11228 Aurora Avenue
Des Moines, Iowa 50322-7905
United States
www.ghd.com

Our reference: 056934-LTR-22

February 14, 2025

Mr. Brian Rath
Iowa Department of Natural Resources
Wallace State Office Building
502 E. 9th Street
Des Moines, Iowa 50319

Response to Comments
Operating Permit No. 07-SDP-12-89 Renewal Application
Viking Pump Foundry Sand Landfill, Cedar Falls, Iowa

Dear Mr. Rath:

This letter was prepared in response to the Iowa Department of Natural Resources' (IDNR's) comments provided in an email dated December 24, 2024 from Mr. Brian Rath. The comments were related to the June 17, 2024 document: Permit Renewal Application. The attachments associated with the application submittal are provided in addition to this letter.

For clarity, IDNR's comments are set forth below in bold type, followed by GHD's responses.

1. Response to Comments

Comment 1

Baghouse Dust - DOP (Page 20 of the PDF). Section 1.1 states that you are proposing to dispose of baghouse dust. Per the rules, additional information is needed with a request to landfill a waste stream. Please provide this information.

GHD Response:

The TCLP analysis for baghouse dust samples is provided in Appendix B of the accompanying revised Design and Operations Plan (DOP) dated February 14, 2025. The "Amtech BH" sample included in this analysis is drummed and sent out to a TSDF and does not go to the landfill.

Comment 2

Baghouse Dust - DOP (Page 21 of the PDF). The operations are described in Section 3.3 by saying the baghouse dust will be "directly" covered. Please clarify what the intent of "directly" is (i.e. immediately following waste placement). See also ERRAP Baghouse Dust comment below.

GHD Response:

Section 3.3 of the DOP has been updated to replace “directly” with “immediately.” The use of “directly” was meant to convey that immediately after placement of the baghouse dust in the landfill, the baghouse dust will be covered with foundry sand. The intent is to continue disposing of baghouse dust waste at the Black Hawk County Landfill and only enact this procedure when Viking can immediately cover the baghouse dust, as the contractor that crushes and compacts foundry blocks is not on site every day. In other words the baghouse dust will only be placed when the contractor is on site to crush and place sand.

Comment 3

TCLP—DOP (Page 21 of the PDF). It is unclear if the TCLP in Appendix B is for the baghouse dust or the TCLP the DNR previously requested for the foundry sand, as stated in this paragraph. However, based on other information in the document, it appears it is a TCLP for the baghouse dust. Please discuss why only metals were analyzed.

GHD Response:

TCLP samples for baghouse dust and foundry sand are provided in the accompanying revised DOP.

Comment 4

Liner protection - DOP (Page 21 of of the PDF). It is stated that the north side of the landfill has portions without 3 feet of sand. The DNR is concerned about the impact on this area's liner and drainage layer, considering it has been uncovered for 10 years. Therefore, the DNR requests an action plan, including a schedule, to perform an evaluation to verify the integrity of the liner and leachate collection system in this area, provide recommendations for any repairs, and provide a timeframe for placing 3 feet over this area.

GHD Response:

The liner has remained under minimum 1 ft to 3 ft in depth of material since the initial construction in 2014. The original permit application documents documented the engineering and reasoning for this with questions from DNR personnel approving and reviewing the application at the time. The GCL and overburden were proposed and the DNR personnel approved the design. The design documentation is provided in the 2015 Permit Renewal Application (Doc #82755). For references to GCL and liner design see specifically pages 26, 107, 251, 252, 254.

Viking is willing to perform a liner integrity evaluation if after review of the above documents, the DNR would still like Viking to proceed. The evaluation of the liner integrity of the north portion can occur in April 2025 or in October 2025 when either Semiannual Inspection is conducted, if acceptable to the DNR. A meeting with DNR on site can be scheduled to discuss the condition of the liner and steps moving forward. Photographs showing this upper area over the last several years are attached. The exposed membrane observed at the crest of the slope is a piece of sacrificial liner overlapping membrane and not the underlying cover This detail can be seen in Section H on sheet CI-09 of the 2015 Permit Renewal Package (page 252 of Doc #82755).

Comment 5

ERRAP Baghouse Dust (Page 83 of the PDF). It is stated that the baghouse dust may be sprinkled to control dust. However, this is not stated in the DOP. Please correct this omission and provide more detail on the operational procedures for placing this material, including preventing runoff, etc.

GHD Response:

Section 2.4.6 of the accompanying revised ERRAP, dated February 14, 2025, has been updated to be consistent with the DOP.

Comment 6

ERRAP Offsite Releases (Page 83 of the PDF). Section 2.4.8 states there won't be offsite releases, but 2.6 states that there may be. It is suggested to refer 2.4.8 to 2.6.

GHD Response:

Section 2.6 of the accompanying ERRAP, dated February 14, 2025, has been updated to indicate mass movement events are not expected to result in an offsite release.

2. Closing

Should you have any questions or comments, please call me at (515) 414-3934.

Regards,

Michael Alowitz
Project Director
+1 515 414-3934
michael.alowitz@ghd.com

Margaret Zuckweiler
Project Manager
+1 612 524-6843
margaret.zuckweiler@ghd.com

MA/ls/LTR-22

Copy to: Evan Arachikavitz, Viking (via email)
Mary Grace Armbrust, GHD (via email)

Site Photographs

Photo 1 ***10/14/2016.*** **North area and back side of landfill, looking northeast.**

Photo 2 ***4/19/2017.*** **Top of landfill, looking southwest.**

Photo 3 ***4/24/2018.*** **Top of landfill, facing east.**

Photo 4 ***4/19/2019.*** **Top of landfill viewed from the northeast corner looking southwest.**

Photo 5 ***4/8/2020.*** **North area of landfill, looking west.**

Photo 6 ***10/7/2021.*** **North area and back side of landfill, facing west.**

Photo 7 ***4/13/2022.*** **Top of landfill, facing west from the northeast corner.**

Photo 8 ***10/2/2023.*** **North area of landfill, looking west.**

Photo 9 ***4/1/2024.*** **North area of landfill, facing west, showing exposed membrane (not part of the cover).**

Photo 10 ***10/10/2024.*** **Top of landfill, looking west from the northeast corner.**

Design and Operations Plan

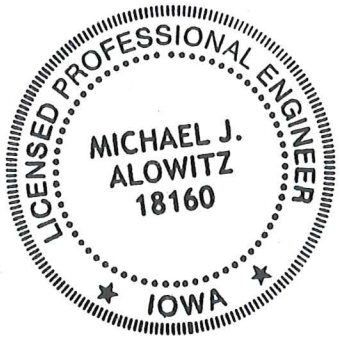
Permit No. 07-SDP-12-98 Renewal Application

IDEX Corporation

February 14, 2025

→ The Power of Commitment

Certification



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Michael J. Alowitz, P.E. — Date: 2/14/25

License Number: 18160

My license renewal date is: December 31, 2026

Pages or sheets covered by this seal: Entire Document

Contents

Appendices

1. Introduction

Viking Pump, Inc. (Viking) operates a Foundry and Foundry Sand Landfill (Landfill) located in the SW 1/4, of the SW 1/4 of Section 22, Township 89 North, Range 14 West in Black Hawk County, Iowa. The Landfill location is shown on drawing C-001 in Appendix A. This Design and Operational Plan for the Landfill was prepared by GHD Services, Inc. (GHD) for Viking Landfill operators and their waste filling contractor.

The Landfill has been used as a disposal area exclusively for foundry waste streams generated by Viking which include green sand, isocure chemically bonded sand and no-bake sand. The site was undeveloped prior to use as a Landfill. The Landfill operated as an unlined industrial landfill until 2014 when the unlined portion of the Landfill was closed and capped. Current operations have foundry sand being placed in lined areas with leachate collection. The cap of the initial industrial Landfill serves as a lined cell to place additional foundry sand. Existing conditions of the Landfill are shown on drawing C-051 in Appendix A and based on the data obtained from the survey conducted on October 27, 2021.

1.1 Purpose of this document

Landfill operational requirements are also included in this document. The drawing set included as Appendix A can be used to inform Viking's waste filling contractor of the planned fill pattern.

Viking is proposing to dispose of baghouse dust in the landfill when appropriate and safe to do so; the volume per year of this material is less than 30 tons and will be managed to limit airborne dust particles.

1.2 Scope and limitations

This Design and Operations Plan was developed based on information provided by Viking and an aerial survey completed October 2021. Operational changes at the Foundry will impact the waste sand production rate and subsequently the deposition rate. Removal and reuse of material from the Landfill is not included in this document.

1.3 Assumptions

In preparation of this document, it was assumed the future deposition rate is consistent with recent projections and waste deposited has consisted only of the materials presented in Section 1.

2. Landfill Design

The Construction Documentation Report for the Landfill expansion back in 2014 was submitted as Doc 81938. The Landfill was designed to divert surface water around the fill area as shown in drawings C-051 through C-104 where surface water drains to either the stormwater basin south of the Landfill or into the unnamed creek northwest of the Landfill. The leachate collection system (LCS) was installed during the Landfill expansion. More detail on the LCS is provided in Section 3.6 of this Design and Operational Plan.

Drawings in Appendix A shown the development plan over periods of five (5) and ten (10) years based on the fill rates determined using the 2021 survey data. The slope stability analyses provided in Doc 82755 remain applicable.

3. Landfill Operations

This section covers general practices and information for management of the Landfill.

3.1 Operator Certification

Viking employees certified as landfill operators by IDNR are Randy Hansen and Evan Arachikavitz. There is at least one (1) sanitary landfill operator on duty during all hours of operation of the Landfill. Certification records are maintained at the Foundry. Viking is responsible for renewing operators' certifications as required.

3.2 Non-acceptable Wastes

The following lists the wastes not acceptable in the landfill. No disposal of the following will be permitted:

- Municipal solid waste;
- Demolition and construction debris;
- Sewage sludge;
- Free liquids or waste containing free liquids and;
- All industrial wastes except foundry sand and bag house dust.

Toxicity characteristic leachate procedure (TCLP) test results are provided for baghouse dust (Appendix B) and foundry sand (Appendix C). Neither material exhibits hazardous characteristics.

3.3 Solid Waste Unloading

Waste foundry sand will be unloaded in the Landfill only when an operator is on duty at the Foundry. Foundry sand placement will be within the active waste deposition limit marked by orange cones placed on the Landfill cell perimeters, also represented as the black dotted line on drawings C-051, C-101, C-102, and C-103. The following guidelines shall be followed to protect the liner, reduce erosion potential, and not pollute groundwater or surface waters:

- Placement of the foundry sand within the Landfill, will occur immediately adjacent to the access road. As waste foundry sand is produced, facility personnel will drive equipment on the access road and place waste material adjacent to the access road. Once filling is above the grade of the access road, the access road will require rerouting.
- The access road will be all weather construction, consisting of clean and compacted stone, geotextile fabric and/or geogrid, and foundry sand layers, and maintained in good condition. Dust shall be controlled on access roads by use of various techniques (e.g. water) as required. See details on drawing C-105 in Appendix A.
- A general positive grade of 5 percent over the surface of the landfill will be provided to meet the requirements of 115.26(1) "f" to minimize flow of surface water. However, foundry sand is very porous and readily allows infiltration. Ponding in waste areas is infrequently longer than a few hours after a rain event. Ponding does occur during/after snow melt and will be managed by the positive slope.
- As the Landfill areas are filled, a qualified contractor, familiar with liner requirements will crush and grade the waste sand placed. Baghouse dust will be disposed of and then immediately covered with the foundry sand waste to minimize airborne movement of the material. Water may be sprinkled on baghouse dust if necessary to control dust during cover operations. Appendix C includes a TCLP showing the foundry sand waste is non-hazardous.
- The qualified contractor will not drive on the foundry sand protective layer unless low ground pressure equipment is used or minimum of 3 ft of sand is placed. Currently the only area of the Landfill without a minimum of 3 ft of sand are portions of the north side of the Landfill.
- Disposal of baghouse dust may occur in the Landfill, or it may be transported to the Black Hawk County Landfill.

– The qualified contractor will minimize turning or spinning heavy equipment to minimize liner damage (where necessary) during waste grading.
– Areas along slopes where foundry sand is eroded or moved may require more attentive waste placement, crushing and grading and in extreme cases, replacement of the foundry sand.
– Areas requiring removal of foundry sand will be excavated and regraded to minimize potential for future erosion or movement. Should liner or geocomposite damage be noted by the contractor, the damage should be reported to Viking immediately. Liner damage will be repaired by calling qualified liner installers to repair the geosynthetic liner.

3.4 Fill Rate

To develop revised final contours and forecast the associated Landfill closure date, GHD calculated a fill rate for the Site based on data from the survey conducted October 2021. Based on the current grades, GHD calculated a total volume of approximately 49,300 cubic yards of foundry sand placed between the partial closure/lined expansion construction and the survey date (7 years). This corresponds to an annual fill rate of approximately 7,000 cubic yards.

This Design and Operational Plan will be updated on an as-needed basis and provided to Viking's filling contractor. Generally, the filling of the fully lined footprint will start in the middle section of the Landfill and the move southwestward until the lower and upper cells are combined and the access road allows haulers to safely access to the entire active waste surface area. The waste will be deposited on the active open face of the cell, levelled, and compacted.

Each filling phase will be accessed by the 15-foot wide road constructed of at minimum 3 ft of foundry sand such that the foundry equipment can dump from each side of the road. A cross section of the road is shown on drawing C-105 in Appendix A.

3.5 5-Year Fill Plan

Based on the estimated deposition rate, the active Landfill is expected to reach a volume of approximately 91,000 cubic yards in 2027. The access road will not need to be rebuilt since the elevation of waste will be approximately 567 ft and the general slope of the Landfill remains at positive 5 percent.

