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**PROPOSED ON-SITE
LANDFILL FEASIBILITY STUDY
Vermilion Power Plant
Oakwood, IL**

Submitted to

Dynegy Midwest Generation, LLC

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Submitted by

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November 2021

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EXECUTIVE SUMMARY

A new on-site landfill (New Landfill) is being considered to be constructed in the area of the retired power plant at the Vermilion Power Plant (Power Plant Property¹). The power plant will be demolished, and substructures will be removed. The New Landfill will meet the state requirements of 35 Illinois Administrative Code (IAC) Part 811 and the applicable federal requirements of 40 Code of Federal Regulations (CFR) Part 257 Subpart D (Federal CCR rule). The New Landfill will have an approximate 27-acre waste footprint and a 40-acre facility footprint (Facility), which encompasses the associated haul roads and space needed for ditches, a stormwater basin, and leachate structures. The New Landfill will have sufficient disposal “air space” to accommodate the needs of the on-site ash pond closure by removal construction and power plant demolition. The Feasibility Study (FS) will summarize the following:

1. An overview of the New Landfill;
2. Evaluation of applicable landfill location standards;
3. Description and details of the New Landfill environmental control systems including: bottom liner system, leachate collection system, stormwater management, final cover system, and cell layout; and
4. Evaluation of other design elements, including location overview, geology and hydrogeology, uppermost aquifer, excavation, stability, construction, and landfill filling schedule, source material management, operating plan, long-term leachate management, landfill gas management (not applicable), access road, and closure and post-closure care.

¹ Power Plant Property includes the area of the power plant, ancillary areas, a cooling lake, and nearby CCR surface impoundments.

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SECTION 1

INTRODUCTION

This FS evaluates the feasibility of the conceptual design of the New Landfill under consideration at Power Plant Property. This FS is presented in support of a closure alternatives analysis (CAA) that is being prepared in accordance with 35 IAC Part 845.710(b)². The CAA is being conducted for the closure of the following coal combustion residual (CCR) surface impoundments: Old East Ash Pond area (OEAP)/North Ash Pond area (NAP), and New East Ash Pond (NEAP). The CAA and this FS will be included in the Final Closure Plan prepared under Part 845.720(b) that is a part of the ash ponds closure Construction Permit Applications prepared under Part 845.220.

The New Landfill under consideration will contain CCR material generated on-site by the Owner's own activities such as: closure by removal of existing CCR surface impoundments and non-hazardous wastes from demolition and clean-up of a retired coal fired power plant. Therefore, it will be necessary to meet the requirements of Section 21(d)(1) of the Illinois Environmental Protection Act (IL Act) which does not require local siting approval for municipal solid waste landfills and CCR surface impoundments when the wastes generated by the person's own activities are disposed of within the site where such wastes are generated.

The New Landfill under consideration must meet the technical and permitting requirements of 35 IAC Part 811. The New Landfill is expected to meet the requirements of 35 IAC Part 811 and applicable Federal CCR rule requirements based on this FS and Geosyntec's experience. Documentation demonstrating compliance with 35 IAC Parts 811 and 812 will be performed through submittal of a permit application to Illinois Environmental Protection Agency (IEPA).

The New Landfill under consideration will be located where the current power plant and associated structures stand and to the area west of the plant structures. The power plant and its structures will be removed prior to development of the New Landfill. The New Landfill under consideration will be bordered by existing site roads to the north and south. A stormwater basin is proposed to be located southwest of the New Landfill and the existing southern access road. The New Landfill location under consideration is depicted in **Figure 1**.

² Illinois Pollution Control Board, Title 35: Environmental Protection, Subtitle G: Waste Disposal, Chapter I: Pollution Control Board, Subchapter j: Coal Combustion Waste Surface Impoundments, April 2021.

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SECTION 2

EVALUATION OF LANDFILL LOCATION STANDARDS

The Illinois location standards for the New Landfill under consideration are established in 35 IAC Sections 811.102³ and 811.302⁴. Additional federal requirements for CCR units under 40 CFR Part 257 Subpart D will also be addressed. **Table 1** summarizes the Illinois and Federal CCR rule location standards. The New Landfill under consideration meets the requirements of state and federal location standards based on currently available data. It is expected that all location standards will be verified following additional studies such as a wetland delineation, archaeological survey, and other studies. The Facility boundary is shown on **Figure 1**.

Location Standards	Setback Requirements	Regulatory Citation	Meets	Does Not Meet	Requires Additional Evaluation	Notes
Airport	<ul style="list-style-type: none">• 10,000-foot setback from any runway with turbojet aircraft• 5,000-foot setback from any runway with piston aircraft• Notify FAA if within 5 miles of airport runway• 6-mile setback for new landfills for public use airports designed for 60 passengers or less	35 IAC 811.302 (c) and (f) Wendall Ford Act (49 U.S.C. 44718(d))	X			The nearest airport is the Vermilion County Airport, which is located over 7 miles to the northwest of the New Landfill.
Floodplain	The facility shall not be located in 100-year floodplain	35 IAC 811.102 (b)	X			The New Landfill is approximately 108-feet above and 1,200-feet outside of the 100-year floodplain based on a 2021 Inundation Map from Illinois State LiDAR data.

³ Subpart A: General Standards for all Landfills

⁴ Subpart C: Putrescible and Chemical Waste Landfills

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Table 1 Illinois Landfill Location (35 IAC 811) and Federal CCR Landfill Location Standards (40 CFR Part 257 Subpart D)						
Location Standards	Setback Requirements	Regulatory Citation	Meets	Does Not Meet	Requires Additional Evaluation	Notes
Placement above the uppermost aquifer	Five feet above the upper limit of the uppermost aquifer	§257.60	X		X	The proposed New Landfill excavation grades will range from 672 ft MSL on the north end of each cell to approximately 668 ft MSL on the south side. The estimated uppermost aquifer elevation (based on 2011 borings) is estimated to be at least 135 feet below ground surface in the vicinity of the New Landfill. The uppermost aquifer will have to be confirmed during the hydrogeologic investigation.
Wetlands/Waters of U.S.	The facility shall not cause a violation of Section 404 of the Clean Water Act	35 IAC 811.102(e) And §257.61	X		X	Based on the developed nature of the Facility and its location (uplands) there is a low probability of the existence of wetlands. A wetland delineation study will be performed on the New Landfill area as part of the IEPA permitting process.
Fault	The landfill unit will not be located within 200 feet of a Holocene fault	35 IAC 811.304 And §257.62	X			There are no Holocene faults within 200 feet of the New Landfill.
Seismic Impact Zones	The facility shall not be located in a seismic impact zone (10% or greater chance of exceeding 0.10 g in 250 years) unless all containment structures are designed	35 IAC 811.304 And §257.63	X			The peak ground acceleration is 0.0806g at the Facility; and therefore, the New Landfill is not in a seismic impact zone.
Unstable Areas	The facility shall not be located in an unstable area unless engineering measures have been incorporated	35 IAC 811.305 And §257.64	X		X	There are no reported karst areas near the Facility. Coal mining was previously performed near the Vermilion River. Previous studies indicate that mining was adjacent to the River. A site-specific investigation will be included in the hydrogeologic investigation in the New Landfill IEPA permit application.

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Table 1 Illinois Landfill Location (35 IAC 811) and Federal CCR Landfill Location Standards (40 CFR Part 257 Subpart D)						
Location Standards	Setback Requirements	Regulatory Citation	Meets	Does Not Meet	Requires Additional Evaluation	Notes
Wild and Scenic Rivers	The facility shall meet all requirements under the Wild and Scenic River Act	35 IAC 811.102(a)	X			The Middle Fork of the Vermilion River is designated as a wild and scenic river. Based on correspondence from the National Park Service, they recommend landfill development outside of a ¼ mile radius of national wild or scenic rivers. The final design of the landfill unit footprint or boundary can and will be located outside of this setback.
Historic and Natural Areas	The facility shall not be located in areas where it may pose a threat of harm to historical or natural area as designated as a Dedicated Illinois Nature Preserve.	35 IAC 811.102	X		X	The EcoCAT survey identified several historic or natural areas within the vicinity of the New Landfill. The nearest historic or natural area is the Kickapoo State Recreation Area located 0.5 miles south. A Phase I Archaeological Survey is recommended for the New Landfill to verify that no historic or natural areas are present in the New Landfill facility boundary.
Endangered Species	The facility shall not be located in areas where it may jeopardize the continued existence of endangered species	35 IAC 811.102 (d)	X			Multiple protected resources were identified in the vicinity of the project location per an EcoCAT due to the Middle Fork of the Vermilion River but not within the proposed New Landfill area. The design report, CQA and operating plans, that will be developed during the IEPA permitting process, will include documentation on how the New Landfill will not impact endangered species.
Water Quality Management Plan	The facility shall not cause a violation of any area-wide or state-wide water quality management plan	35 IAC 811.102(f)	X			The New Landfill design will incorporate stormwater design elements that will improve existing stormwater quality.

