: Vernon County Solid Waste & Recycling Department

Project: Vernon County Landfill

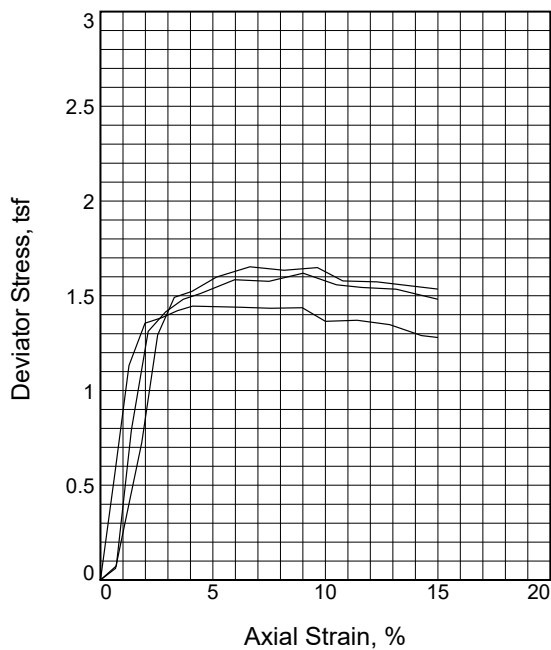
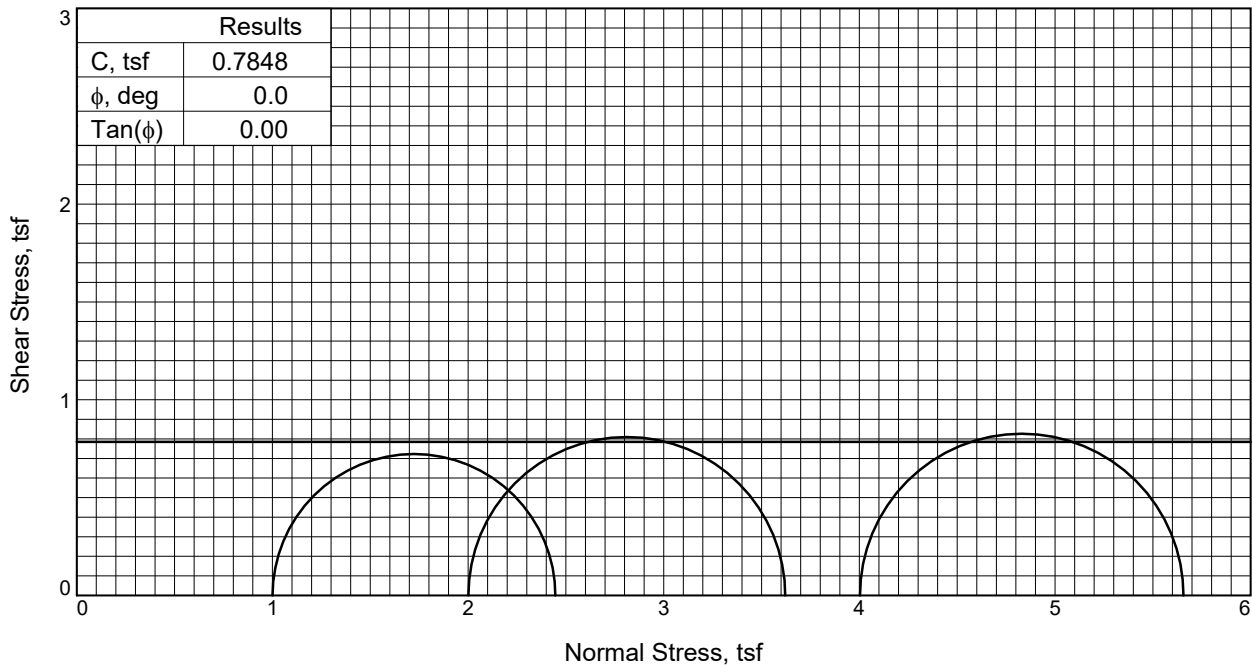
Source of Sample: B-20