The 5-year Landfill contours are shown on drawing C-102 in Appendix A. The contours were designed to match the active waste deposition limits necessary to build up the Landfill fill to a permitted maximum elevation of 986 ft at the time of closure.

3.6 10-Year Fill Plan

The road elevation will need to be increased on an annual basis after 5 years of operation of the implemented Fill and Operations Plan to ensure the haulers can deposit waste safely. The road elevation will be increased in 1-foot lifts of compacted foundry sand annually, maintaining the general positive 5 percent grade and a 3-ft difference between the active waste and road elevations.

The estimated 10-year Landfill volume based on the estimated deposition rate is approximately 126,200 cubic yards, bringing the expected elevation to 985 ft. The access road may need to be re-designed/-built in approximately 10 years, to accommodate the estimated waste elevation of the 10-year Fill Plan contours, which are shown on drawing C-103 in Appendix A. The contours were designed to match the active waste deposition limits necessary to build up the Landfill fill to a permitted maximum elevation of 986 ft at the time of closure.

Alternatively, the roadway locations may be adjusted, or more than 1-foot of rise may be incorporated in one season to maximize work efficiency.

3.7 Leachate Control Plan

This section meets the requirements of the IAC 567 115.26(12) leachate control plan submission.

During landfill cell and partial cover construction in 2014, it was determined that the waste mass contained leachate and released it slowly through the natural clay. The unlined landfill was closed in 2014, and the active areas for future waste disposal are lined. IDNR approved the removal of the former leachate piezometers when the landfill was capped. Leachate within the closed landfill was dewatered through a drain tile that was installed during construction. The drain tile discharge line was sealed late July 2019 as flows had decreased substantially. The discharge pipe was filled with bentonite, plugged, capped, and sealed. The LCS was installed during bottom liner construction in 2014. Records drawings for the LCS are included in Appendix A in Doc 81938.

The existing lined footprint head is monitored in the sump as standard practice. There are no new fill areas that did not previously receive waste. Leachate head is recorded monthly and reported annually with the leachate volumes supplied in the Annual Water Quality Reports. The nature of the foundry sand creates a transmissive waste mass. Although capillary action is possible, most water will percolate through to the leachate collection media and toward the sump. Viking was issued a Discharge Permit allowing leachate discharge to City of Cedar Falls Water Reclamation Facility under a pretreatment agreement. Leachate is not stored at the Landfill.

Leachate samples are collected from the landfill leachate sump on a semiannual basis during the routine water monitoring events. Analytical results are included in the annual water quality monitoring report.

3.8 Landfill Maintenance

The Landfill is inspected on a semi-annual basis by a professional engineer registered in Iowa. Reports are submitted to the IDNR within 30 days of the inspection. Open burning, littering, and scavenging is prohibited at the Landfill. Since landfill gases are not generated by the accepted waste, Viking does not need to control flies, other inspects, rodents and other vermin at the Landfill. Daily soil cover is not placed on the Landfill due to the nature of the waste material (inorganic and non-flammable).

4. Site Information

Certain documents/records shall be kept onsite for safekeeping.

4.1 Records

A copy of the current permit, engineering plans, operator certifications and reports are kept in the on-site office of the environmental manager

4.2 Signage

Access to the landfill is managed by Viking's property security. The Landfill is not open to the public and currently has a permanent sign posted near the access road to the Landfill specifying:

> NO PUBLIC DUMPING
> Viking Pump Foundry Sand Landfill
> Site Permit Number: 7-SDP-12-89P-FSL
> Site Contact: Randy Hansen (319) 222-2422 and Evan Arachikavitz (319) 883-6920

The sign may be updated to reflect changes in personnel.

Appendices

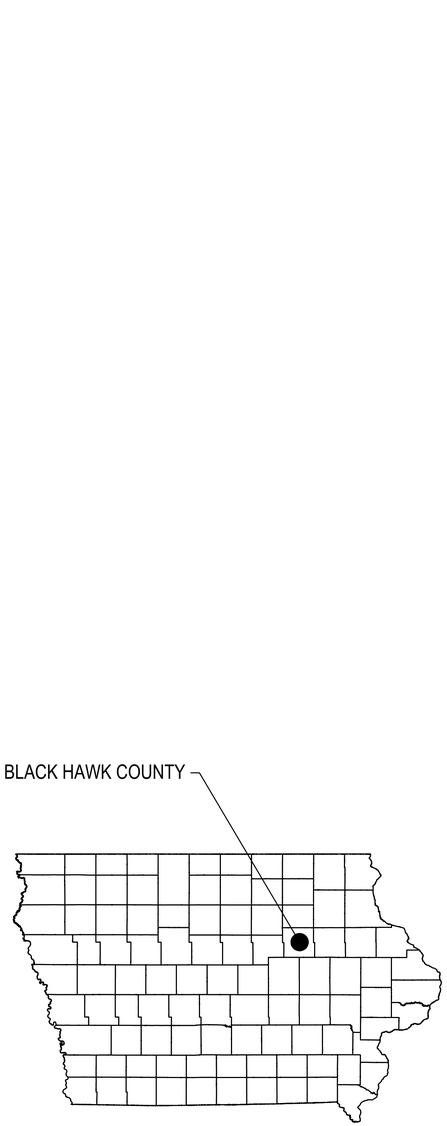
Appendix A

Landfill Drawings

VIKING PUMP
FOUNDRY SAND LANDFILL
CEDAR FALLS, IOWA
DESIGN AND OPERATIONAL PLAN

JUNE 2024

056934



AREA MAP

LOCATION MAP

DRAWING LIST	
Sheet Number	Sheet Title
C-001	COVER SHEET
C-051	EXISTING CONDITIONS
C-101	5 YEAR FILL PLAN
C-102	10 YEAR FILL PLAN
C-103	FINAL TOP OF WASTE
C-104	FINAL TOP OF WASTE CROSS-SECTIONS
C-105	DETAILS

PRELIMINARY

No.	Issue	Drafting Check	Checked	Approved	Date
1	ISSUED FOR PERMIT		EM	MZ	05-22-24

Author **S. PIKE** | Drafting Check **S. PIKE** | Project Manager **M. ZUCKWIELER**

Designer **S. WHITE** | Design Check **E. MITCHELL** | Project Director **M. ZUCKWIELER**

Bar is one inch on original size sheet

0 1"

GHD Consulting Services Inc.
285 Delaware Avenue, Suite 500
Buffalo NY 14202 USA
T 1 716 856 2142 **F** 1 716 856 2160 **W** www.ghd.com
www.ghd.com

Client **VIKING PUMP FOUNDRY SAND LANDFILL CEDAR FALLS, IOWA**

Project **DESIGN AND OPERATIONAL PLAN**

Title **COVER SHEET**

Size **ARCH D**

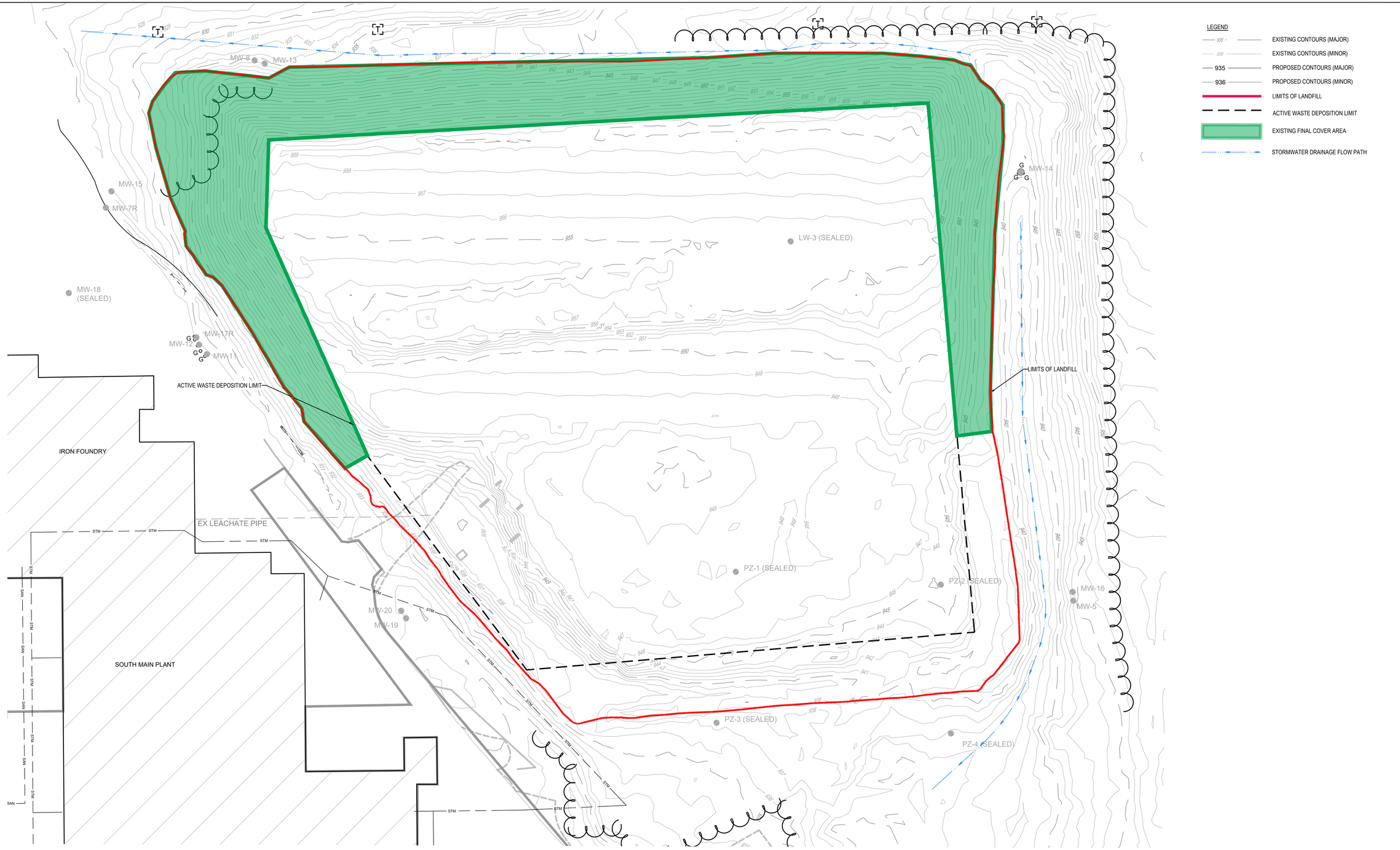
Project No. **056934**

Date **MAY 2024**

Scale

Sheet No. **C-001**

Plot Date: 22 May 2024 - 2:06 PM
Plotted By: Sean Pike
Filename: C:\Users\srpike\DC\ACCDocs\GHD Services Pty Ltd\056934-Viking Pump-Foundry Sand Landfill\Project Files\01 WIP\01 - Civil\Sheets\056934-C-001.dwg



SITE PLAN

SCALE: 1" = 40'

0 20' 40' 80'

N

REFERENCE NOTE:

1. AERIAL FLYOVER SURVEY PERFORMED BY GHD ON 10/27/21, COORDINATE SYSTEM: NORTH AMERICAN DATUM83 IOWA NORTH.

PRELIMINARY

No.	Issue	Checked	Approved	Date
1	ISSUED FOR PERMIT	EM	MZ	05-22-24

Author S. PIKE	Drafting Check S. PIKE	Project Manager M. ZUCKWIELER	
Designer S. WHITE	Design Check E. MITCHELL	Project Director M. ZUCKWIELER	

Bar is one inch on original size sheet

0 1"

GHD Consulting Services Inc.
285 Delaware Avenue, Suite 500
Buffalo NY 14202 USA
T 1 716 856 2142 F 1 716 856 2160 W www.ghd.com
www.ghd.com