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Table 1 Illinois Landfill Location (35 IAC 811) and Federal CCR Landfill Location Standards (40 CFR Part 257 Subpart D)						
Location Standards	Setback Requirements	Regulatory Citation	Meets	Does Not Meet	Requires Additional Evaluation	Notes
Water Supply Wells Setback	<ul style="list-style-type: none"> • LF unit, 200 feet for off-site water supply wells • LF Unit, 2,500 feet from a community supply well (Section 14.2 and 14.3) 	35 IAC 811.302(a)	X			The nearest community supply well is in Danville located over four miles (>20,000 ft) to the east.
Sole-Source Aquifers	No part of the LF unit shall be located within 1,200 feet vertically or horizontally of a sole source aquifer, unless an impermeable situation exists below the unit.	35 IAC 811.302(b)	X			The Mahomet aquifer is designated as a sole source aquifer and is within 1 mile of the New Landfill, but the proposed New Landfill is outside of the regulatory 1,200-foot setback.
Road and Highways	The facility must have a 500-foot setback of any county road, state, or interstate or have operations screened by a barrier	35 IAC 811.302 (c)	X			The New Landfill will be designed and developed with a 500-foot setback from all county, state or interstate roads.
Occupied Dwellings, Schools, Hospitals, Etc.	The landfill unit must have a 500-foot setback unless special permission is granted by the owner.	35 IAC 811.302 (d)	X			The New Landfill will be designed and developed with a 500-foot setback from all occupied dwellings, schools, hospitals, etc. There are no schools or hospitals within 4,600 feet of the proposed New Landfill area.

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SECTION 3

LANDFILL CONCEPTUAL DESIGN

3.1 Design Overview

The conceptual layout of the New Landfill under consideration is shown on **Figures 2 and 3**. The estimated waste footprint or boundary is approximately 27 acres. The New Landfill will provide a waste volume of approximately 3,100,000 cu yds of “airspace” (i.e., storage volume). The Landfill may accept an estimated 50,000 cubic yards (cy) of material from the coal yard, 2,163,000 cy of coal combustion residuals (CCR) from the North Ash Pond area (NAP) and Old East Ash Pond area (OEAP) closure⁵, 376,000 cy of CCR from the New East Ash Pond (NEAP) closure, and 35,000 cy of non-hazardous construction demolition debris from the demolition of the power plant. The total waste volume includes an approximate 20 percent contingency in waste volume capacity.

The design elements of the proposed New Landfill have been implemented at many other modern landfill facilities and have demonstrated to be protective of the public health, safety and welfare and compliant with Illinois landfill regulations. All landfill design and construction elements will be overseen and certified by a third party licensed professional engineer in the State of Illinois. Some of the design features of the New Landfill under consideration include:

- **Composite Bottom Liner System** – The proposed New Landfill will be designed with a composite liner system consisting of a minimum three-foot thick, low permeability soil liner. The low permeability soil liner will be installed in lifts and compacted to achieve a permeability no greater than 1×10^{-7} cm/sec. The three-foot thick compacted soil liner will be overlain by a 60-mil thick high-density polyethylene (HDPE) geomembrane liner.
- **Leachate Collection System (LCS)** – The liquids that come into contact with the waste are defined as “leachate” or “contact water” and are managed so these liquids do not impact groundwater or surface water sources. The New Landfill under consideration will be designed with a one-foot-thick granular drainage layer or a geocomposite drainage layer that will be installed directly above the composite bottom liner system. The leachate collection system will drain to collection points (i.e., leachate sumps) located along the

⁵ A portion of the OEAP area and NAP area are co-located over the southern end of NAP and northern end of OEAP and are considered as one surface impoundment for the construction permit.

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base of the landfill. The conceptual design (see **Figure 2**) has five leachate sumps, associated with five landfill cells, located on the southern edge of the New Landfill.

Contact water during construction will be pumped from the sumps to either a leachate pond or above ground storage tank(s) located adjacent to the landfill. The leachate will be discharged through either of the Facility's NPDES permitted outfall(s). The NPDES permit would require a modification should it receive landfill contact water/leachate. After closure, the leachate will be managed and discharged either through the Power Plant Property's NPDES permitted outfall(s) or transported to a permitted wastewater treatment plant (WWTP).

- **Final Cover System** – The final cover system will cover the entire New Landfill and will tie-into the bottom liner system at the perimeter to fully encapsulate the waste mass. The final cover system design will include a low permeability layer to prevent precipitation from entering the waste mass to minimize leachate generation. The low permeability layer will consist of two components: (1) 1-foot low permeability cohesive soil/clay layer, and (2) 40-mil linear low-density polyethylene (LLDPE) geomembrane. A geocomposite drainage layer will be installed directly on top of the geomembrane if necessary, to minimize the liquid head on the final cover system, thereby reducing final cover infiltration and improving stability of the final cover system. A three-foot protective cover soil layer will be placed over the geocomposite drainage layer. The upper six inches of the protective cover soil layer will be suitable for supporting vegetation. The final cover will be vegetated. Any stormwater runoff that occurs after placement of the one-foot-thick low permeability cohesive soil/clay layer will be non-contact stormwater.
- **Disposal Cell Layout** – The New Landfill will incorporate five cells, oriented from west to east. The bottom liner will be graded in a sawtooth configuration to promote the flow of leachate from north to south and prevent ponding. The side slopes of the bottom liner and LCS grades will be constructed at 3H:1V. The LCS pipe will be sloped from an approximate elevation of 674 ft MSL at the southern end of Cell 1 and 672 ft MSL at the southern end of Cells 2 through 5, up to an elevation of 676 ft MSL at the northern end of each cell. Leachate in each cell will drain at a minimum 2.0 percent slope to a center LCS pipe in each cell. The LCS pipes will slope at a minimum 1.0 percent from north to south to a sump located at the south end of each cell. The sumps will be located at an approximate elevation of 672 ft MSL.

The final waste elevation will be approximately 811 ft MSL (see **Figure 3**), and the final cover will be constructed to a maximum elevation of 815 ft MSL with an upper plateau slope of 20H:1V and maximum side slopes of 3H:1V. The side slopes may be reduced to 4H:1V if the required waste volume is less than currently anticipated during CCR surface impoundment closure.

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Figure 4 shows the conceptual New Landfill cross section and depicts the slopes and elevations of the proposed New Landfill.

3.2 Evaluation of Design Elements

The following evaluation is provided for the elements of the geologic setting, landfill design, operations, closure and post-closure.

- **Geologic Setting – Unconsolidated Deposits** – During the spring of 2021, borings were completed for new groundwater monitoring wells (MW-101, -102, -103, -104, and -105), which surround the New Landfill under consideration. The borings (**Appendix A**) show the foundation soil underlying the New Landfill primarily consists of clay alluvium. The soils are generally lean clays and silty clays with varying amounts of sand and gravel ranging from very soft to hard with an average of being very stiff. Laboratory testing indicates that the clay alluvium exhibits an average vertical hydraulic conductivity less than 1×10^{-6} cm/sec.

There are thin and discontinuous seams of sand alluvium present in the clay alluvium. The sand alluvium consists of fine to coarse-grained sands and gravels. The shallow sand alluvium around the New Landfill is monitored and located at elevations between approximately 617 to 654 feet above mean sea level (ft MSL). While the shallow sand alluvium may contain groundwater, it is not the uppermost aquifer for the Power Plant Property, as it is discontinuous and not used as a water supply. The deep sand alluvium around the New Landfill corresponds with the lower groundwater unit (LGU) and is monitored and located at elevations 540 to 561 ft MSL. The LGU is considered to be the uppermost aquifer under the New Landfill.

- **Uppermost Aquifer** – While the Power Plant Property consists of various localized groundwater bearing units, the uppermost aquifer at the Facility is the LGU. The LGU underlies most of the alluvial deposits and is located above the bedrock. The top of the bedrock is up to 150 feet below the ground surface in the area of the New Landfill.
- **Groundwater Flow** – There are three groundwater units under the Power Plant Property: the upland groundwater unit (UGU), middle groundwater unit (MGU) and LGU. Based on the 2012 hydrogeologic study in the area of the OEAP, the UGU is located between elevations 565 and 552 ft MSL (discontinuous), the MGU is between 586 and 559 ft MSL, and the LGU is between 563 and 536 ft MSL. The MGU and LGU are the primary water bearing units at the Power Plant Property. They are comprised of alluvial sands and gravel and glacial outwash. Groundwater at the New Landfill flows through the LGU from west to the east on the west side of the New Landfill and from north to the south on the east side of the New Landfill, before discharging to the existing Illinois Power Company Lake

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located south of the New Landfill. Groundwater levels are expected to fluctuate due to seasonal changes, precipitation events, and other factors. A hydrogeologic evaluation and groundwater impact assessment model will be completed for the New Landfill as part of the IEPA permit application.