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

Client: Vernon County Solid Waste & Recycling Department

Project: Vernon County Landfill

S3705 County Road LF, Viroqua, WI

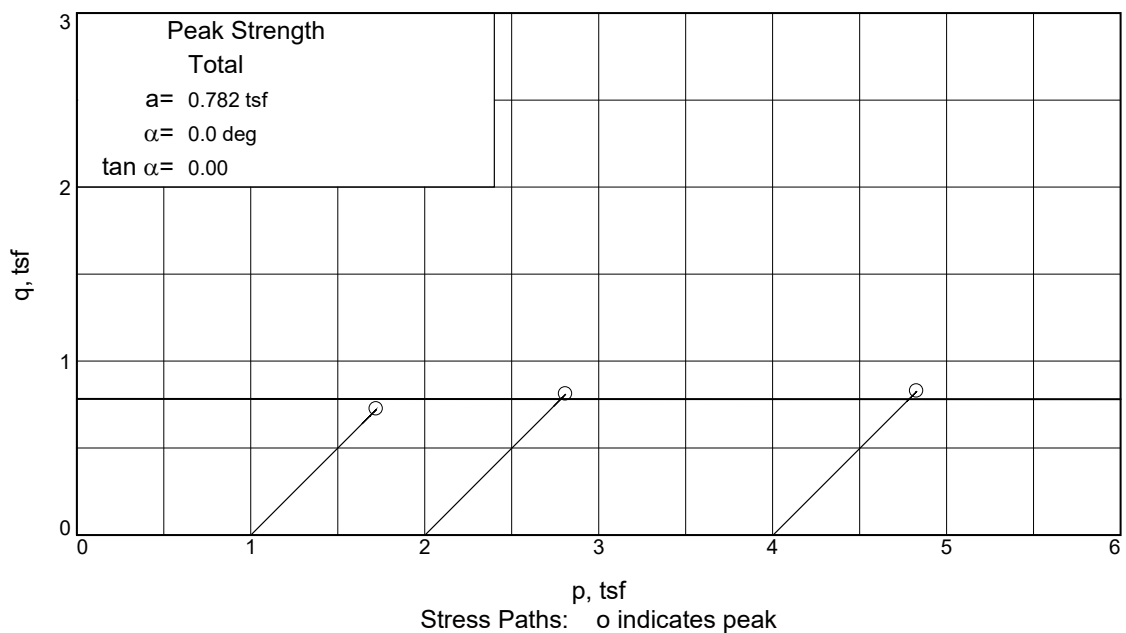
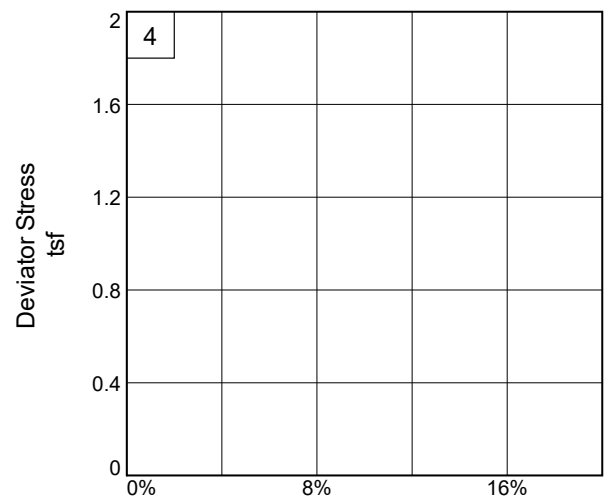
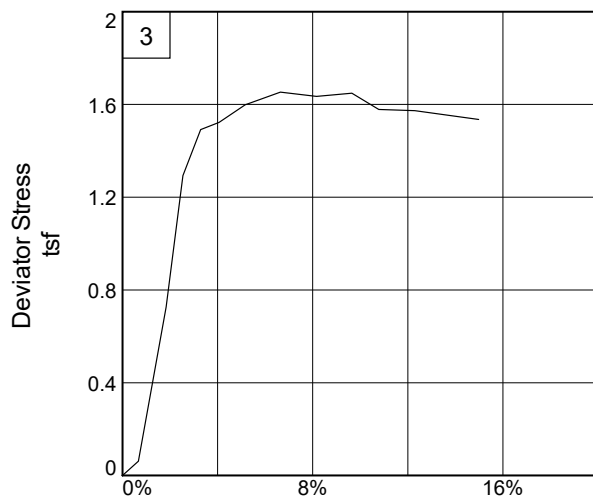
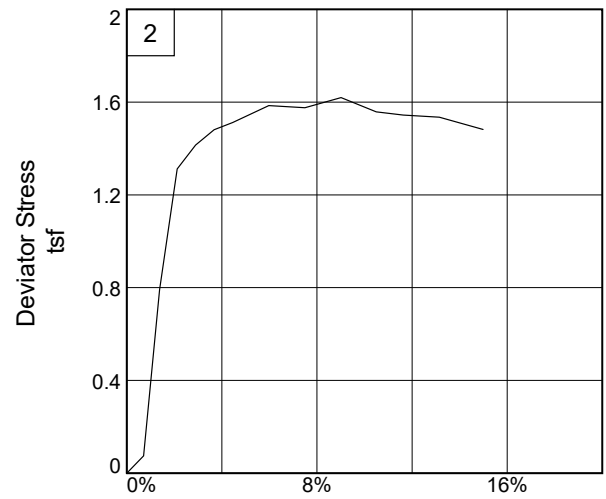
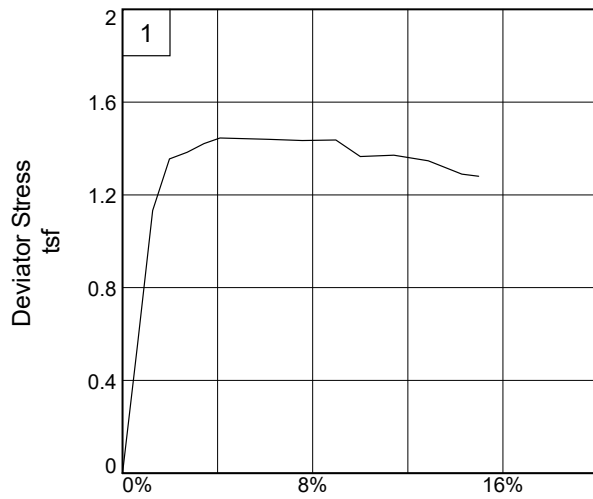
Source of Sample: B-19