Client VIKING PUMP FOUNDRY SAND LANDFILL
CEDAR FALLS, IOWA

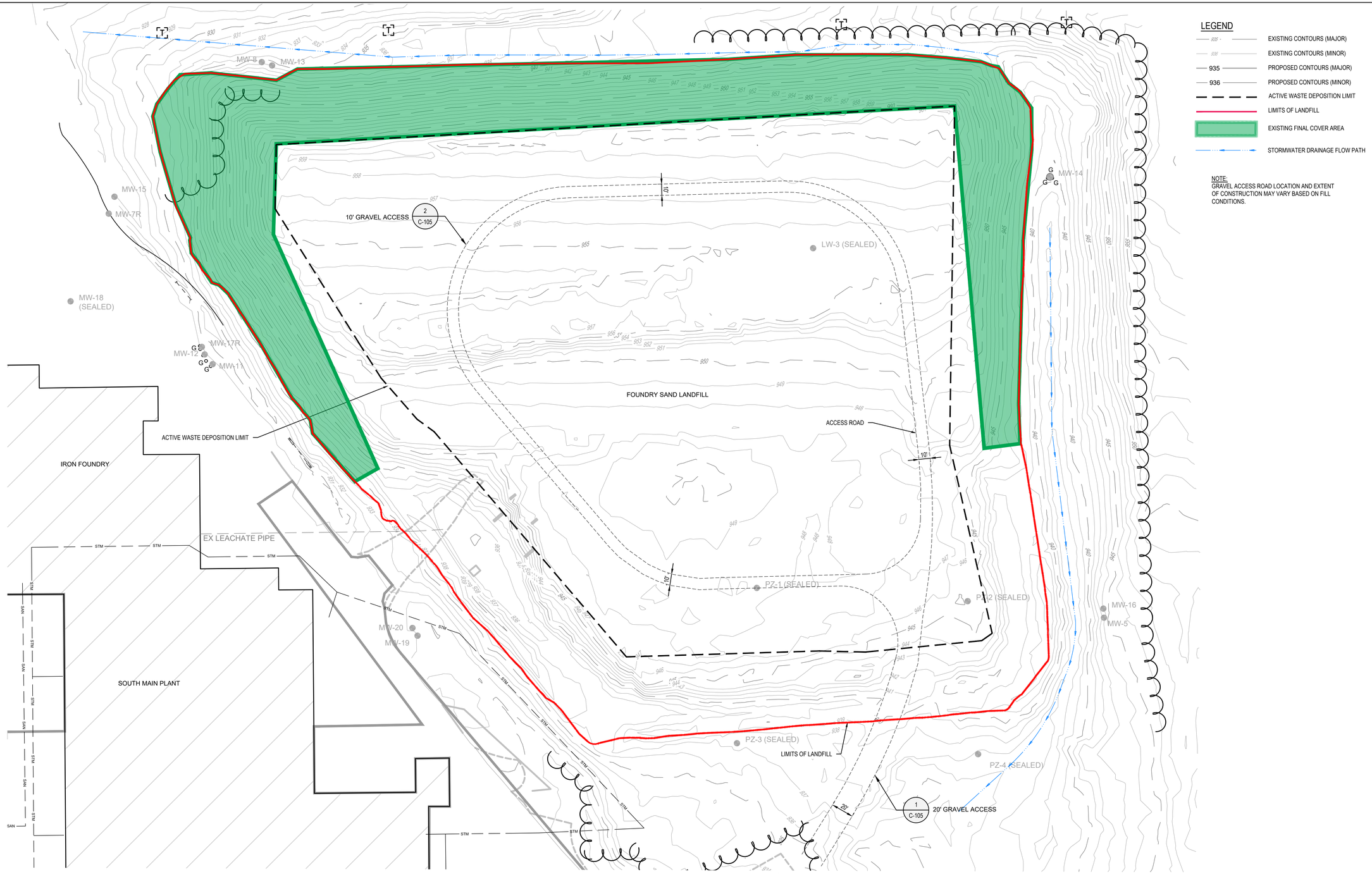
Project DESIGN AND OPERATIONAL PLAN

Title EXISTING CONDITIONS

Size ARCH D

Project No.	Date	Scale	Sheet No.
056934	MAY 2024		C-051

Plot Date: 22 May 2024 - 2:06 PM Plotted By: Sean Pike Filename: C:\Users\arpike\DC\ACCDocs\GHD Services Pty Ltd\056934-Viking Pump-Foundry Sand Landfill\Project Files\01 WIP\01 - Civil\Sheets\056934-C-051.dwg



REFERENCE NOTE:
1. AERIAL FLYOVER SURVEY PERFORMED BY GHD ON 10/27/21, COORDINATE SYSTEM: NORTH AMERICAN DATUM83 IOWA NORTH.

PRELIMINARY

No.	Issue	Checked	Approved	Date
1	ISSUED FOR PERMIT	EM	MZ	05-22-24

Author S. PIKE | Drafting Check S. PIKE | Project Manager M. ZUCKWIELER
Designer S. WHITE | Design Check E. MITCHELL | Project Director M. ZUCKWIELER

Bar is one inch on original size sheet
0 1"

GHD Consulting Services Inc.
285 Delaware Avenue, Suite 500
Buffalo NY 14202 USA
T 1 716 856 2142 F 1 716 856 2160 W www.ghd.com
www.ghd.com

Client: VIKING PUMP FOUNDRY SAND LANDFILL
CEDAR FALLS, IOWA
Project: DESIGN AND OPERATIONAL PLAN

Title: 5 YEAR FILL PLAN

Size: ARCH D

Project No.	Date	Scale	Sheet No.
056934	MAY 2024	AS SHOWN	C-101

Plot Date: 17 June 2024 - 4:40 PM Plotted By: Sean Pike Filename: C:\Users\srpike\DC\ACCDocs\GHD Services Pty Ltd\056934-Viking Pump-Foundry Sand Landfill\Project Files\01 WIP\01 - Civil\Sheets\056934-C-101.dwg

REFERENCE NOTE:
1. AERIAL FLYOVER SURVEY PERFORMED BY GHD ON 10/27/21, COORDINATE SYSTEM: NORTH AMERICAN DATUM83 IOWA NORTH.

PRELIMINARY

No.	Issue	Checked	Approved	Date
1	ISSUED FOR PERMIT	EM	MZ	05-22-24

Author S. PIKE	Drafting Check S. PIKE	Project Manager M. ZUCKWIELER	
Designer S. WHITE	Design Check E. MITCHELL	Project Director M. ZUCKWIELER	

Bar is one inch on original size sheet
0 1"

GHD Consulting Services Inc.
285 Delaware Avenue, Suite 500
Buffalo NY 14202 USA
T 1 716 856 2142 F 1 716 856 2160 W www.ghd.com
www.ghd.com

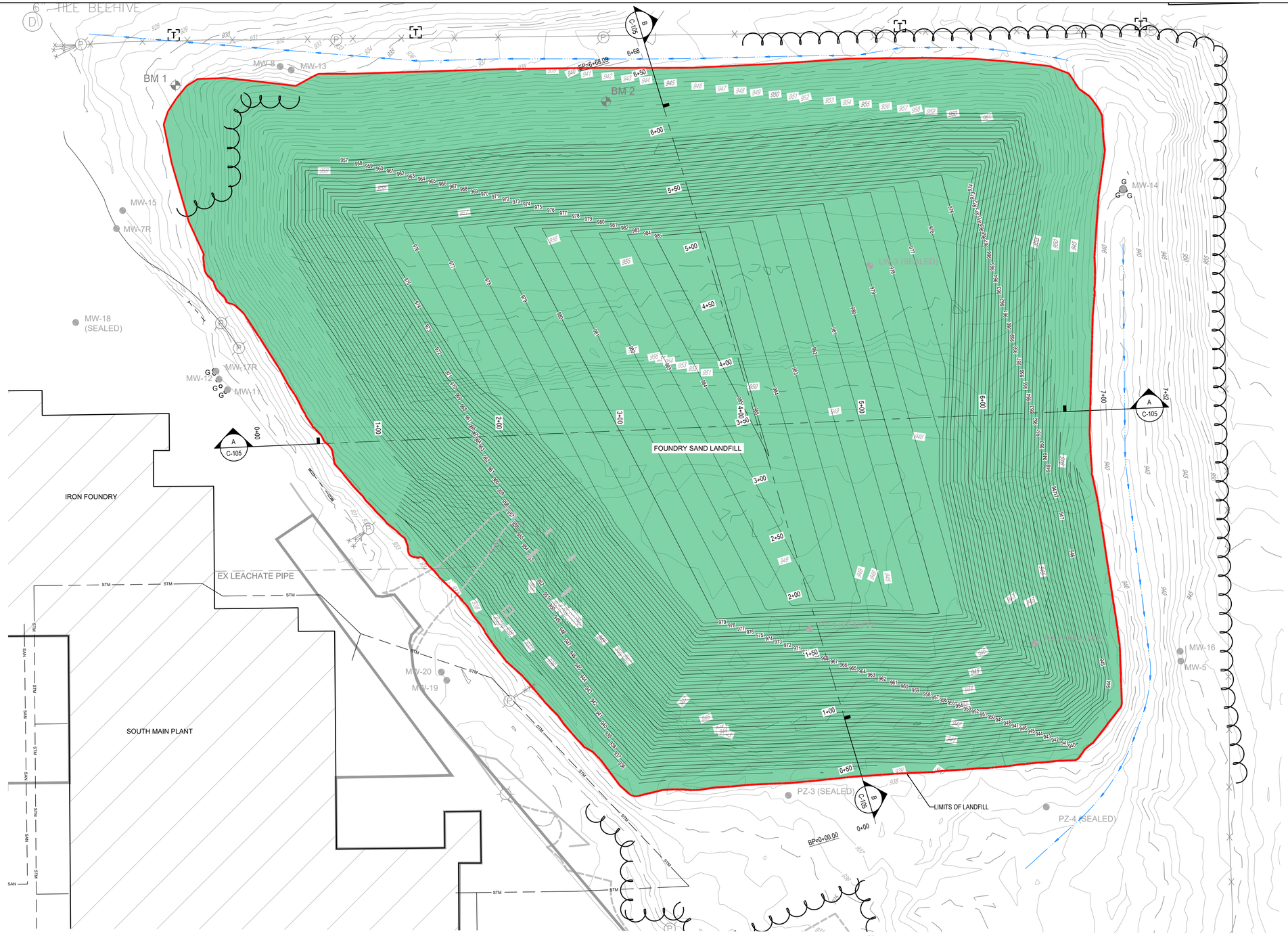
Client VIKING PUMP FOUNDRY SAND LANDFILL
CEDAR FALLS, IOWA
Project DESIGN AND OPERATIONAL PLAN

Title 10 YEAR FILL PLAN

Size ARCH D

Project No.	Date	Scale	Sheet No.
056934	MAY 2024		C-102

Plot Date: 17 June 2024 - 4:40 PM Plotted By: Sean Pike Filename: C:\Users\srpike\DC\ACCDocs\GHD Services Pty Ltd\056934-Viking Pump-Foundry Sand Landfill\Project Files\01 WIP\01 - Civil\Sheets\056934-C-102.dwg



SITE PLAN

SCALE: 1" = 40'

0 20' 40' 80'

N

REFERENCE NOTE:

1. AERIAL FLYOVER SURVEY PERFORMED BY GHD ON 10/27/21, COORDINATE SYSTEM: NORTH AMERICAN DATUM83 IOWA NORTH.

PRELIMINARY

No.	Issue	Checked	Approved	Date
1	ISSUED FOR PERMIT	EM	MZ	05-22-24

Author S. PIKE | Drafting Check S. PIKE | Project Manager M. ZUCKWIELER

Designer S. WHITE | Design Check E. MITCHELL | Project Director M. ZUCKWIELER

Bar is one inch on original size sheet

0 1"

GHD Consulting Services Inc.
285 Delaware Avenue, Suite 500
Buffalo NY 14202 USA
T 1 716 856 2142 F 1 716 856 2160 W www.ghd.com
www.ghd.com

Client VIKING PUMP FOUNDRY SAND LANDFILL
CEDAR FALLS, IOWA

Project DESIGN AND OPERATIONAL PLAN

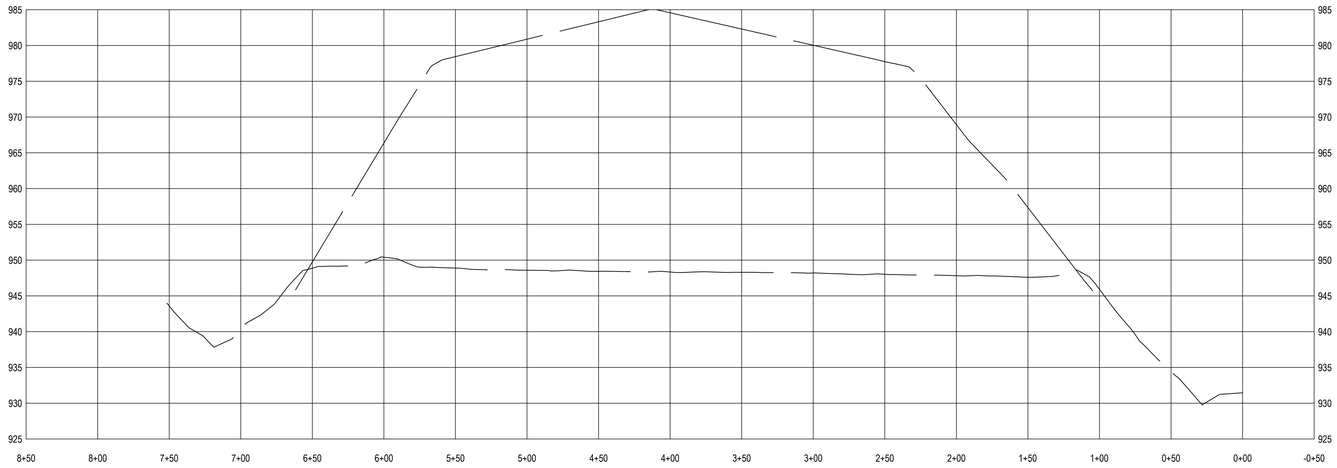
Title FINAL TOP OF WASTE

Size ARCH D

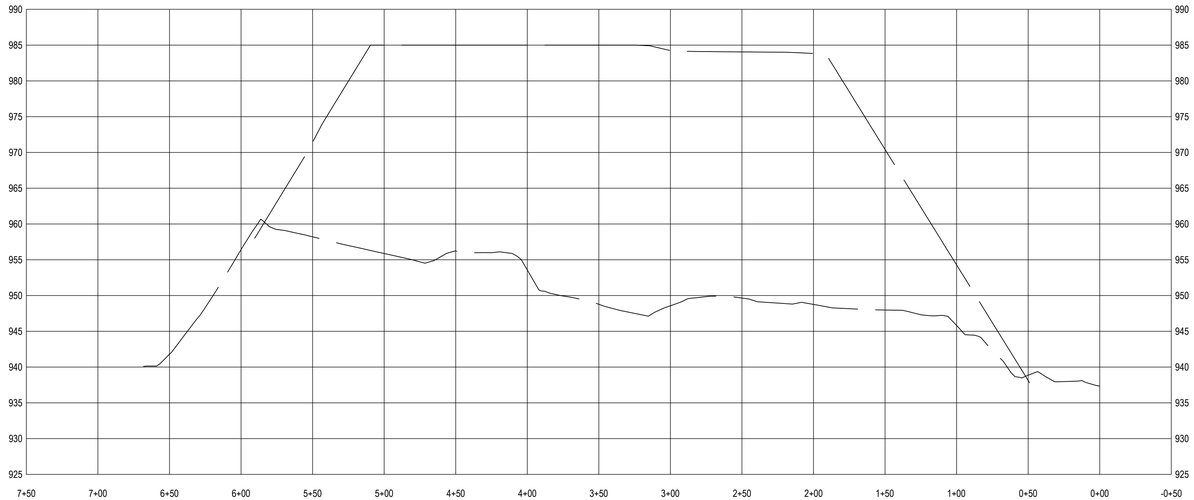
Project No. 056934 | Date MAY 2024 | Scale