- **Location** – The New Landfill will be located such that it meets the airport, floodplain, uppermost aquifer, wetlands/waters of the U.S., fault zone, seismic impact zone, unstable area, wild and scenic rivers, historic and natural areas, endangered species, water quality management plan, wet supply well setback, sole-source aquifer, road and highway, and occupied dwellings, schools, and hospitals location standards. The waste boundary of the New Landfill will be located 50 feet off the boundary of the access roads to allow for construction of perimeter ditches and groundwater monitoring well installation. The waste boundary will also be located away from any active utility easements. Additional evaluations will be completed to fully demonstrate compliance with the 35 IAC Part 811 and Federal CCR rule location standards.
- **Long Term Floodplain Impacts** – Geosyntec reviewed the historical aerial imagery, flood study data, geomorphology, geotechnical data, and proximity of the Middle Fork of the Vermilion River (River). Geosyntec’s conclusion is that the location of the proposed New Landfill is in a stable location and not prone to be impacted by future meandering and erosion by the River.

The River alignment and geologic floodplain have been constrained historically by the floodplain bluffs (sometimes referred to as alluvial terraces and valley walls) shown in historical imagery and topographic data dating back to 1940. The floodplain bluffs were formed at the end of the Pleistocene Epoch (end of the last period of glaciation around 11,000 years ago). **Figure 5** provides a delineation of the floodplain bluff alignment near the proposed New Landfill location.

The existing ground surface elevation at the Landfill is approximately 700 ft. The ground surface elevation of the River overbank is approximately 590 ft. The water surface elevation of the 1,000-year flood event is 600 ft. The New Landfill will be approximately 100-feet in elevation above the River’s 1,000-year flood event elevation (see **Appendix B**) and 110 ft above the current floodplain elevation of 590 ft. The nearest adjacent floodplain bluff is located approximately 650-feet northeast of the proposed New Landfill location, which is approximately 750-feet horizontally away from the River channel right descending bank. The proposed New Landfill would be located approximately 1,400-feet horizontally from the River.

There has been no evidence, based on the geomorphology of the valley since the River channel was formed at the end of the Pleistocene Epoch, showing that the River has ever

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flowed through the location of the proposed New Landfill or overtopped the valley wall, and it is not expected to ever move significantly beyond the floodplain bluffs/valley walls.

- **Excavation** – The New Landfill will be constructed by first excavating down to a subgrade with the intention of using excavated soils in construction of the low permeability bottom and final liner system, cover protective layer and other berms and site features. The soils that were encountered in borings were silt, low plasticity clays that are suitable for low the expected purposes. Further, it is necessary that the design provide sufficient excavation volume for construction material, but it is not necessary to have a balanced cut and fill because any excess fill may be sold or used in the backfilling of excavations for the closure by removal of the surface impoundments. The preliminary cut and fill indicate an excess of 1,325,000 cu yd of fill.
- **Stability** – The stability of the excavation, side slopes, veneer (liner interfaces with different layers), and top cover grades have been selected with a high degree of confidence they will meet geotechnical criteria based on the on-site material properties and the properties of the expected manufactured layers. Geotechnical testing of the different materials at the Power Plant Property was completed and the summary data tables of the results of the investigation are presented in **Appendix A**. Based on a review of the material properties of the on-site foundation soils, it is Geosyntec’s experience that the proposed New Landfill under consideration will meet the slope stability and settlement requirements. Further, it does not appear that there are any layers of loose saturated sand or silt that may be susceptible to liquefaction. Geotechnical calculations will be completed as part of the New Landfill design in the IEPA permit application and the design will be revised, if necessary, to meet the regulatory requirements.
- **Construction and Landfill Filling Schedule** – It is anticipated that site investigation, design and review for the proposed New Landfill will take a number of years. The New Landfill construction and filling will begin in the western most cell and progress to the east to allow plant demolition to occur simultaneously. It is estimated that construction and filling (approximately 3,100,000 cu yds of materials) of the landfill are estimated to take approximately 6 years. The closure of the landfill (approximately 27 acres) will occur as different areas reach final top of waste design elevations and will occur over a period of approximately two years.
- **Source of Materials** – The bottom liner soil layer, protective soil layer in the final cover system, daily cover, and intermediate cover materials are anticipated to be obtained primarily from on-site excavated soils from within the New Landfill footprint. The initial geotechnical laboratory data (**Appendix A**) and field boring log information indicates that excavated soils for landfill development are predominantly low plasticity silty clays and are suitable for these materials.

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- **Operating Plan** – The facility will develop and implement an operating plan that meets the applicable landfill regulatory requirements under 35 IAC Part 811. All employees will be trained and managed to comply with the contents of the operating plan. The operating plan will discuss waste placement, cover materials and placement, leachate and stormwater management, dust controls maintenance program, and emergency procedures that will be implemented at the New Landfill to provide worker’s safety and minimize impacts to on-site workers and the surrounding properties.
- **Long-Term Leachate Management** – The proposed New Landfill design includes a LCS to remove liquids from below the CCR and will be designed to minimize the formation of leachate and to prevent leachate from coming into contact with either surface water or groundwater sources. The New Landfill under consideration will be designed with the following elements to decrease potential precipitation infiltration and resulting leachate formation: (1) cover and landfill phasing practices, (2) intermediate and final landfill waste grading, and (3) final cover system. The final cover system will be placed as soon as practicable to minimize stormwater infiltration and reduce contact water runoff.
- **Stormwater Management** – The Owner will design, install and operate a stormwater management plan that meets all state and local requirements. Through the use of perimeter berms, rain flaps and diversion ditches, stormwater will be diverted around active landfill areas to the proposed stormwater basin located southwest of the Cell 1. After closure, the final grading plan and cover system will isolate precipitation (i.e., non-contact stormwater) and thereby significantly reducing leachate generation during post-closure.
- **Landfill Gas Management** – The New Landfill will primarily consist of CCR material; however, it will consist of some inert, non-hazardous construction demolition debris, and coal yard residuals. Gas generation at the New Landfill is anticipated to be minimal and a gas system may be incorporated, if necessary.
- **Access Road** – The existing access roads to the north, west and south of the proposed landfill will continue to be used and will provide access for filling, maintenance, and inspection purposes.
- **Closure and Post-Closure Care** – The New Landfill IEPA permit application will include closure and post-closure care plans that will describe how the New Landfill will be closed and what activities will be performed during post-closure care. The post-closure care plan will describe the maintenance, monitoring and inspection programs for the New Landfill during the post-closure care period. The anticipated post-closure care period for the New Landfill will be 30 years.