Proj. No.: B2205032

Date Sampled:

BRAUNSM
INTERTEC

Figure _____



Client: Vernon County Solid Waste & Recycling Department

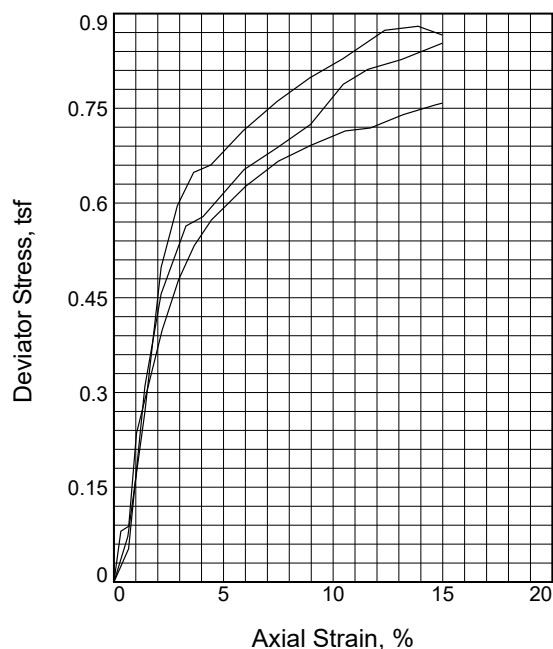
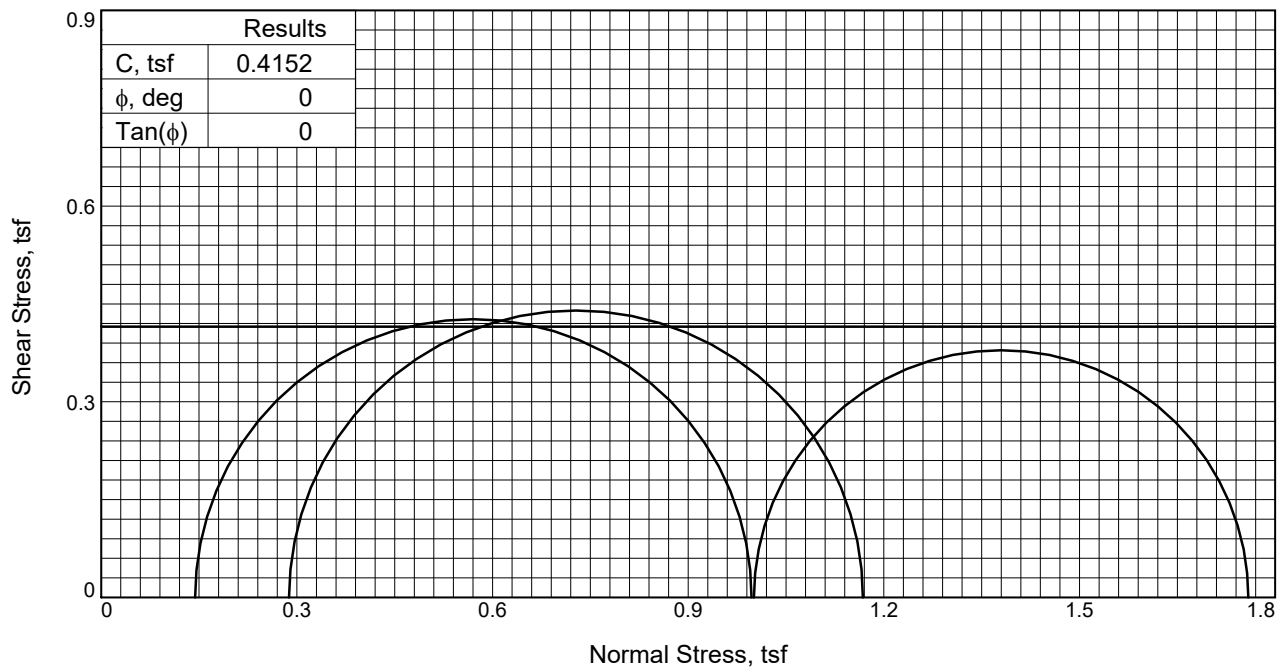
Project: Vernon County Landfill