Sheet No. C-103

Plot Date: 22 May 2024 - 2:07 PM | Plotted By: Sean Pike | Filename: C:\Users\arpike\DC\ACCDocs\GHD Services Pty Ltd\056934-Viking Pump-Foundry Sand Landfill\Project Files\01 WIP\01 - Civil\Sheets\056934-C-103.dwg



FINAL TOP OF WASTE A-A



FINAL TOP OF WASTE B-B

PRELIMINARY

No.	Issue		Checked	Approved	Date
1	**ISSUED FOR PERMIT**		**EM**	**MZ**	**05-22-24**
Author	**S. PIKE**	Drafting Check	**S. PIKE**	Project Manager	**M. ZUCKWIELER**
Designer	**S. WHITE**	Design Check	**E. MITCHELL**	Project Director	**M. ZUCKWIELER**

Bar is one inch on original size sheet
0 1"

GHD Consulting Services Inc.
285 Delaware Avenue, Suite 500
Buffalo NY 14202 USA
T 1 716 856 2142 **F** 1 716 856 2160 **W** www.ghd.com
www.ghd.com

Client **VIKING PUMP FOUNDRY SAND LANDFILL**
CEDAR FALLS, IOWA
Project **DESIGN AND OPERATIONAL PLAN**

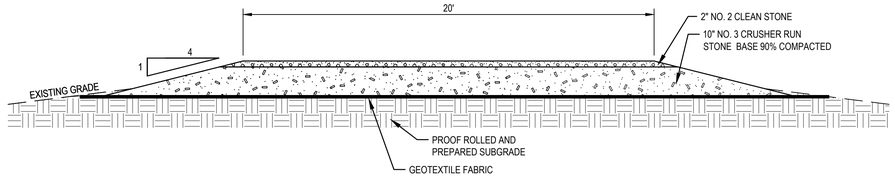
Title **FINAL TOP OF WASTE CROSS-SECTIONS**

Size **ARCH D**

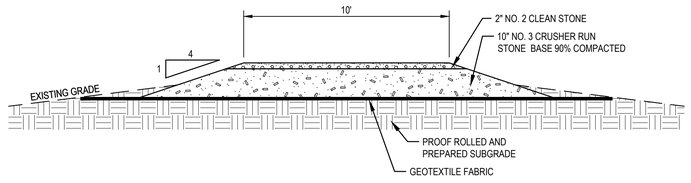
Project No. **056934**
Date **MAY 2024**
Scale

Sheet No. **C-104**

Plot Date: 22 May 2024 - 2:07 PM
Plotted By: Sean Pike
Filename: C:\Users\srpike\DC\ACCDocs\GHD Services Pty Ltd\056934-Viking Pump-Foundry Sand Landfill\Project Files\01 WIP\01 - Civil\Sheets\056934-C-105.dwg



1 C102 **GRAVEL ACCESS ROAD**
NTS



2 C102 **GRAVEL ACCESS ROAD**
NTS

NOTE: Gravel Access Road Construction may be modified as conditions warrant

PRELIMINARY

No.	Issue	Checked	Approved	Date
1	ISSUED FOR PERMIT	EM	MZ	05-22-24

Author S. PIKE	Drafting Check S. PIKE	Project Manager M. ZUCKWIELER	
Designer S. WHITE	Design Check E. MITCHELL	Project Director M. ZUCKWIELER	

Bar is one inch on original size sheet
0 1"

GHD Consulting Services Inc.
285 Delaware Avenue, Suite 500
Buffalo NY 14202 USA
T 1 716 856 2142 F 1 716 856 2160 W www.ghd.com
www.ghd.com

Client VIKING PUMP FOUNDRY SAND LANDFILL
CEDAR FALLS, IOWA
Project DESIGN AND OPERATIONAL PLAN

Title DETAILS

Size ARCH D

Project No. 056934
Date MAY 2024
Scale

Sheet No. C-105

Plot Date: 22 May 2024 - 2:07 PM
Plotted By: Sean Pike
Filename: C:\Users\srpike\DC\ACCDocs\GHD Services Pty Ltd\056934-Viking Pump-Foundry Sand Landfill\Project Files\01 WIP\01 - Civil\Sheets\056934-C-104.dwg

Appendix B

TCLP Analysis of Baghouse Dust

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Evan Arachikavitz
Viking Pump Inc
711 Viking Road
Cedar Falls, Iowa 50613-0008

Generated 6/13/2024 9:59:07 AM

JOB DESCRIPTION

BH Dust TRI Determination

JOB NUMBER

310-282775-2

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

Eurofins Cedar Falls

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

Generated
6/13/2024 9:59:07 AM

Authorized for release by
Conner Calhoun, Project Management Assistant I
Conner.Calhoun@et.eurofinsus.com
(319)277-2401

Job Narrative
310-282775-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 6/5/2024 2:55 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 25.8°C.

Metals
Method 6010D - TCLP: The following sample(s) was diluted due to the presence of an interferent. >: BH 3 & 5 Dust (310-282775-2) and Amtech BH Dust (310-282775-3). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: Viking Pump Inc
Project/Site: BH Dust TRI Determination

Job ID: 310-282775-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-282775-1	BH 1, 2, & 4 Dust	Solid	06/05/24 00:00	06/05/24 14:55
310-282775-2	BH 3 & 5 Dust	Solid	06/05/24 00:00	06/05/24 14:55
310-282775-3	Amtech BH Dust	Solid	06/05/24 00:00	06/05/24 14:55

Client Sample Results

Client: Viking Pump Inc
Project/Site: BH Dust TRI Determination

Job ID: 310-282775-2

Client Sample ID: BH 1, 2, & 4 Dust

Lab Sample ID: 310-282775-1
Matrix: Solid
Date Collected: 06/05/24 00:00
Date Received: 06/05/24 14:55

Method: 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Arsenic	<0.100		0.100		mg/L		06/12/24 14:01	1	ZRI4
Barium	**0.223**		0.200		mg/L		06/12/24 14:01	1	ZRI4
Cadmium	**0.0413**		0.0200		mg/L		06/12/24 14:01	1	ZRI4
Chromium	<0.0200		0.0200		mg/L		06/12/24 14:01	1	ZRI4
Lead	**0.479**		0.100		mg/L		06/12/24 14:01	1	ZRI4
Selenium	**0.112**		0.100		mg/L		06/12/24 14:01	1	ZRI4
Silver	<0.0500		0.0500		mg/L		06/12/24 14:01	1	ZRI4

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Mercury	<0.00200		0.00200		mg/L		06/12/24 13:39	1	A6US

Client Sample ID: BH 3 & 5 Dust

Lab Sample ID: 310-282775-2
Matrix: Solid
Date Collected: 06/05/24 00:00
Date Received: 06/05/24 14:55

Method: 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Arsenic	<0.200		0.200		mg/L		06/12/24 14:10	2	ZRI4
Barium	<0.400		0.400		mg/L		06/12/24 14:10	2	ZRI4
Cadmium	<0.0400		0.0400		mg/L		06/12/24 14:10	2	ZRI4
Chromium	<0.0400		0.0400		mg/L		06/12/24 14:10	2	ZRI4
Lead	<0.200		0.200		mg/L		06/12/24 14:10	2	ZRI4
Selenium	<0.200		0.200		mg/L		06/12/24 14:10	2	ZRI4
Silver	<0.100		0.100		mg/L		06/12/24 14:10	2	ZRI4

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Mercury	<0.00200		0.00200		mg/L		06/12/24 13:41	1	A6US

Client Sample ID: Amtech BH Dust

Lab Sample ID: 310-282775-3
Matrix: Solid
Date Collected: 06/05/24 00:00
Date Received: 06/05/24 14:55

Disregard: sample "Amtech BH Dust" is not destined for the landfill

Method: 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Arsenic	<0.200		0.200		mg/L		06/12/24 14:12	2	ZRI4
Barium	<0.400		0.400		mg/L		06/12/24 14:12	2	ZRI4
Cadmium	**0.186**		0.0400		mg/L		06/12/24 14:12	2	ZRI4
Chromium	<0.0400		0.0400		mg/L		06/12/24 14:12	2	ZRI4
Lead	<0.200		0.200		mg/L		06/12/24 14:12	2	ZRI4
Selenium	**39.0**		0.200		mg/L		06/12/24 14:12	2	ZRI4
Silver	<0.100		0.100		mg/L		06/12/24 14:12	2	ZRI4

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Mercury	<0.00200		0.00200		mg/L		06/12/24 13:43	1	A6US

Accreditation/Certification and Definitions Summary

Client: Viking Pump Inc
Job ID: 310-282775-2
Project/Site: BH Dust TRI Determination

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-25

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
MRL	Method Reporting Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
SDL	Sample Detection Limit
SDL	Sample Detection Limit
SDL	Sample Detection Limit
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: Viking Pump Inc
Project/Site: BH Dust TRI Determination

Job ID: 310-282775-2

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
1311	TCLP Extraction	SW846	EET CF
3010A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

eurofins | Environment Testing America

310-282775 Chain of Custody

Cooler/Sample Receipt and Temper

Client Information

Client: V.K.A.S Rep

City/State: CITY Cedar Falls | STATE IA | Project: BH Aus

Receipt Information

Date/Time Received: DATE 6/5/24 | TIME 1455 | Received By: TC

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☐ Lab Courier ☐ Lab Field Services ☑ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☐ Yes ☑ No *If yes:* Cooler ID:

Multiple Coolers? ☐ Yes ☑ No *If yes:* Cooler # _____ of _____

Cooler Custody Seals Present? ☐ Yes ☑ No *If yes:* Cooler custody seals intact? ☐ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☑ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☑ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☐ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: U | Correction Factor (°C): 0.0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): | Corrected Temp (°C):

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:	32 oz Jar	
Uncorrected Temp (°C):	25.8	
Corrected Temp (°C):	25.8	

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☑ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☑ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

ENVIRONMENTAL CHAIN OF CUSTODY

Viking Pump
711 Viking Road
Cedar Falls, IA 50613

DATE SHIPPED	# OF SAMPLES	PROJECT NAME OR NUMBER
June 5, 2024	3	BH Dust TRI Determination

PURCHASE ORDER NO	CONTACT	TELEPHONE NUMBER
	Evan Arachikavitz	(319) 883-6920

RUSH ANALYSIS
☐ Same Day
☐ One Day
☐ Two Day
☐ Three Day
Extra Charge

E-MAIL ADDRES.
earachikavitz@idexcorp.com

SPECIAL INSTRUCTIONS
Looking for ASAP rush on all totals TCLP can wait. 2 different reports are expected

CHAIN OF CUSTODY RECORD

MATRIX CODES
A = AQUEOUS O = OIL
S = SOLID X = OTHER
DW = DRINKING WATER W = WIPES

ANALYSIS REQUESTED (Place an "X" in the box below to indicate request)

Lab ID	Sample Identification	Date & Time	MATRIX	# Of Bottles	Grab / Comp	RCRA 8 Metals TCLP	RCRA 8 Metals Totals	Total Manganese	Total Aluminum	Total Zinc	Total Copper	Total Cobalt	Total Nickel	Total Cobalt	Total Beryllium	Preservative H_2SO_4	Preservative HCL	Preservative HNO_3	Preservative NaOH	Preservative Other	COMMENTS
	BH 1, 2, & 4 Dust	June 5, 2024	S	1	G	x	x	x	x	x	x	x	x	x	x						
	BH 3 & 5 Dust	June 5, 2024	S	1	G	x	x	x	x	x	x	x	x	x	x						
	Amtech BH Dust	June 5, 2024	S	1	G	x	x	x	x	x	x	x	x	x	x						
	BH 6 Dust	June 5, 2024	S	1	G		x	x	x	x	x	x	x	x							

Temperature on Arrival
Received on Ice ☐ Yes ☐ No

SAMPLED BY (PRINT NAME)	SAMPLED BY (SIGNATURE TO INITIATE COC)	DATE	TIME
Evan Arachikavitz		June 5, 2024	

SAMPLES RECEIVED BY (SIGNATURE)	DATE	TIME	CONDITION	SAMPLES RELINQUISHED BY (SIGNATURE)	DATE	TIME	CONDITION
					6/5/24	1455	

ENVCOC-01 (REV.4/2012)

6/13/2024

Appendix C

TCLP Analysis of Foundry Sand

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Mr. Grant Anderson
GHD Services Inc.
900 Long Lake Road
Suite 200
New Brighton, Minnesota 55112

Generated 4/12/2024 12:39:13 PM

JOB DESCRIPTION

Viking Pump Landfill

JOB NUMBER

310-278364-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

Generated
4/12/2024 12:39:13 PM

Authorized for release by
Zach Bindert, Client Service Manager
Zach.Bindert@et.eurofinsus.com
(319)277-2401

Table of Contents

Job Narrative
310-278364-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The sample was received on 4/5/2024 11:40 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.6°C.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: GHD Services Inc.
Job ID: 310-278364-1
Project/Site: Viking Pump Landfill

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-278364-1	S-240405-EM-WFS	Solid	04/05/24 10:43	04/05/24 11:40

Detection Summary

Client: GHD Services Inc.
Job ID: 310-278364-1
Project/Site: Viking Pump Landfill