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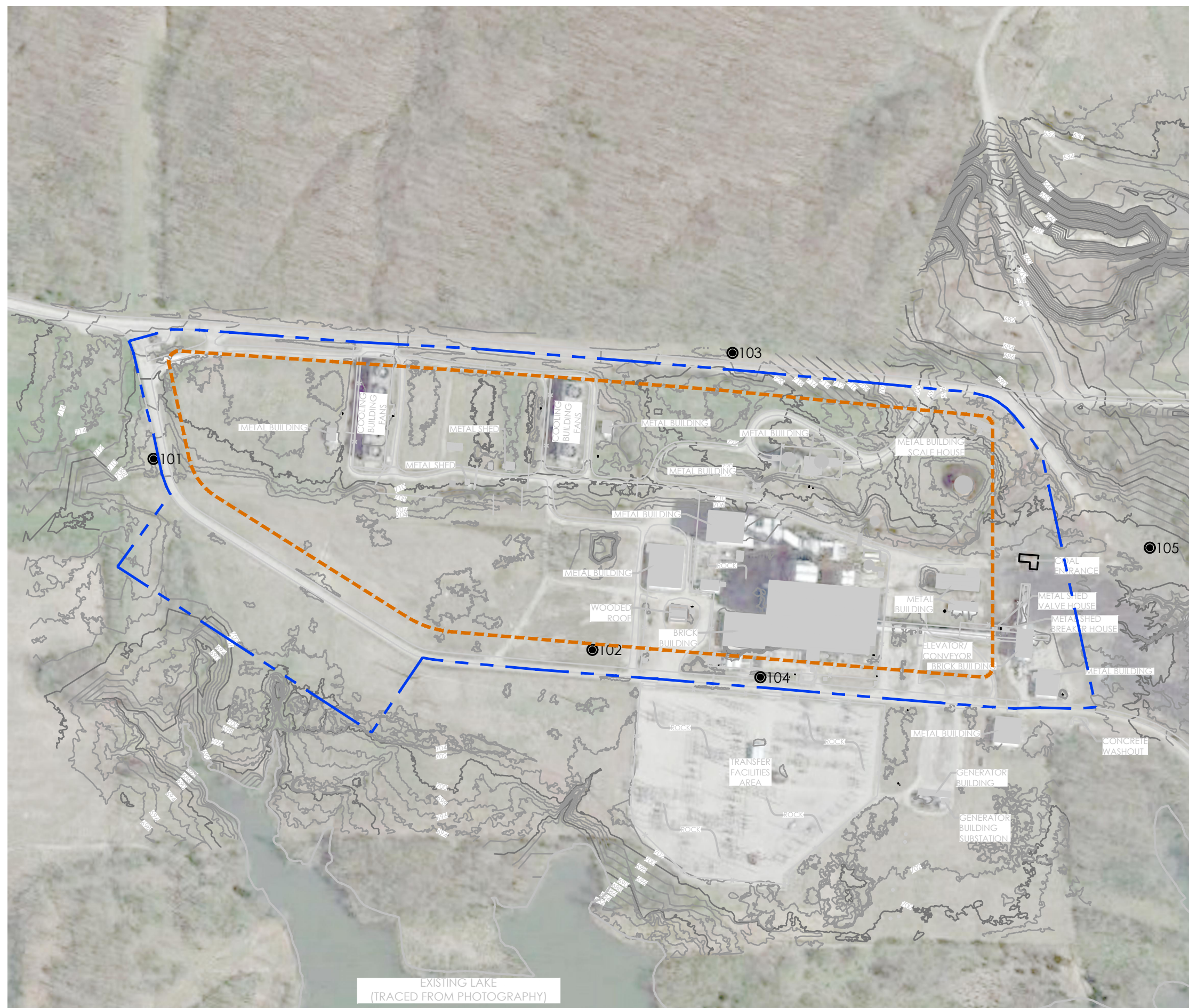
SECTION 4

CONCLUSIONS

Geosyntec has performed a FS at the New Landfill located on the conceptual Facility in support of the CAA. The conceptual design meets the requirements of 35 IAC Part 811 and applicable Federal CCR rule regulations. Additional studies and assessments will be conducted to verify that all of the location standards are fully met. Further documentation demonstrating compliance with 35 IAC Parts 811 and 812 will be performed through submittal of a permit application to the IEPA.

Based on a Geosyntec's understanding of Facility conditions, the conceptual New Landfill design, and the location demonstrations currently completed, it is Geosyntec's professional opinion that the New Landfill will meet the criteria of 35 IAC Part 811 and 40 CFR Part 257 Subpart D, and can be feasibly constructed, filled, and closed at the Power Plant Property.

FIGURES

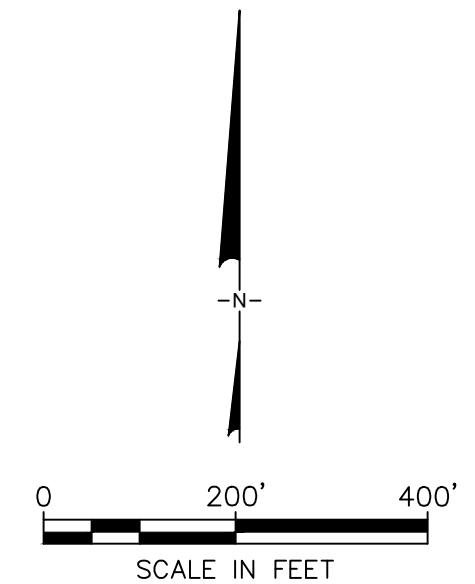


LEGEND

- - - - - PROPOSED FACILITY BOUNDARY
- - - - - PROPOSED WASTE BOUNDARY
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING MONITORING WELL BORING LOCATION

NOTES:

1. THE DATE OF AERIAL IMAGE IS APRIL 20, 2019 OBTAINED FROM GOOGLE EARTH PRO.
2. SURROUNDING TOPOGRAPHY OBTAINED FROM 06-21-2021 SURVEY.
3. ALL LAYOUTS ARE CONCEPTUAL AND WILL CHANGE WITH FINAL DESIGN.



CONCEPTUAL NEW LANDFILL
VERMILION POWER PLANT
EXISTING CONDITIONS



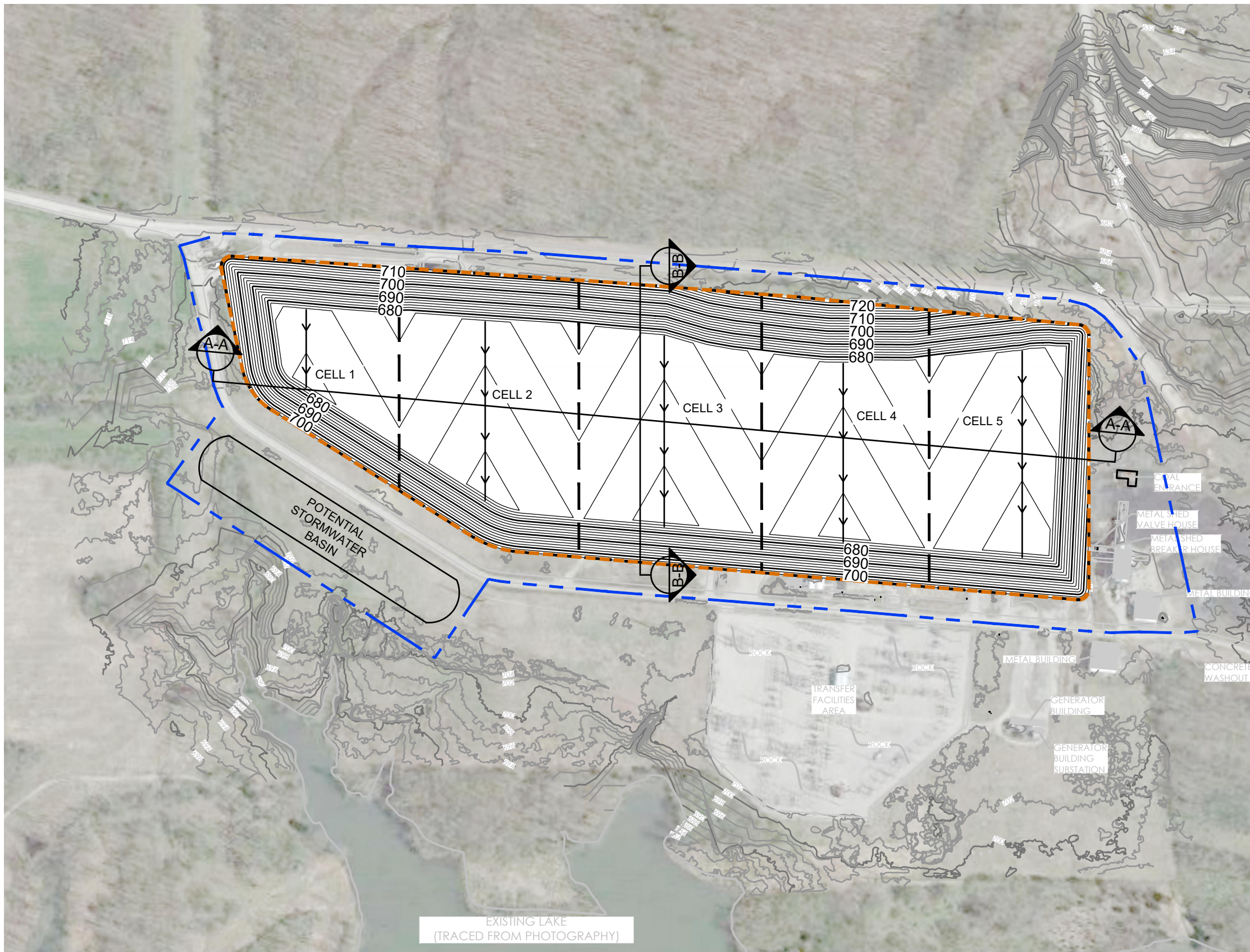
FIGURE

1

PROJECT NO: CHE8404

AUGUST 2021

S:\Company\Projects_post_2014\CHE8404_VPS_Closure_RIA_Sprt1900 - CAD\Drawings\Landfill\New Landfill - Draft_081821.dwg