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

Client: Vernon County Solid Waste & Recycling Department

Project: Vernon County Landfill

S3705 County Road LF, Viroqua, WI

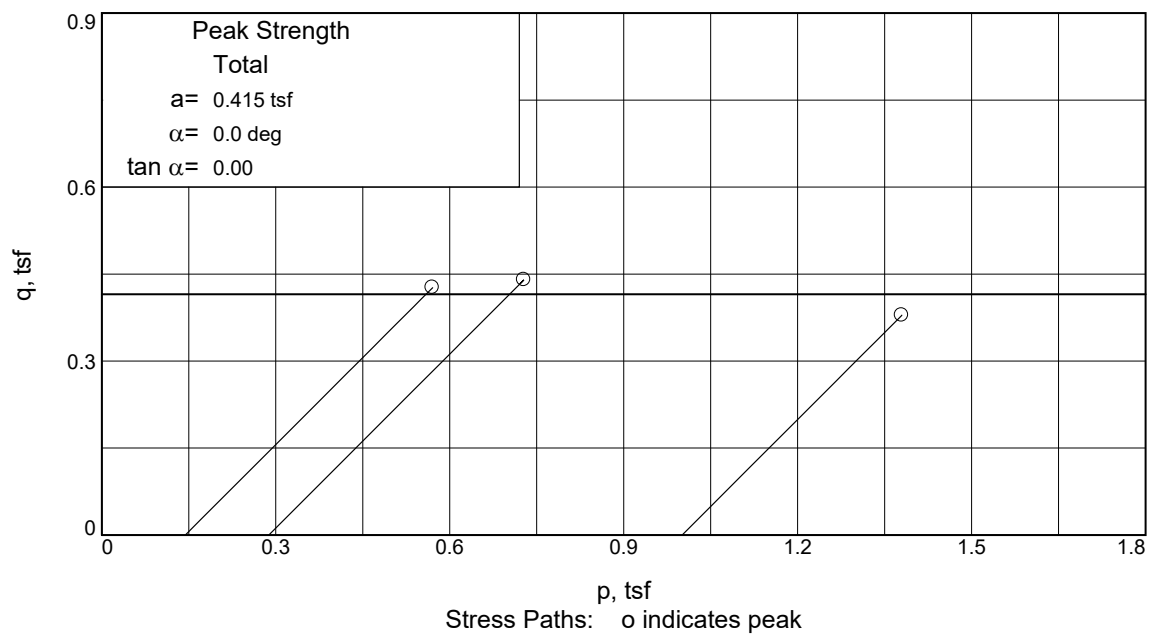
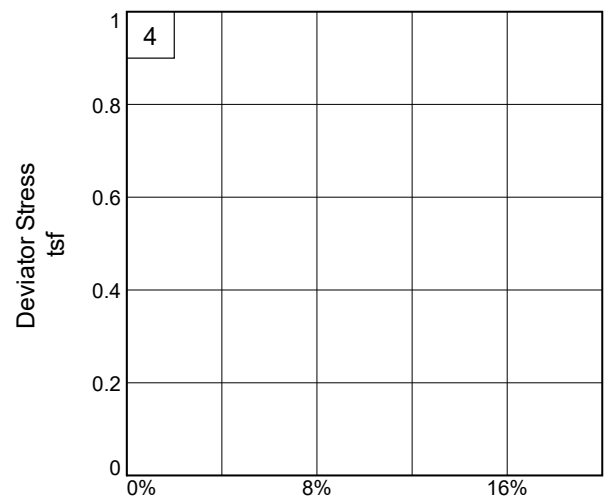
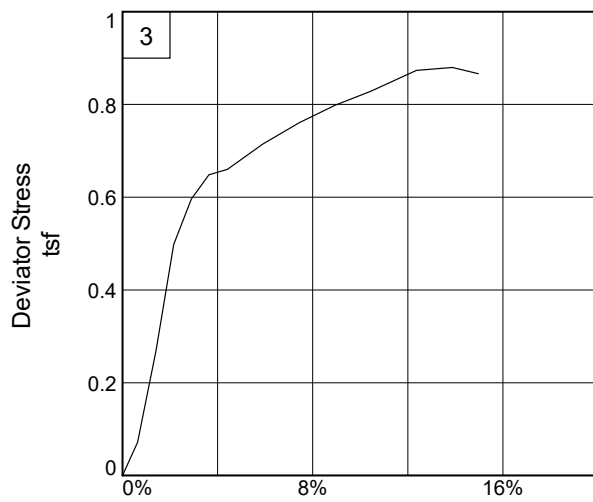