Client Sample ID: S-240405-EM-WFS **Lab Sample ID: 310-278364-1**

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client Sample Results

Client: GHD Services Inc.
Project/Site: Viking Pump Landfill

Job ID: 310-278364-1

Client Sample ID: S-240405-EM-WFS

Lab Sample ID: 310-278364-1

Date Collected: 04/05/24 10:43

Matrix: Solid

Date Received: 04/05/24 11:40

Method: SW846 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.100		0.100		mg/L		04/10/24 09:00	04/10/24 17:53	1
Barium	<0.200		0.200		mg/L		04/10/24 09:00	04/10/24 17:53	1
Cadmium	<0.0200		0.0200		mg/L		04/10/24 09:00	04/10/24 17:53	1
Chromium	<0.0200		0.0200		mg/L		04/10/24 09:00	04/10/24 17:53	1
Lead	<0.100		0.100		mg/L		04/10/24 09:00	04/10/24 17:53	1
Selenium	<0.100		0.100		mg/L		04/10/24 09:00	04/10/24 17:53	1
Silver	<0.0500		0.0500		mg/L		04/10/24 09:00	04/10/24 17:53	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00200		0.00200		mg/L		04/10/24 10:40	04/11/24 12:57	1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client: GHD Services Inc.
Project/Site: Viking Pump Landfill

Job ID: 310-278364-1

Method: 6010D - Metals (ICP)

Lab Sample ID: LB 310-418143/1-B
Matrix: Solid
Analysis Batch: 418462

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 418254

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.100		0.100		mg/L		04/10/24 09:00	04/10/24 17:16	1
Barium	<0.200		0.200		mg/L		04/10/24 09:00	04/10/24 17:16	1
Cadmium	<0.0200		0.0200		mg/L		04/10/24 09:00	04/10/24 17:16	1
Chromium	<0.0200		0.0200		mg/L		04/10/24 09:00	04/10/24 17:16	1
Lead	<0.100		0.100		mg/L		04/10/24 09:00	04/10/24 17:16	1
Selenium	<0.100		0.100		mg/L		04/10/24 09:00	04/10/24 17:16	1
Silver	<0.0500		0.0500		mg/L		04/10/24 09:00	04/10/24 17:16	1

Lab Sample ID: LCS 310-418143/2-B
Matrix: Solid
Analysis Batch: 418462

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 418254

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	4.00	3.899		mg/L		97	80 - 120
Barium	2.00	2.025		mg/L		101	80 - 120
Cadmium	2.00	1.827		mg/L		91	80 - 120
Chromium	2.00	1.883		mg/L		94	80 - 120
Lead	4.00	3.691		mg/L		92	80 - 120
Selenium	8.00	7.819		mg/L		98	80 - 120
Silver	2.00	2.060		mg/L		103	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LB 310-418143/1-C
Matrix: Solid
Analysis Batch: 418535

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 418342

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00200		0.00200		mg/L		04/10/24 10:40	04/11/24 12:29	1

Lab Sample ID: LCS 310-418143/2-C
Matrix: Solid
Analysis Batch: 418535

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 418342

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.0167	0.01748		mg/L		105	80 - 120

QC Association Summary

Client: GHD Services Inc.
Project/Site: Viking Pump Landfill

Job ID: 310-278364-1

Metals

Leach Batch: 418143

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278364-1	S-240405-EM-WFS	TCLP	Solid	1311	
LB 310-418143/1-B	Method Blank	TCLP	Solid	1311	
LB 310-418143/1-C	Method Blank	TCLP	Solid	1311	
LCS 310-418143/2-B	Lab Control Sample	TCLP	Solid	1311	
LCS 310-418143/2-C	Lab Control Sample	TCLP	Solid	1311	

Prep Batch: 418254

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278364-1	S-240405-EM-WFS	TCLP	Solid	3010A	418143
LB 310-418143/1-B	Method Blank	TCLP	Solid	3010A	418143
LCS 310-418143/2-B	Lab Control Sample	TCLP	Solid	3010A	418143

Prep Batch: 418342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278364-1	S-240405-EM-WFS	TCLP	Solid	7470A	418143
LB 310-418143/1-C	Method Blank	TCLP	Solid	7470A	418143
LCS 310-418143/2-C	Lab Control Sample	TCLP	Solid	7470A	418143

Analysis Batch: 418462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278364-1	S-240405-EM-WFS	TCLP	Solid	6010D	418254
LB 310-418143/1-B	Method Blank	TCLP	Solid	6010D	418254
LCS 310-418143/2-B	Lab Control Sample	TCLP	Solid	6010D	418254

Analysis Batch: 418535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278364-1	S-240405-EM-WFS	TCLP	Solid	7470A	418342
LB 310-418143/1-C	Method Blank	TCLP	Solid	7470A	418342
LCS 310-418143/2-C	Lab Control Sample	TCLP	Solid	7470A	418342

Lab Chronicle

Client: GHD Services Inc.
Job ID: 310-278364-1
Project/Site: Viking Pump Landfill

Client Sample ID: S-240405-EM-WFS
Lab Sample ID: 310-278364-1

Date Collected: 04/05/24 10:43
Matrix: Solid
Date Received: 04/05/24 11:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			418143	D0DG	EET CF	04/08/24 15:30 - 04/09/24 08:00 [1]
TCLP	Prep	3010A			418254	KM3E	EET CF	04/10/24 09:00
TCLP	Analysis	6010D		1	418462	ZRI4	EET CF	04/10/24 17:53
TCLP	Leach	1311			418143	D0DG	EET CF	04/08/24 15:30 - 04/09/24 08:00 [1]
TCLP	Prep	7470A			418342	A6US	EET CF	04/10/24 10:40
TCLP	Analysis	7470A		1	418535	A6US	EET CF	04/11/24 12:57

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: GHD Services Inc.
Job ID: 310-278364-1
Project/Site: Viking Pump Landfill

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-25

Method Summary

Client: GHD Services Inc.
Job ID: 310-278364-1
Project/Site: Viking Pump Landfill

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
1311	TCLP Extraction	SW846	EET CF
3010A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

eurofins | Environment Testing America

310-278364 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: GHD

City/State: CITY | STATE MN | Project:

Receipt Information

Date/Time Received: DATE 4-5-24 | TIME 1140 | Received By: MC

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☐ Lab Courier ☐ Lab Field Services ☒ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☐ Yes ☒ No *If yes:* Cooler # _____ of _____

Cooler Custody Seals Present? ☒ Yes ☐ No *If yes:* Cooler custody seals intact? ☒ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☒ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☒ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: T | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 3.6 | Corrected Temp (°C): 3.6

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

dress Eurofins
3019 Venture Way
Cedar Falls, IA 50613

Chain of Custody Record 649066

eurofins | Environment Testing America

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TAL-8210

Client Contact	Project Manager: Grant Anderson	Site Contact: Elizabeth Mitchell	Date:	COC No: 2
mpany Name GHD	Tel/Email: @ghd.com	Lab Contact: Zach Binder	Carrier:	1 of 1 COCs
dress 900 Long Lake Rd Ste 250	Analysis Turnaround Time			Sampler
y/State/Zip MN, 55112	☐ CALENDAR DAYS ☒ WORKING DAYS			For Lab Use Only:
one 651-639-8913	TAT if different from Below			Walk-in Client:
x	☒ 2 weeks			Lab Sampling
oject Name Viking Fury	☐ 1 week			
e Landfill	☐ 2 days			Job / SDG No
O # 056934	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	TCLP - RCRA Metals	Sample Specific Notes
-240405-EM-WFS	4/5/24	1043	C	Soil	1	N	N	X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No | Cooler Temp (°C) Obs'd _____ Corr'd _____ | Therm ID No _____

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
	GHD	4/5/24 1119			4/5/24 1140
Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Relinquished by	Company	Date/Time	Received in Laboratory by	Company	Date/Time

Page 15 of 16

4/12/2024

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 310-278364-1

Login Number: 278364

List Source: Eurofins Cedar Falls

List Number: 1

Creator: Costello, Mackenzie K

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Emergency Response and Remedial Action Plan

Permit No. 07-SDP-12-98 Renewal Application

IDEX Corporation

February 14, 2025

→ The Power of Commitment

Contents

Contents (cont'd)

Table index

Appendices

1. Introduction

1.1 Site Background

Viking Pump, Inc. (Viking) operates a Foundry and Landfill located in the SW 1/4, of the SW 1/4 of Section 22, Township 89 North, Range 14 West in Black Hawk County, Iowa. The Landfill is located in an area that is zoned as M-2 - Heavy Industrial uses according to the Cedar Falls current zoning plan. The properties directly adjacent to the Landfill are also zoned for industrial use. The closest habitable residence is approximately 1/4 mile to the north-northwest of the Landfill. The Landfill and Foundry property is secure by fencing and an entrance gate to the Viking property.

The Landfill has been used as a disposal area for foundry waste generated at the Foundry since construction of the Foundry. These waste streams include green sand, isocure chemically bonded sand, and no bake sand. The site was undeveloped prior to that time. The Landfill operated as an unlined industrial landfill until 2014 when the unlined portion of the Landfill was closed and capped. Foundry sand is currently placed in lined cells with leachate collection. The cap of the initial industrial landfill serves as a lined cell to place additional foundry sand. Sand waste from Foundry is transported to the Landfill by dump truck. The foundry waste is spread and compacted, to an average in-place density of approximately 2,600 pounds per cubic yard.

The landfill is permitted by the Iowa Department of Natural Resources. Permit information is provided in Table 1.

Table 1 Permit Information

Permit Holder	Viking Pump, Inc.
Permit Number	07-SDP-12-89P-FSL
Responsible official and contact information	Evan Arachikavitz Viking Pump, Inc. 711 Viking Road (319) 222-2428

1.2 Regulatory Requirements

This Emergency Response and Remedial Action Plan (ERRAP) for the Landfill and is intended to fulfill the requirements of the Iowa Code Section 455B.306 (6) "d" and IAC Chapter 115.30. This ERRAP is referenced in the approved permit and will be updated as necessary with subsequent permit renewal applications.

2. Response and Remedial Actions to Emergency Conditions

2.1 Failure of Utilities

The leachate collection system (LCS) discharges to the wastewater sewer. In the event of a short-term failure (less than 48 hours), the LCS would not be compromised. The LCS is equipped with a submersible sump pump and load out system. In the event of a long-term failure of utilities (more than 48 hours), Viking would arrange for alternate

means of removing leachate from the sump which may use a backup generator to allow pump operation to discharge to the sanitary sewer.

2.2 Weather-related Events

The possibility of weather-related emergency conditions exists at the Landfill. Landfill personnel will take the following actions if weather-related emergency conditions arise.

2.2.1 Tornado

According to the National Weather Service (NWS) tornadoes occur in states such as Iowa during summer months when warm, moist gulf air extends northward. Tornadoes are usually accompanied by severe weather, which may include heavy rain, strong winds, and lightning. The NWS issues tornado watches when the conditions are favorable for a tornado to form. A tornado warning is issued when a tornado is either spotted or indicated by weather radar.

Operations at the Landfill will cease during severe weather. Landfill personnel are in radio or cell phone contact with the Foundry so they can be notified of impending weather. In the event of a tornado, personnel at the Landfill should seek immediate shelter. The Foundry is the nearest built shelter. If it is not possible to take shelter within the Foundry, it may be necessary to lie down in a ditch or low-lying area. When seeking shelter outside, the possibility of flooding should be taken into account.

After the tornado passes, the Landfill will be inspected for damage and cleanup activities will be completed to return the Landfill to normal operation as soon as safely possible.

2.2.2 Windstorms

The emergency conditions associated with windstorms are similar to those identified above for tornadoes.

Following any severe windstorms, the Landfill will be inspected for damage and cleanup activities will be completed to return the Landfill to normal operation as soon as safely possible.

2.2.3 Intense Rainstorms and Erosion

Intense rainstorms, which could result in significant erosion events, commonly accompany tornado-like weather. All erosion control structures have been designed according to a 25-year, 24-hour storm event. The emergency conditions associated with intense rainstorms are similar to those identified for tornadoes.

After the severe weather passes, the Landfill will be inspected for damage and cleanup activities will be completed to return the Landfill to normal operation as soon as safely possible. Erosion control structure repair may be required if the severe weather damaged the structures to a point of failure.

2.2.4 Lightning Strikes

Lightning commonly accompanies severe weather such as thunderstorms; however, according to the NWS, lightning strikes can occur as far away as 10 miles from any rainfall. To determine if the threat of lightning is in your area, the NWS suggests counting the seconds between sighting lightning and hearing thunder. If this time is 20 second or less, lightning is close enough to your area to be a threat.

When the potential for lightning is high, Landfill personnel should leave the area and seek shelter inside a large building. Since there are no buildings at the Landfill, the Foundry would be the nearest shelter. According to the NWS you should avoid open high ground and isolated large trees or poles during lightning strike events. If it is necessary to seek shelter outside, go to a low area such as a ravine or valley and remember to take the potential for flooding into account when seeking shelter.

After the severe weather passes, the Landfill will be inspected for damage and cleanup activities will be completed to return the Landfill to normal operation as soon as safely possible.

2.2.5 Flooding

When a flash flood warning is issued for the area of the Landfill, Landfill personnel should immediately go to high ground and leave areas that may be subject to flooding. Landfill personnel are in radio or cell phone contact with the Foundry so that they can be notified of flood conditions. After flood conditions have subsided, the Landfill will be inspected for damage and cleanup activities will be completed to return the landfill to normal operation as soon as safely possible.

2.2.6 Event and Post-Event Conditions

Landfill personnel will attempt to monitor the potential for weather-related emergency conditions while at the Landfill. This may include, but is not limited to, monitoring local weather stations, weather television stations, and visual observations of the sky and current weather conditions. Landfill personnel are also in radio or cell phone contact with the Foundry so they can be apprised of impending severe weather. Following any severe weather, the landfill will be inspected for damage and cleanup activities will be completed to return the Landfill to normal operation as soon as safely possible.