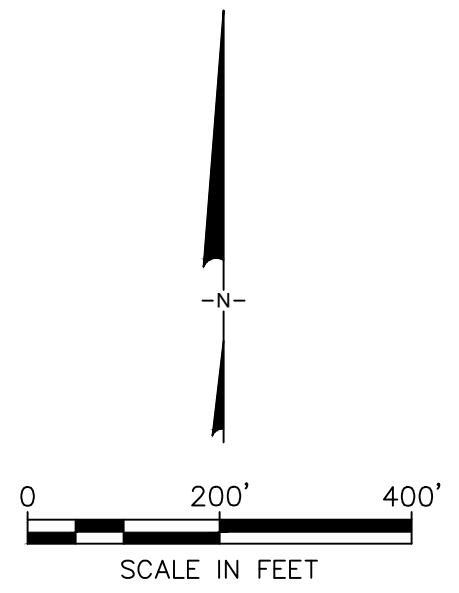


LEGEND

- - - - - PROPOSED FACILITY BOUNDARY
- - - - - PROPOSED WASTE BOUNDARY
- — — — — CONCEPTUAL LCS MAJOR CONTOUR
- — — — — CONCEPTUAL LCS MINOR CONTOUR
- — — — — EXISTING MAJOR CONTOUR
- — — — — EXISTING MINOR CONTOUR
- ← ← ← APPROXIMATE LCS PIPE FLOW DIRECTION
- - - - - APPROXIMATE CELL BOUNDARY

NOTES:

1. THE DATE OF AERIAL IMAGE IS APRIL 20, 2019 OBTAINED FROM GOOGLE EARTH PRO.
2. SURROUNDING TOPOGRAPHY OBTAINED FROM 06-21-2021 SURVEY.
3. ALL LAYOUTS ARE CONCEPTUAL AND WILL CHANGE WITH FINAL DESIGN.



Cut/Fill Summary

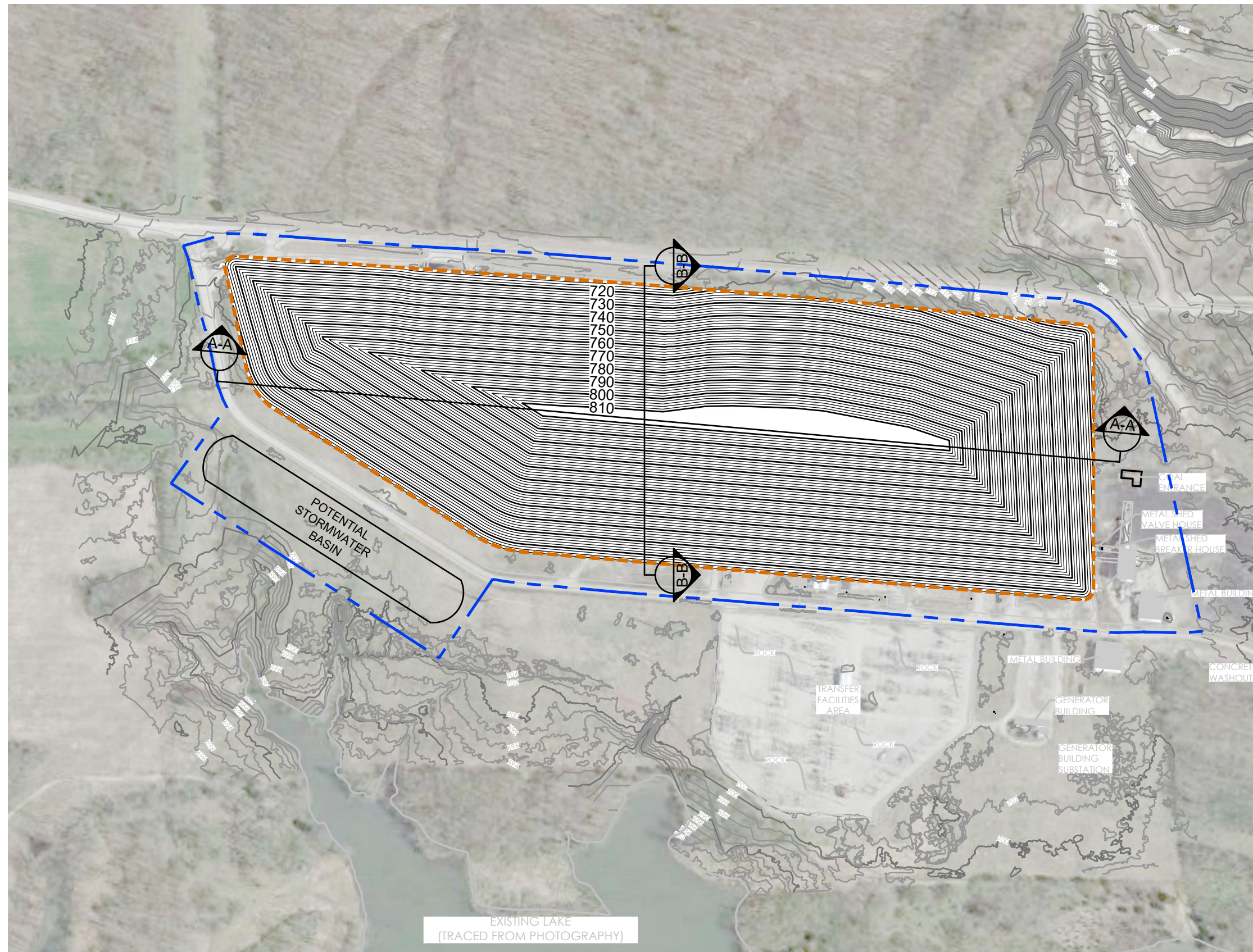
Name	Cut	Fill	Net
volume - total waste	0.00 Cu. Yd.	3137619.31 Cu. Yd.	3137619.31 Cu. Yd.<Fill>
Totals	0.00 Cu. Yd.	3137619.31 Cu. Yd.	3137619.31 Cu. Yd.<Fill>

CONCEPTUAL NEW LANDFILL
VERMILION POWER PLANT
TOP OF LCS



FIGURE
2

PROJECT NO: CHE8404
AUGUST 2021

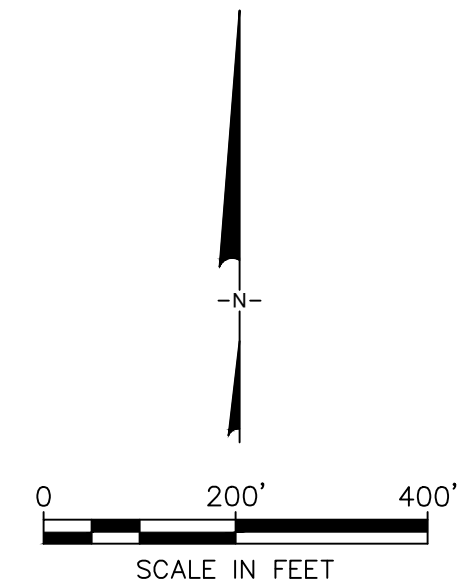


LEGEND

- - - - - PROPOSED FACILITY BOUNDARY
- - - - - PROPOSED WASTE BOUNDARY
- — — — — CONCEPTUAL WASTE MAJOR CONTOUR
- — — — — CONCEPTUAL WASTE MINOR CONTOUR
- — — — — EXISTING MAJOR CONTOUR
- — — — — EXISTING MINOR CONTOUR

NOTES:

1. THE DATE OF AERIAL IMAGE IS APRIL 20, 2019 OBTAINED FROM GOOGLE EARTH PRO.
2. SURROUNDING TOPOGRAPHY OBTAINED FROM 06-21-2021 SURVEY.
3. ALL LAYOUTS ARE CONCEPTUAL AND WILL CHANGE WITH FINAL DESIGN.



Cut/Fill Summary

Name	Cut	Fill	Net
volume - total waste	0.00 Cu. Yd.	3137619.31 Cu. Yd.	3137619.31 Cu. Yd.<Fill>
Totals	0.00 Cu. Yd.	3137619.31 Cu. Yd.	3137619.31 Cu. Yd.<Fill>