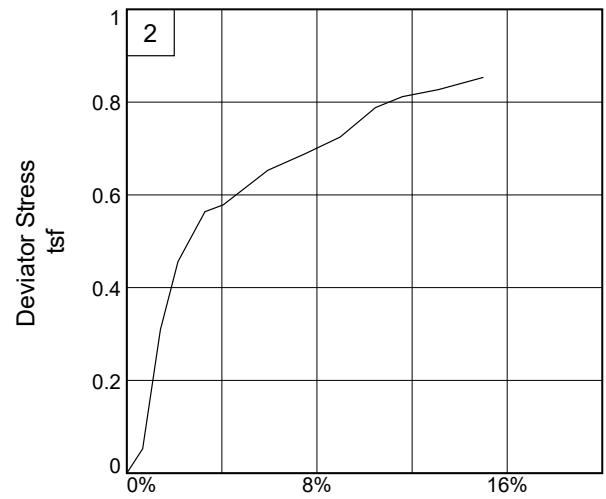
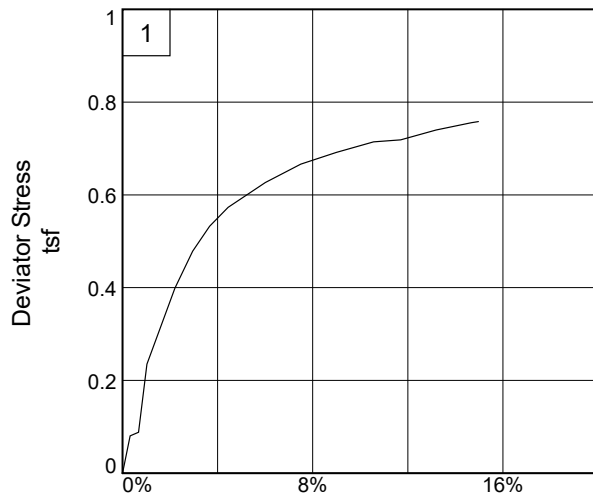
Source of Sample: B-20

Proj. No.: B2205032

Date Sampled:

BRAUNSM
INTERTEC

Figure _____



Client: Vernon County Solid Waste & Recycling Department

Project: Vernon County Landfill

Source of Sample: B-20

Project No.: B2205032

Figure _____

Braun Intertec