2.3 Fire and Explosions

2.3.1 Waste Materials

The only material accepted at the Landfill is foundry sand and baghouse dust generated at the Foundry. These are nonflammable, inorganic material is not associated with explosive landfill gases. Smoking and open burning is prohibited at the Landfill. The potential for fuel fires and explosions, associated with Landfill operating equipment, and grass fires exists at the Landfill.

2.3.2 Buildings and Site

Buildings have not been developed at the Landfill. Therefore, the potential for fire and explosion emergency conditions does not exist for buildings. The potential for grass or brush fires at the site does exist.

In the event of a grass or brush fire at the Landfill, personnel should first ensure their own safety. Once Landfill personnel safety has been ensured, the local fire department should be contacted to extinguish the fire. Landfill personnel are in radio or cell phone contact with the Foundry to request emergency assistance. After the fire is contained and extinguished, the Landfill will be inspected for damage and cleanup activities will be completed to return the Landfill to normal operation as soon as safely possible. An attempt will be made to determine the cause of the fire or explosion and steps taken to prevent future occurrences. If remedial actions are required, Viking will notify the IDNR of the incident and provide a summary of steps taken and planned to take to address environmental and safety concerns as warranted.

2.3.3 Equipment

The equipment used at the Landfill may include dump trucks, front-end loaders, bulldozers, and compactors. The potential for fuel fires or explosions associated with this equipment exists. Each vehicle is equipped with fire extinguishing equipment. In the event of a vehicle fire, Landfill personnel will first secure their own safety. Once Landfill personnel safety has been ensured, personnel will assess the situation and determine if the fire can safely be extinguished by personnel who have been trained how to properly use fire extinguishing equipment, or if necessary, contact the local fire department.

After the fire is contained and extinguished, the Landfill will be inspected for damage and cleanup activities will be completed to return the Landfill to normal operation as soon as safely possible. An attempt will be made to determine the cause of the fire and steps taken to prevent future occurrences.

2.3.4 Fuels

Emergency conditions associated with vehicle fuels exist for landfill operating equipment at the landfill. Emergency conditions that exist for fuels are addressed in a similar fashion to those discussed above for equipment.

2.3.5 Utilities

The risk for explosion or fire related to leachate discharge is very low as the leachate is not explosive.

2.3.6 Facilities

Facilities have not been developed at the Landfill, due to the close proximity of the Foundry; therefore, the potential for emergency conditions associated with facilities at the Landfill is not a concern.

2.3.7 Working Area

Working areas in the Landfill include the lined cell using landfill-operating equipment and recyclable waste recovery. Emergency conditions that exist for the Landfill operating equipment are addressed in a similar fashion to those discussed above for equipment.

2.3.8 Hot Loads

The only waste material accepted at the Landfill is waste foundry sand. This material is not flammable. Therefore, the potential for hot loads and fire or explosions associated with waste foundry sand is not a concern.

2.3.9 Waste Gases

The only waste material accepted at the Landfill is foundry sand. This material is not flammable and is not associated with explosive landfill gases; therefore, the potential for fires or explosions associated with waste gases from the Landfill is not a concern.

2.3.10 Evacuation

In the event of an evacuation of the Landfill, personnel will exit the Landfill using the safest route possible and report to the east entrance (Door 3) of the foundry building.

2.4 Regulated Waste Spills and Releases

For the purpose of this ERRAP, a release is considered to be an unplanned emission, discharge, spillage, or leakage of material at the Landfill. For the purpose of this ERRAP, an off-site release is considered to be a release of material, specifically intended for the Landfill, but not released on Landfill property while in transit to or from the Landfill. The only waste material regulated at the Landfill is the waste foundry sand.

2.4.1 Waste Materials

The foundry sand and baghouse dust are not considered a hazardous materials, are the only material accepted at the Landfill. In the event of a spill involving foundry waste, the material will be gathered up and placed into the current working area of the landfill.

2.4.2 Leachate

Waste placed prior to the construction of the lined expansion was exempt from implementing a leachate collection system for the Landfill through completion of a certified risk assessment of the Landfill. Wastes in the original footprint were covered with a final cover system that now serves as the bottom liner for new wastes. Leachate generated from wastes disposed after liner construction will be collected and removed from the Landfill. Collected leachate is discharged to the Cedar Falls sanitary sewer and treated as wastewater.

The potential for a release from a broken leachate transport pipe in the conveyance to the Cedar Falls sanitary sewer exists. In the event pipeline integrity is known or suspected of being compromised, the LCS will be turned off to prevent further release. A groundwater monitoring program is in place to address potential releases to groundwater.

2.4.3 Waste Gases

Waste foundry sand consists of inorganic material, which does not promote the production of landfill gases. Therefore, the potential for a release of waste gases from the Landfill is not a concern.

2.4.4 Waste Stockpiles and Storage Facilities

Upon entering the Landfill, dump trucks deposit the waste foundry sand in the working area. Front-end loaders or bulldozers spread the waste foundry sand to minimize the amount stored in stockpiles, as there are no storage facilities at the Landfill. The possibility of spills or releases associated with waste stockpiles and storage facilities is not a concern.

2.4.5 Waste Transport Systems

The Landfill is located adjacent to the Foundry and waste material does not leave Viking property to enter the Landfill. In the event of a waste foundry sand spill during transportation, the material will be gathered up and transported to the landfill.

2.4.6 Litter and Airborne Particulates

In order to reduce the amount of airborne particulate, the working face is wetted down, if necessary, to reduce fugitive dust emissions. In the case of baghouse dust the material will be placed on the landfill and covered immediately with foundry sand to minimize windblown material. Baghouse dust may be sprinkled with water to minimize material movement, Any water used to mitigate airborne dust would be collected by the liner and leachate collection system. The intent is to cover placed bagdust with foundry sand as soon as possible to minimize airborne dust.

2.4.7 Site Drainage Systems

Stormwater currently directed to the north generally flow overland and into an existing stream channel. Stormwater from the south side of the landfill is directed through a stormwater pond and to the City of Cedar Falls storm sewer system. Landfill construction prevent run-on of stormwater prevents pooling water along the toe of the Landfill.

2.4.8 Off-site Releases

The Landfill is located adjacent to the Foundry and the waste material never leaves Viking property; therefore off-site releases are not a concern.

2.5 Hazardous Material Spills and Releases

The only hazardous material that has the potential to be released at the landfill is fuel used for the operation of landfill equipment.

2.5.1 Load-Check Control Points

There are no load check control points at the Landfill. However, the operator visually inspects the load prior to final placement of waste to ensure no prohibited or hazardous wastes are placed within the Landfill.

In the event a prohibited item, or hazardous item is identified, Viking will ensure the item is removed from the waste and disposed of at a proper facility authorized to accept the hazardous or prohibited item.

2.5.2 Mixed Waste Deliveries

Waste generated at the foundry is the only material accepted at the Landfill and is not considered a hazardous material. Therefore, the potential for emergency conditions associated with mixed waste delivery spills or releases is not a concern.

2.5.3 Fuels

Since landfill operating equipment use internal combustion engines, the potential for emergency conditions associated with fuel spills or releases exist. In the event of a fuel release, an attempt will be made to safely contain the release. The Foundry will be notified immediately and will advise Landfill personnel on what further actions to take. A spill kit is maintained within the Foundry. A summary of the incident will be provided per SPCC requirements and follow up will be completed. The IDNR will be notified per protocols within Viking's SPCC plan.

2.5.4 Waste Gases

The waste generated at the foundry consists of inorganic material, which does not promote the production of landfill gases. Therefore, the potential for a release of waste gases from the landfill is not a concern.

2.5.5 Site Drainage Systems

The perimeter drainageway at the Landfill diverts surface water away from the Landfill to minimize stormwater run on into the landfill. Any precipitation that comes into contact with the waste will be contained and discharged to the Cedar Falls sanitary sewer via the liner system and LCS.

2.5.6 Off-Site Releases

The Landfill is located adjacent to the Foundry and the waste material never leaves Viking property; therefore, off-site releases are not a concern.

2.6 Mass Movement of Land and Waste

Mass movement of land or waste may occur at the landfill as a result of an earthquake, slope failure, waste shifts, or waste subsidence. In these instances, waste would not be released off-site.

2.6.1 Earthquakes

Although unlikely, the possibility of an earthquake does exist for the area. In the event of an earthquake, all activities at the Landfill will cease. During an earthquake Landfill personnel should move to an open area away from anything that may fall and cause injury. Aftershocks commonly occur after the earthquake has ended and Landfill personnel should be aware of this possibility and take precautions. Following the earthquake, the Landfill will be inspected for damage and, cleanup or repair activities will be completed so the landfill can resume normal activities as soon as safely possible.

2.6.2 Slope Failure, Waste Shifts, and Waste Subsidence

Foundry waste is spread and compacted into an average in-place density estimated to be 2,600 pounds per cubic yard. In the event of a waste shift, or waste subsidence, the Landfill will be inspected, and repairs completed as soon as safely possible. An attempt will be made to determine the cause of the mass movement and corrective measure will be taken to prevent any future occurrences.

A slope stability analysis has been completed and is presented in Appendix B of Tab 3 of Doc #82755. The slope stability analysis indicates under normal loading applications there is enough shear force resistance on the proposed liner material to provide adequate support to prevent slope failure for the lined areas.

2.7 Emergency and Release Notifications and Reporting

The following table includes relevant information for federal, state, local, and site individuals and agencies to contact in the event of an emergency.

Table 2 Emergency Contact List

Entity	Contact Information	Phone Number
Federal Agencies	National Response Center US EPA Emergency Response Region 7	(800) 424-8802 (913) 281-0991
State Agencies	IDNR Emergency Response IDNR Field Office No. 1 Manchester IDNR Water Quality Bureau Iowa Department of Public Safety Poison Control Information	(515) 204-3352 (563) 927-2640 (515) 725-8200 (515) 725-6000 (800) 222-1222
County and City Agencies	Police, Sheriff, Fire, Rescue Black Hawk County Emergency Management MercyOne Cedar Falls Emergency Care (see directions below): Take Viking Road west to Hudson Road, turn north on Hudson Road. Proceed on Hudson Road to W 4th Street, turning right onto W 4th Street. Continue on W 4th Street and hospital will be on your right (corner of W 4th and College Street). There are entrances to the parking lot on W 4th St and College Street.	911 (319) 291-4373 (319) 268-3000
Site Contacts	Evan Arachikavitz, Viking Margaret Zuckweiler, GHD	(319) 222-2428 (612) 382-2390
Local news media	KCNZ - Cedar Falls KBBG- Waterloo KFMW - Waterloo KWWL TV - Waterloo KWKB TV-Waterloo	(319) 277-1918 (319) 234-1441 (319) 234-5369 (319) 291-1240 (319) 643-5952
Public and private facilities with special populations within five miles	Cedar Heights Elementary School Hansen Elementary School Lincoln Elementary School North Cedar Elementary School	19) 553-2855 (319) 553-2783 (319) 553-2950 (319) 553-2810

Entity	Contact Information	Phone Number
	Orchard Hill Elementary School	(319) 553-2465
	Southdale Elementary School	(319) 553-2900
	Holmes Junior High	(319) 553-2650
	Peet Junior High	(319) 553-2710
	Cedar Falls High School	(319) 553-2500
	University of Northern Iowa	(319) 273-2311
	MercyOne Cedar Falls Emergency Care	(319) 268-3000

Issues that require remedial actions will be summarized and the IDNR will be informed of the circumstances and events of each incident.

2.8 Emergency Waste Management Procedures

Landfill personnel are in radio or cell phone contact with the Foundry so they can be notified emergencies.

If the Landfill is temporarily closed, foundry waste will be transported to the Black Hawk County Sanitary Landfill and deposited in accordance with a special waste authorization. If the Landfill will be closed for a longer period, Viking with coordinate with regulatory agencies and Black Hawk County Sanitary Landfill to develop a temporary operations plan or permit as needed.

If access to the Landfill is unavailable due to unforeseen circumstances, Viking will work to repair access or remove obstructions as needed. This may involve contracting services to a third-party that uses heavy equipment not available on site. If rerouting the haul route is possible, Viking will work to establish a temporary or permanent road to access the Landfill. If rerouting is not possible, foundry waste will be transported to the Black Hawk County Sanitary Landfill and deposited in accordance with a special authorization.

2.9 Primary Emergency Equipment Inventory

Viking will depend upon emergency first responders for emergency personnel and major equipment. There are no fire hydrants or water sources on the Landfill. The only emergency equipment Viking maintains at the Landfill is vehicle-mounted fire extinguishers and spill kits.

2.10 Emergency Aid

The contact information included above is a listing of all numbers to contact for emergency aid. Viking does not have a specific company contracted to respond to an emergency situation. In the event of an emergency situation requiring additional aid, Viking will acquire local contractors, as necessary.

2.11 ERRAP Training Requirements

Viking will provide Landfill personnel with appropriate initial and ongoing training and orientation for safe Landfill operation. Viking will maintain all relevant documentation pertaining to training that has been completed by employees for Landfill operation. An acknowledgement form is included in Appendix A of this ERRAP, which landfill personnel are required to read and sign, to confirm they have reviewed and understand this ERRAP.

Appendices

Appendix A

ERRAP Review Acknowledgement Form

ERRAP Acknowledgement Form for the Viking Pump Foundry Sand Landfill

This is to certify that I have reviewed and understand the procedures and requirements of this ERRAP. My failure to follow and comply with the requirements contained in this plan may result in disciplinary action and/or termination.

Print Name	Signature	Date

Appendix B

Slope Stability Analysis

INSPEC•SOL
ENGINEERING SOLUTIONS

MEMORANDUM

To: Margaret Zuckweiler, PE Date: June 4, 2014

From: Hassan Gilani Reference: 056934

Re: Slope Stability Analyses – Viking Pump Foundry Sand Landfill, Cedar Falls, Iowa

1.0 INTRODUCTION

The Viking Pump Station Landfill is located on South Main Street (Site or Property) in Cedar Falls, Black Hawk County, Iowa. Viking Pump manufactures metal pumps and related equipment using the Iron Alloy Foundries, generating foundry sand, which is disposed in the landfill located on the Viking Pump Property. It is estimated that approximately 8,000 tons of foundry sand (monofill) is disposed in the landfill per annum; contributions of the Iron and Alloy Foundries being approximately 88 and 12 percent, respectively.