CONCEPTUAL NEW LANDFILL VERMILION
POWER PLANT TOP OF WASTE



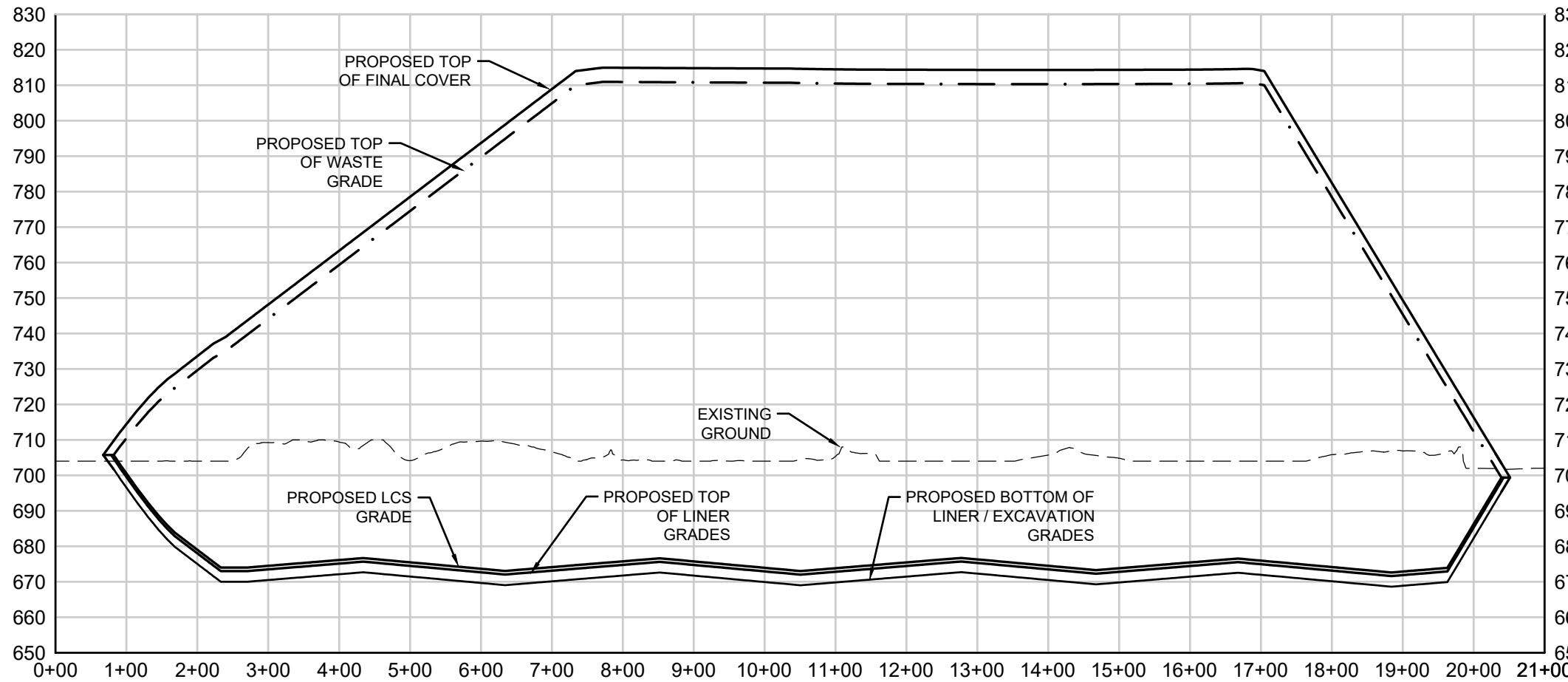
FIGURE

3

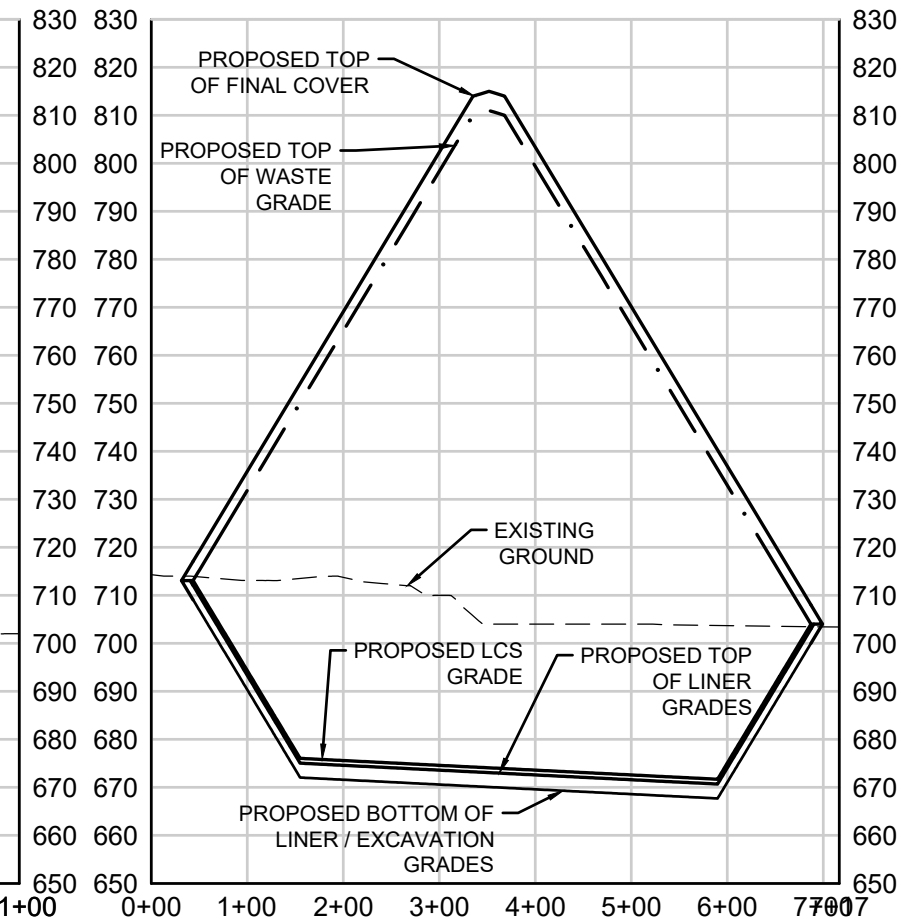
PROJECT NO: CHE8404

AUGUST 2021

S:\COMPANY\PROJECTS_POST_2014\CHE8404_VPS_CLOSURE_RIA_SVRT1900 - CAD\DRAWINGS\LANDFILL\NEW LANDFILL - DRAFT_081821 - Last Saved by: OCovert on 8/26/21



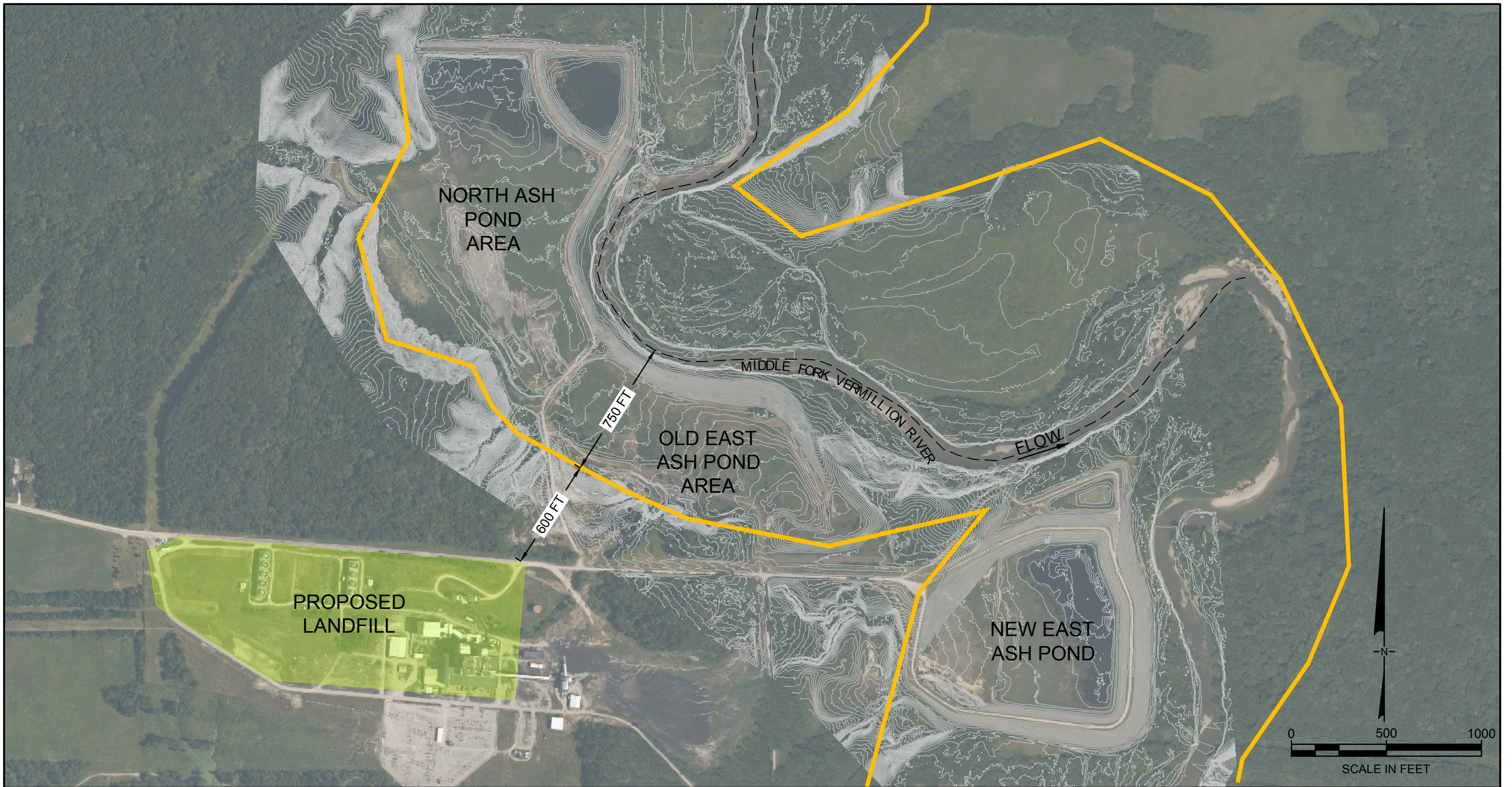
SECTION B-B
HORIZONTAL: 1" = 200'
VERTICAL: 1" = 40'