Conestoga-Rovers & Associates (CRA) is preparing a permit renewal application package required for the continued operation of the landfill. The permit renewal application proposes to construct a cover over the existing wastes, allow wastes to be placed on top of the closed area and expand the landfill to the south. The purpose of proposing the cover design over the existing waste and expansion to the south is to meet Iowa Department of Natural Resources (IDNR) new rules that require all monofills to be closed and any new monofill cells to be lined. As final elevations have not yet been reached in the existing footprint area, the design allows continued use of the remaining capacity. Additionally the expansion to the south will add 2.3 acres for a total area for basegrade of 6.5 acres. Prior to the cover installation at side slopes of 3 Horizontal to 1 Vertical (3H:1V), the existing landfill will be re-graded to allow installation of a leachate collection system to allow for continued placement of foundry sand to permitted final elevations.

This memorandum prepared by Inspec-sol Inc., the geotechnical division of CRA provides a summary of the geotechnical evaluation of the global stability of the proposed permanent side slopes (global slope stability) of the completed landfill at 3H:1V. The geotechnical assessment of the proposed landfill cap at 3H:1V side slope has also been carried out with respect to stability of the cap components against sliding over the geosynthetic elements in the proposed final cap, hereafter referred to as the veneer slope stability.

The geotechnical slope stability evaluations are based on the following documents:

1. Hydrogeological Investigation Report, Viking Pump Foundry sand Landfill dated May 1992 (Revised March 1995) prepared by Montgomery Watson;
2. Completed Landfill Plan and Cross-Sections A-A, B-B and C-C provided by CRA;
3. Limited Laboratory Geotechnical Test Results

2.0 SUMMARIZED SUBSURFACE SOIL AND GROUNDWATER CONDITIONS

A review of the logs of the monitoring wells MW-8, MW-13 and MW-14 installed in or close to the landfill footprint shows that the soils below the landfill are generally comprised of sandy silty clay deposits that extend to depths of approximately 60 ft. The sandy silt clay deposits are shown to be interbedded with sand and gravel layers in MW-8, but these layers are not shown in the logs of MW13 and MW-14 indicating that the sand and gravel layers are laterally discontinuous.

A review of the laboratory test results shows that the sandy silt clay deposits are comprised of 0 to 6 percent gravel (>4.75 mm) 16 to 45 percent sand (4.75 to 0.074 mm) and percent fines (<0.074 mm) range from 52 to 84 percent. The Atterberg Limits analyses results shows that the Liquid Limit (LL) of the soil samples range from 27 to 29 and Plasticity Index (PI) values range from 10 to 13. Based on the grain size and Atterberg Limits test results, the samples have been classified as sandy lean clay (CL) using the Unified Soil Classification System (USCS) as described in ASTM D2487.

CRA monitored the groundwater levels in the existing monitoring wells at the Site in September 2013. The groundwater was measured in monitoring wells MW8, MW13 and MW14 at elevations of 925.68, 913.63 and 936.68 ft. Above Mean Sea Level (amsl) below the landfill base levels. The significant variation in the groundwater elevations also indicates that a free groundwater table is not present, which is consistent with the low permeability sandy lay soil deposits, and the observed water levels are indicative more of the localized perched conditions.

3.0 GLOBAL STABILITY EVALUATION

3.1 General

Global stability refers to the potential of a slope to undergo a relatively deep seated circular failure. The side slopes of the landfill are proposed to be constructed at a 3H:1V. The slope stability analyses of the proposed landfill side slope configuration have been carried out to evaluate the stability of the planned 3H:1V slopes.

3.2 Analyses Methodology and Software

The slope stability analyses were performed using the Morgenstern & Price Method using the module Slope/W of the computer software Geo-Studio 2012 developed and distributed by Geo-Slope International Ltd.

3.3 Cross-Sections Analyzed

Five cross-sections of the landfill, A-A, B-B, and C-C shown on the attached CRA Drawing 56394- dated June 4, 2014, depicting the final closure conditions of the landfill, were selected for global slope stability analyses. The locations of the cross-sections are also shown on the above referenced drawing. At each cross-section location opposite side slopes of the landfill were analyzed for stability as shown on Figures 1 to 6 attached.

The cross-sections were selected based on a combination of subsurface conditions and the above grade landfill slope geometry that would result in representative conditions. The cross-sections were analyzed for the proposed closure conditions to determine the relative effect of the proposed horizontal and vertical expansion on the landfill slopes.

3.4 Material Properties

The properties required for the stability analyses of the slopes are the bulk densities and shear strength parameters of the materials involved. Relevant geotechnical properties comprising bulk density and shear strength of the different subsoil units have been determined from the available laboratory analyses and literature search and are shown on the graphical outputs of the slope stability analyses attached as Figures 1 to 6 with this memorandum, and the rationales for selecting these values are discussed below.

The material contained in the existing and the final closure landfill slopes will be comprised of foundry sand. Foundry sand is typically high quality silica sand used in the molding and casting operations with a small addition of bentonite to act as the binder material. Chemical binders are also used. Depending on the use of bentonite and/or chemical binders, the foundry sand can comprise of 85 to 99 percent silica sand and 0 to 12 percent clay, which are finer than 0.002 mm. CRA has provided a grain size analysis of a sample of the foundry sand which shows that the sample is comprised 5 percent gravel sized particles, 91 percent sand sized particles and 4 percent fines passing the No. 200 sieve (0.074 mm). A review of the Federal Highway Authority (FHWA) publication FHWA-IF-04-004 dated May 2004 'Foundry Sand Facts for Civil Engineers' shows that the bulk density of loosely placed foundry sand with little or no clay can range from 80 to 90 pounds per cubic feet (pcf). The shear strength parameters of angle of internal friction (φ) and cohesion can range from 30 to 36 degrees (^{o}) and cohesion 'c' can range from 3700 to 6100 pounds per square feet (psf). For the purposes of these analyses, foundry sand has been divided into old and new foundry sand materials. Old foundry sand which be consolidated by the load imposed by the new foundry sand placed on top of it has been assigned slightly higher shear strength properties than the new foundry sand albeit still conservative values when compared to the FHWA publication values.

The underlying clayey soils are low to medium plasticity soils with PI values of 10 to 13. A literature search shows that the natural undisturbed clayey soils with PI of 10 to 13 have drained φ of 25 to 35^o with c in the range of 1000 to 2000 psf. For the purposes of these analyses, conservative parameters of φ of 28^o and c of 200 psf have been assumed.

3.5 Piezometeric Conditions

Piezometeric surfaces, if passing through the soil mass above the critical slip circle/plane, affect the results significantly. The natural groundwater is generally below the base of the landfill, and has been included in the analyses at generally 1 ft below the base of the landfill. Groundwater is generally more than 1 foot for much of the landfill basegrade.

The significant variation in the groundwater elevations in the existing monitoring wells at the Site indicates that a free groundwater table is not present, which is consistent with the low permeability sandy lay soil deposits, and the observed water levels are indicative more of the localized perched conditions.

The landfill itself has leachate collection and disposal system installed in the cells, which is capable of handling 1 in 100 years storm event, and has been designed to maintain leachate head levels less than 1 inch above the basegrade. As such no leachate accumulation in the

cells in anticipated, however a leachate head up to elevation 947 ft. AMSL has been conservatively included in the analyses to see if this head will affect the stability of the existing berms and the overlying closed landfill.

3.6 Minimum Factors of Safety

A factor of safety (FS) in slope stability analysis can be defined as the ratio of the available shear strength to that of the applied stresses along a potential failure plane. A factor of safety of 1 or greater indicates stable conditions and a value of less than 1 represents unstable conditions. A value of 1.5 was targeted for the static analyses.

3.7 Slope Stability Evaluation Results

The graphical outputs of the slope stability analyses are provided on Figures 1 to 6. The global stability analyses were generally comprised of finding the most critical circular slip plane; the critical slip plane being the slip plane for which the minimum factor of safety can be calculated. A review of the slope stability analyses results shows that at all locations factors of safety of more than 1.5 were achieved for the proposed 3H:1V.

In view of the conservative soil parameters assumed for the analysis, the proposed landfill side slopes at 3H:1V are considered to be stable.

4.0 VENEER (COVER) SLIDING STABILITY

The final cover system could comprise either of the following two alternatives in a top-to-bottom order:

Cover System Component	Component Thickness and/or type
Vegetative Layer	6 inches
Protective Layer	General Fill – 18 inches
Composite Drainage Layer	Geonet(1)
Impermeable Layer	40 mil textured HDPE
Subgrade	Foundry Sand

(1) The geonet will consist of a plastic grid core sandwiched between two layers of non-woven geotextile.

The cover system sliding stability analyses were performed using the infinite slope methodology for the critical interfaces between the geosynthetic layers and between geosynthetic layers and landfill soils or cover system soils. The interface shear strength parameters have been assumed based on the literature review and past experience with similar components.

Due to the relative steepness of the 3H:1V slope and presence of the composite drainage layer no water head is expected to develop over the landfill cap that could impact the sliding stability of the overlying general fill and topsoil layer.

The interface shear strength parameters used and the results of the analyses are presented in Table 1. A review of Table 1 shows that for the assumed interface-shear strength parameters and conditions, the calculated factors of safety of 1.5 or more is achieved for the proposed 3H:1V side slopes.

Figure 1
Cross-Section A-A
Global Stability Analyses
East Side Slope
Viking Pump Foundry Sand Landfill
Cedar Fall, Iowa

CRA Project No. 056934

Name: Old Foundry Sand Unit Weight: 90 pcf Cohesion: 50 psf Phi: 32 °
Name: New Foundry Sand Unit Weight: 80 pcf Cohesion: 50 psf Phi: 28 °
Name: Native Clay Unit Weight: 110 pcf Cohesion: 200 psf Phi: 28 °

Asssumed Leachate level shown is conservative - no leachate mounding is expected

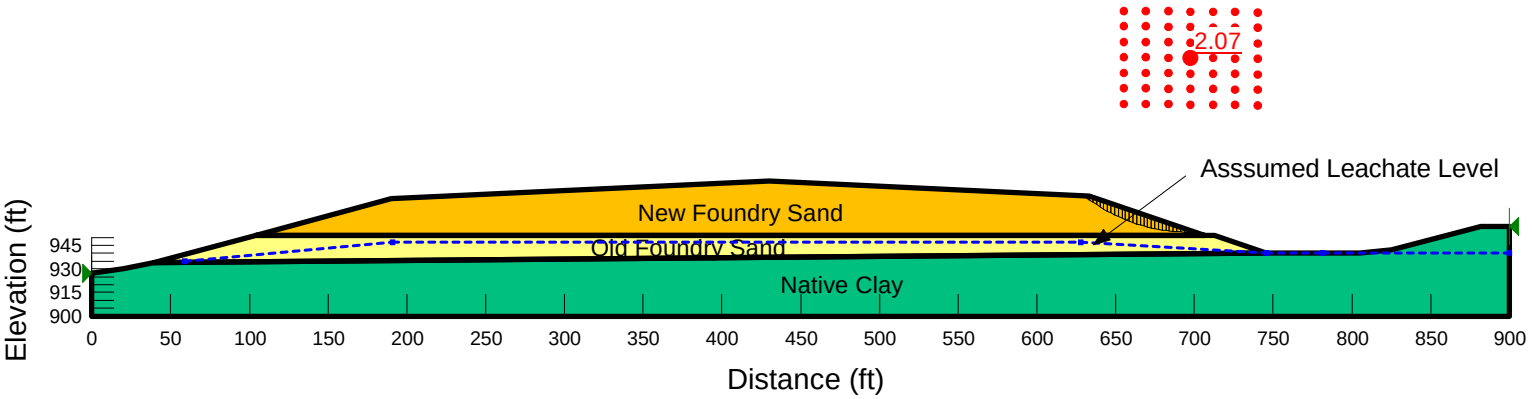


Figure 2
Cross-Section A-A
Global Stability Analyses
West Side Slope
Viking Pump Foundry Sand Landfill
Cedar Fall, Iowa

CRA Project No. 056934

Name: Old Foundry Sand Unit Weight: 90 pcf Cohesion: 50 psf Phi: 32 °
Name: New Foundry Sand Unit Weight: 80 pcf Cohesion: 50 psf Phi: 28 °
Name: Native Clay Unit Weight: 110 pcf Cohesion: 200 psf Phi: 28 °

Asssumed Leachate level shown is conservative - no leachate mounding is expected

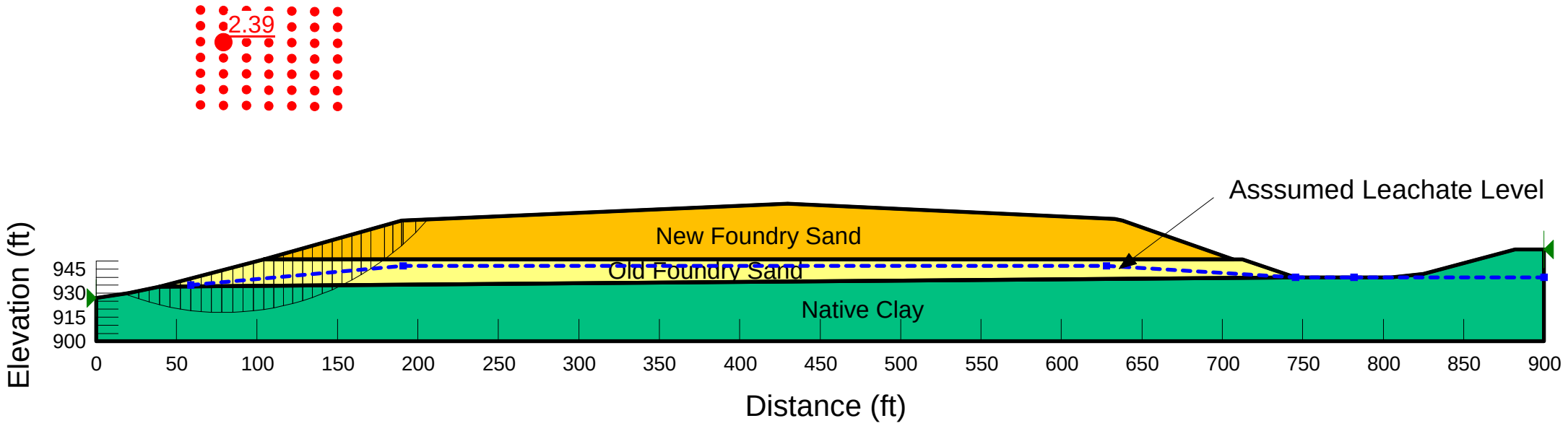


Figure 3
Cross-Section B-B
Global Stability Analyses
East Side Slope
Viking Pump Foundry Sand Landfill
Cedar Fall, Iowa

CRA Project No. 056934

Name: New Foundry Sand Unit Weight: 80 pcf Cohesion: 100 psf Phi: 28 °
Name: Native Clay Unit Weight: 110 pcf Cohesion: 200 psf Phi: 28 °

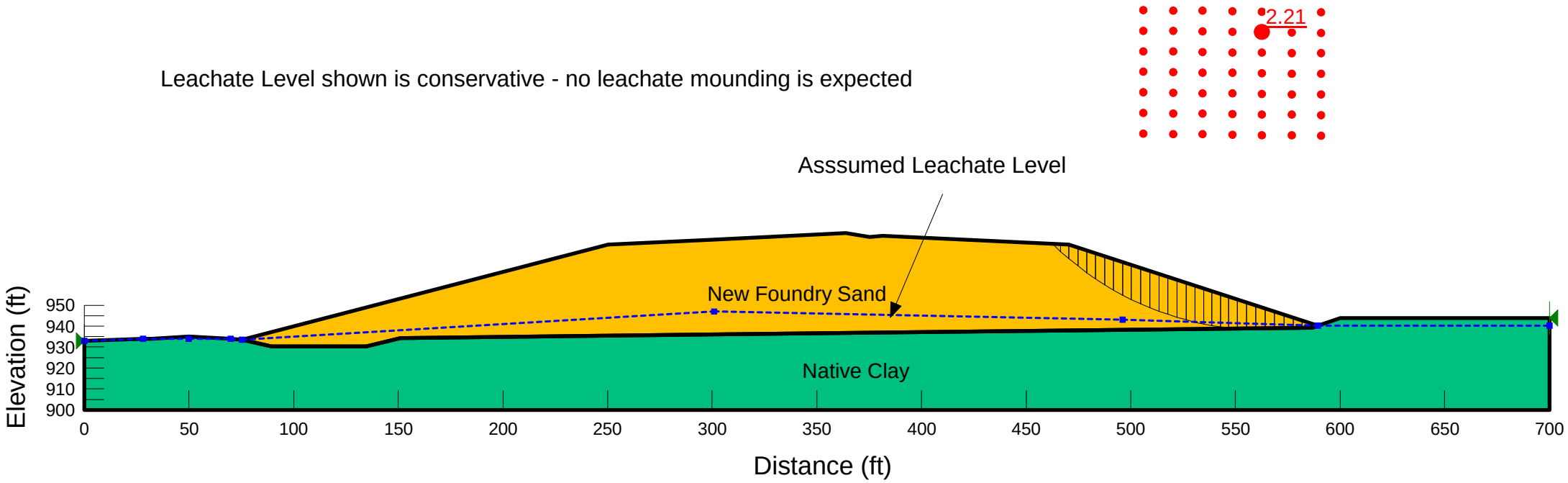
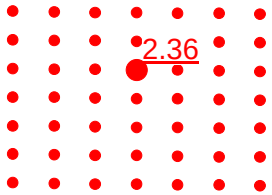


Figure 4
Cross-Section B-B
Global Stability Analyses
West Side Slope
Viking Pump Foundry Sand Landfill
Cedar Fall, Iowa

CRA Project No. 056934



Name: New Foundry Sand Unit Weight: 80 pcf Cohesion: 100 psf Phi: 28 °
Name: Native Clay Unit Weight: 110 pcf Cohesion: 200 psf Phi: 28 °

Leachate Level shown is conservative - no leachate mounding is expected

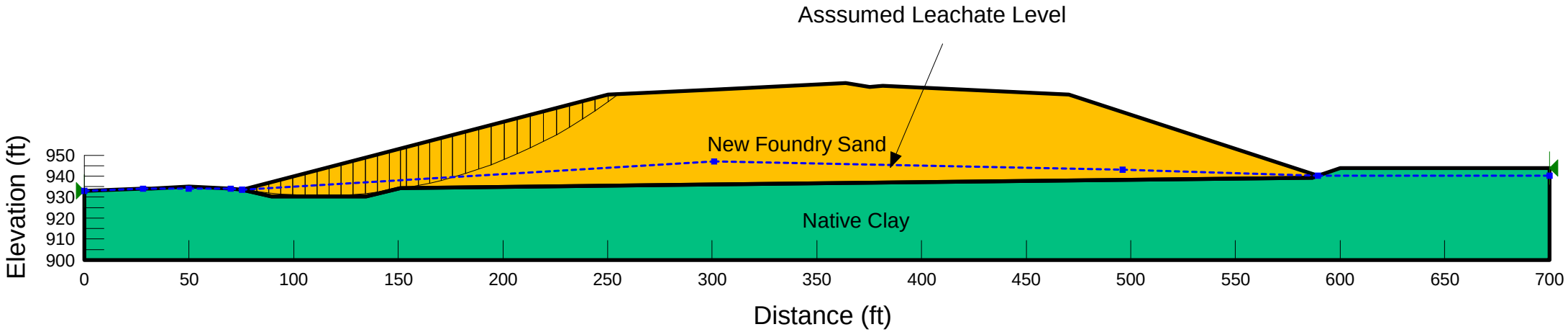


Figure 5
Cross-Section C-C
Global Stability Analyses
South Side Slope
Viking Pump Foundry Sand Landfill
Cedar Fall, Iowa

CRA Project No. 056934

Name: Old Foundry Sand Unit Weight: 90 pcf Cohesion: 50 psf Phi: 32 °
Name: Native Clay Unit Weight: 110 pcf Cohesion: 200 psf Phi: 28 °

Asssumed Leachate level shown is conservative - no leachate mounding is expected

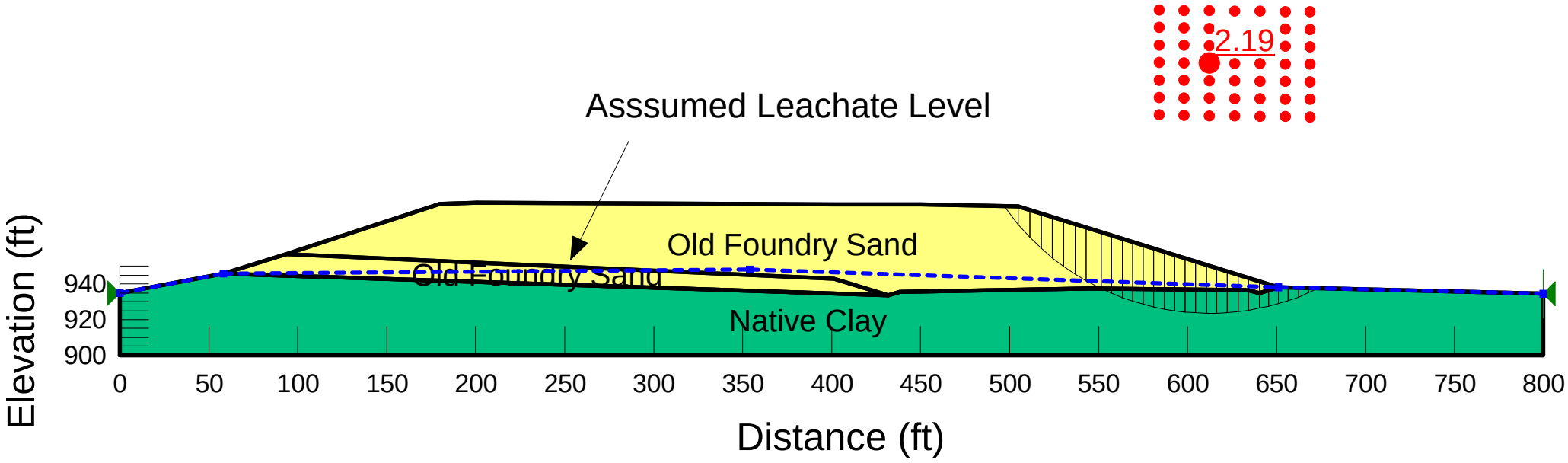


Figure 6
Cross-Section C-C
Global Stability Analyses
North Side Slope
Viking Pump Foundry Sand Landfill
Cedar Fall, Iowa

CRA Project No. 056934

Name: Old Foundry Sand Unit Weight: 90 pcf Cohesion: 50 psf Phi: 32 °
Name: New Foundry Sand Unit Weight: 80 pcf Cohesion: 50 psf Phi: 28 °
Name: Native Clay Unit Weight: 110 pcf Cohesion: 200 psf Phi: 28 °

Asssumed Leachate level shown is conservative - no leachate mounding is expected

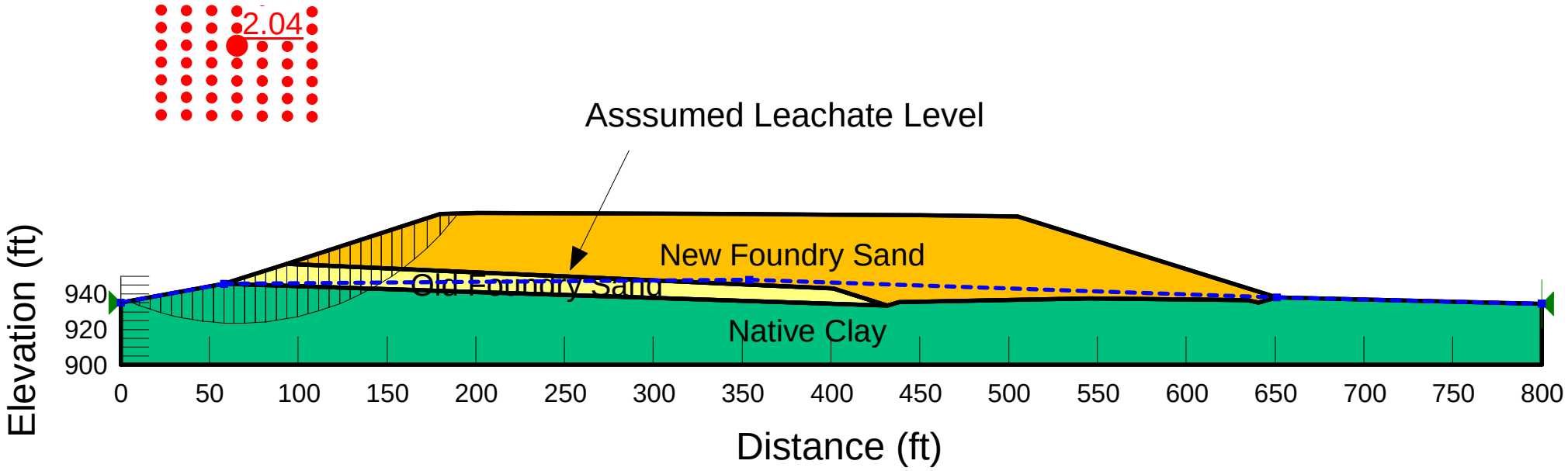


TABLE 1

COVER STABILITY ANALYSES - 4H:1V SIDE SLOPE
VIKING PUMP FOUNDRY SAND LANDFILL, CEDAR FALLS, IOWA

Critical Interface	*Cover Density* γ *(lbs/ft^3)*	*Cover Soil Thickness (ft)*	*Depth to Failure plane z (ft) (Note 1)*	*Depth to Water* d_w *(ft) (Notes 1, 2)*	*Interface Shear Strength*		*Landfill Slope* β		*Factor of Safety*
					Cohesion c (psf)	*Angle of friction (* ϕ *)*	*H:V*	*Degrees*	
0.5 ft Vegetative Layer + 1.5 ft Protective Layer Vs 12 Ounce Nonwoven Geotextile (upper face of geonet)	120	2.00	2.11	2.11	0	26	3.0 :1	18.4	1.5
12 Ounce nonwoven Geotextile (lower face of geonet) Vs 40 mil textured LLDPE Liner	120	2.00	2.11	2.11	0	28	3.0 :1	18.4	1.6
40 mil Textured HDPE liner Vs Landfill Foundry Sand	120	2.00	2.11	2.11	0	26	3.0 :1	18.4	1.5

Factor of Safety (FS) =

$$\frac{c/(\gamma.z.\cos^2\beta) + \tan\phi\,[1-\gamma_w(z-d_w)/(\gamma.z)] - k_s \tan\beta \tan\phi}{k_s + \tan\beta}$$

γ_w (density of water lb/ft^3) = 62.4

1) Depth to critical surface/water measured vertically from the ground surface.
2) Water depth of 2" assumed over the geonet.
3) The calculated factors of safety are based on assumed interface friction values from published technical-literature, and must be confirmed by Site-specific laboratory testing.

ghd.com

→ The Power of Commitment