SECTION B-B (1)
HORIZONTAL: 1" = 200'
VERTICAL: 1" = 40'

CONCEPTUAL NEW LANDFILL VERMILION POWER PLANT SITE CROSS-SECTIONS	
	FIGURE 4
PROJECT NO: CHE8404	AUGUST 2021

C:\PROJECTS\VERMILION\ICHE8404B-FLOODPLAIN BLUFFS\ICHE8404B-001 FIGURE - Last Saved by: Mkatelava on 10/29/21



LEGEND

- EXISTING MAJOR CONTOUR (10- FT INTERVAL)
- EXISTING MINOR CONTOUR (2- FT INTERVAL)
- MIDDLE FORK VERMILION RIVER CENTERLINE
- FLOODPLAIN BLUFFS

CONCEPTUAL NEW LANDFILL
 VERMILION POWER PLANT
 VERMILION COUNTY, ILLINOIS



FIGURE

5

PROJECT NO: CHE8404B

OCTOBER 2021

APPENDIX A
FIELD AND LABORATORY DATA

Table A: Geotechnical Laboratory Testing Results
Vermilion Power Plant
Oakwood, IL

Boring Number	Depth (feet)	ASTM D2216 Moisture Content (%)	ASTM D7263 Dry Unit Weight (pcf)	ASTM D4318 Atterberg Limits			ASTM D1140 Percent Passing No. 200	ASTM D2487 USCS Symbol	ASTM D5084 Hydraulic Conductivity (cm/sec)	ASTM D2435 1-D Consolidation		ATSTM D4767 Consolidated - Undrained Triaxial Compression Test	
				Liquid Limit	Plastic Limit	Plasticity Index				Primary Compression Index, CC	Maximum Past-Pressure (psf)	Effective Stress Friction Angle, Φ (degrees)	Total Stress Friction Angle, Φ (degrees)
MW-101	10-12	15.6	--	22	15	7	82.2	CL-ML	--	--	--	--	
MW-101	30-32	13.3	124.2	--	--	--	--	--	--	--	31	23	
MW-101	32-33	15.3	--	28	15	13	85.5	CL	--	--	--	--	
MW-101	60-62	12	127.4	--	--	--	--	--	1.0E-07	--	--	--	
MW-101	62-63	11.9	--	24	13	11	75.7	CL	--	--	--	--	
MW-101	92-93	11.4	--	25	13	12	71.3	CL	--	--	--	--	
MW-101	132-133	11.3	--	20	12	8	54.0	CL	--	--	--	--	
MW-102	10-12	16.2	--	28	16	12	83.9	CL	--	--	--	--	
MW-102	28-30	14.9	--	24	14	10	81.7	CL	--	--	--	--	
MW-102	30-32	15	120.6	--	--	--	--	--	1.6E-08	--	--	--	
MW-102	60-62	12.5	127.0	--	--	--	--	--	--	--	31	27	
MW-102	62-64	12.4	--	24	14	10	73.4	CL	--	--	--	--	
MW-102	94-96	9.2	--	27	14	13	70.8	CL	--	--	--	--	
MW-102	130-132	10.2	--	20	12	8	54.0	CL	--	--	--	--	
MW-103	10-12	15	--	28	16	12	84.7	CL	--	--	--	--	
MW-103	15-17	16.6	116.8	30	15	15	85.3	CL	3.61E-08	-	-	-	
MW-103	28-30	13.5	--	21	13	8	69.8	CL	--	--	--	--	
MW-103	30-32	13.2	125.2	--	--	--	--	--	6.1E-08	--	--	--	
MW-103	60-62	15.8	118.00	--	--	--	--	--	--	--	31	20	
MW-103	88-90	15.9	--	28	15	13	84.8	CL	--	--	--	--	
MW-103	90-91	18.1	111.8	--	--	--	--	--	--	0.027	6219	--	
MW-103	95.5-96	13.9	128.4	17	10	7	51.8	CL-ML	9.35E-06	-	-	-	
MW-103	102-104	10.2	--	23	12	11	62.1	CL	--	--	--	--	
MW-103	130-131	8.9	98.8	16	11	5	12.6	SC-SM	2.19E-05	-	-	-	
MW-103	132.5-133	15.3	95.2	14	7	7	5.7	SP-SC	8.17E-05	-	-	-	
MW-103	138-140	10.5	--	21	11	10	56.5	CL	--	--	--	--	
MW-103	140.5-141	10.8	127.5	23	11	12	57.4	CL	3.82E-07	-	-	-	
MW-103	163-163.5	13.8	109.5	17	11	6	35.2	SC-SM	4.31E-06	-	-	-	
MW-104	10-12	14.5	--	26	15	11	81.8	CL	--	--	--	--	
MW-104	30-32	15.2	119.7	--	--	--	--	--	--	0.056	5154	31	
MW-104	60.5-61	12.4	--	20	13	7	70.9	CL-ML	--	--	--	--	
MW-104	92-94	9.5	--	25	13	12	64.7	CL	--	--	--	--	
MW-104	130-132	12.1	--	20	12	8	55.0	CL	--	--	--	--	
MW-105	10-12	25.2	97.0	--	--	--	--	--	--	0.156	4600	28	
MW-105	17-19	24.8	--	44	19	25	97.4	CL	--	--	--	--	
MW-105	28-30	17.8	--	39	17	22	96.9	CL	--	--	--	--	
MW-105	58-60	12.9	--	22	13	9	73.0	CL	--	--	--	--	
MW-105	88-90	10.5	--	25	12	13	65.9	CL	--	--	--	--	
MW-105	130-132	10.2	--	20	12	8	50.4	CL	--	--	--	--	

Notes:

1. Source of data is from the May 7, 2021 Laboratory Testing Services for the Vermilion Landfill Feasibility Investigation received from Geotechnology, Inc.
2. The primary compression index was calculated by Geosyntec based on the one-dimensional consolidation of soils (ASTM D2435) test results.



- 2021 MONITORING WELL LOCATION
- PROPOSED STAFF GAUGE
- PROPOSED BORING (LOCATION COLLECTED WITH GPS)
- 2019 ANTIDEGRADATION LOCATION
- EXISTING MONITORING WELL LOCATION
- APPROXIMATE PROPERTY BOUNDARY
- (ORIN, 2012)

0 300 600
Feet

**MONITORING WELL AND BORING LOCATIONS
MARCH 2021**

DYNEGY MIDWEST GENERATION
VERMILION SITE
OAKWOOD, ILLINOIS

FIGURE 1

DRAFT


RAMBOLL US CORPORATION
A RAMBOLL COMPANY



Facility/Project Name Vermilion Power Station		License/Permit/Monitoring Number		Boring Number 101D	
Boring Drilled By: Name of crew chief (first, last) and Firm Jason Greer Cascade Drilling		Date Drilling Started 3/5/2021		Date Drilling Completed 3/5/2021	
Common Well Name 101D		Final Static Water Level Feet (NAVD88)		Surface Elevation 704.09 Feet (NAVD88)	
				Borehole Diameter 6.0 inches	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		State Plane 1,279,698.18 N, 1,146,097.60 E <input checked="" type="checkbox"/> W		Local Grid Location	
1/4 of 1/4 of Section , T N, R		Lat _____ ' _____ "		<input type="checkbox"/> N <input type="checkbox"/> E	
		Long _____ ' _____ "		Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W	
Facility ID		County Vermilion		State Illinois	
				Civil Town/City/ or Village Oakwood	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments	
									Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200		
1 CS	60 43		1.5	0 - 10.3' SILTY CLAY: CL/ML, brown (10YR 5/3), gray (10YR 5/1) mottling (5-10%), sand (0-10%), gravel (0-5%), firm to very stiff, no dilatancy, low to medium toughness, medium to low plasticity, moist.					0.75						CS= Core Sample
			3.0					2.5							
2 CS	60 48		6.0		CL/ML				2.5						
			7.5						2.75						
			9.0						2.5						
3 CS	120 120		10.5	10.3 - 49.5' LEAN CLAY: CL, gray (10YR 5/1), brown (7.5YR 5/3) mottling (0-5%), silt (15-25%), sand (0-5%), gravel (0-5%), stiff, no dilatancy, low toughness, medium plasticity, moist.					1.5						
			12.0						2.25						
			13.5						2.25						
			15.0		CL				1.75						
			16.5						2.25						
			18.0						2.25						
			19.5						1.75						

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

Signature 	Firm Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608
--------------------------------------------------------------------------------------------------	-------------------------------------------------------------------	--------------------------------------------

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			54.0	50 - 58' LEAN CLAY: CL, gray (10YR 5/1), silt (15-25%), sand (0-5%), gravel (0-5%), stiff, no dilatancy, low toughness, medium plasticity, moist. <i>(continued)</i>	CL				2.25					
			55.5						1.75					
			57.0					2						
			58.5	58 - 77.6' SILTY CLAY: CL/ML, dark gray (10YR 4/1) to gray (10YR 5/1), sand (0-5%), gravel (0-5%), stiff to hard, no dilatancy, medium to high toughness, medium plasticity, dry to moist.	CL/ML				2.25					
9 SH	24 18	60.0	2.25											
			61.5											
10 CS	96 96		63.0					4.5						
			64.5											
			66.0					4.25						
			67.5											
			69.0											
11 CS	120 120		70.5					3.25						
			72.0					3.25						
			73.5	72.6' reddish brown (5YR 5/3) mottling (5-10%).				2.75						
			75.0					4.25						
			76.5											
			78.0	77.6 - 78.3' POORLY-GRADED SAND: SP, gray (10YR 5/1), rounded to subrounded, medium sand, silt (5-10%), clay (5-10%), loose, moist.	SP			4.25						
			79.5	78.3 - 78.6' CLAYEY SILT ML/CL, gray (10YR 5/1), hard, no dilatancy, medium toughness, non-plastic, moist.	ML/CL			4.5						
12 CS	120 120		81.0	78.6 - 144.2' SILTY CLAY: CL/ML, dark gray (10YR 4/1) to gray (10YR 5/1), sand (0-5%), gravel (0-5%), hard, no dilatancy, medium to high toughness, medium plasticity, dry.	CL/ML			4.5						
			82.5					4.5						
			84.0											
			85.5	85.9' layer of cobbles.				4.5						

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
									Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
17 CS	120 120		121.5	78.6 - 144.2' SILTY CLAY: CL/ML, dark gray (10YR 4/1) to gray (10YR 5/1), sand (0-5%), gravel (0-5%), hard, no dilatancy, medium to high toughness, medium plasticity, dry. <i>(continued)</i>					4.5					
			123.0						4.5					
			124.5						4.5					
			126.0						4.5					
			127.5						4.5					
18 MC	24 24		130.5	126.2' olive (5Y 5/3) mottling.										
			132.0	127.4' - 127.8' sand with silt, rounded to subrounded, medium to coarse sand, moist to wet.										
19 CS	96 96		132.0	132' stiff, moist.	CL/ML				1.5					
			133.5						1.5					
			135.0						1.75					
			136.5						1.5					
			138.0						1.25					
20 CS	120 120		141.0	144.2 - 146.8' POORLY-GRADED SAND WITH SILT: SP-SM, gray (10YR 5/1), rounded to subrounded, fine to medium sand, loose, wet.	SP-SM				1.5					
			142.5						1.5					
			144.0						1.25					
			145.5						1.5					
			147.0						1.5					
21 CS	120 120		147.0	146.8 - 147.3' SILTY CLAY: CL/ML, gray (10YR 5/1), sand (0-5%), gravel (0-5%), stiff, slow dilatancy, low toughness, medium plasticity, moist.	CL/ML				1.5					
			148.5	147.3 - 148.1' POORLY-GRADED SAND WITH SILT: SP-SM, gray (10YR 5/1), rounded to subrounded, fine to medium sand, loose, wet.	SP-SM				1.5					
			150.0	148.1 - 148.9' SILTY CLAY: CL/ML, gray (10YR 5/1), sand (0-5%), gravel (0-5%), stiff, slow dilatancy, low toughness, medium plasticity, moist.	CL/ML				1.5					
			151.5	148.9 - 149.5' POORLY-GRADED SAND WITH SILT: SP-SM, gray (10YR 5/1), rounded to subrounded, fine to medium sand, loose, wet.	SP-SM				2.25					
			153.0	148.9 - 149.5' POORLY-GRADED SAND WITH SILT: SP-SM, gray (10YR 5/1), rounded to subrounded, fine to medium sand, loose, wet.	CL/ML				2.25					





Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			154.5 156.0 157.5 159.0	149.5 - 160' SILTY CLAY: CL/ML, gray (10YR 5/1), sand (0-5%), gravel (0-5%), no to slow dilatancy, low toughness, medium plasticity, moist. <i>(continued)</i> 154' stiff to very stiff.	CL/ML				2.5					
				160' End of Boring.					3.25					
									3.25					
									4.25					

Facility/Project Name Vermilion Power Station		License/Permit/Monitoring Number		Boring Number 101S	
Boring Drilled By: Name of crew chief (first, last) and Firm Dave Gordon Cascade Drilling		Date Drilling Started 3/16/2021		Date Drilling Completed 3/16/2021	
Common Well Name 101S		Final Static Water Level Feet (NAVD88)		Surface Elevation 704.14 Feet (NAVD88)	
				Borehole Diameter 6.0 inches	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		State Plane 1,279,705.42 N, 1,146,097.45 E <input checked="" type="checkbox"/> W		Local Grid Location	
1/4 of 1/4 of Section , T N, R		Lat _____ ' _____ "		<input type="checkbox"/> N <input type="checkbox"/> E	
		Long _____ ' _____ "		Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W	
Facility ID		County Vermilion		State Illinois	
				Civil Town/City/ or Village Oakwood	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
									Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			0 - 10.3'	SILTY CLAY: CL/ML , Blind drilled to 88 feet below ground surface (ft bgs). See boring log 101D for detailed lithology..	CL/ML									
			10.3 - 49.5'	LEAN CLAY: CL	CL									

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

Signature 	Firm Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608
---------------	-------------------------------------------------------------------	--------------------------------------------

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52	10.3 - 49.5' LEAN CLAY: CL. <i>(continued)</i>	CL									
				49.5 - 50' SILTY CLAY: CL/ML.	CL/ML									
				50 - 58' LEAN CLAY: CL.	CL									

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			72.6	58 - 77.6' SILTY CLAY: CL/ML. <i>(continued)</i>	CL/ML									
			78	77.6 - 78.3' POORLY-GRADED SAND: SP.	SP									
			79	78.3 - 78.6' CLAYEY SILT ML/CL.	ML/CL									
			79	78.6 - 88' SILTY CLAY: CL/ML.	CL/ML									
			88	88' End of Boring.										

Facility/Project Name Vermilion Power Station		License/Permit/Monitoring Number		Boring Number 102D	
Boring Drilled By: Name of crew chief (first, last) and Firm Dave Gordon Cascade Drilling		Date Drilling Started 3/6/2021		Date Drilling Completed 3/7/2021	
Common Well Name 102D		Final Static Water Level Feet (NAVD88)		Surface Elevation 702.98 Feet (NAVD88)	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		State Plane 1,279,245.48 N, 1,147,170.85 E <input checked="" type="checkbox"/> W		Local Grid Location	
1/4 of 1/4 of Section , T N, R		Lat _____ ' _____ "		Feet <input type="checkbox"/> N <input type="checkbox"/> E	
		Long _____ ' _____ "		Feet <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County Vermilion		State Illinois	
				Civil Town/City/ or Village Oakwood	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments			
									Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200				
1 CS	120 120		1	0 - 2.3' WELL-GRADED GRAVEL WITH SAND: (GW)s, very pale brown (10YR 7/4), subrounded, fine to coarse sand, moist.	(GW)s											CS= Core Sample	
			2														
			3														
2 CS	240 240		4	2.3 - 6.6' LEAN CLAY: CL, grayish brown (10YR 5/2), brownish yellow (10YR 6/6) mottling (0-5%), silt (15-25%), gravel (5-15%), low plasticity, hard, dry.	CL												
			5														
			6														
			7														
2 CS	240 240		8	6.6 - 10' LEAN CLAY: CL, dark gray (10YR 4/1), silt (15-25%), gravel (0-5%), stiff, low plasticity, moist.	CL												
			9														
			10														
			11														
			12														
2 CS	240 240		13	10 - 18.7' LEAN CLAY: CL, grayish brown (10YR 5/2), silt (5-15%), gravel (0-5%), medium plasticity, very stiff, moist.	CL												
			14														
			15														
			16														

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



Signature <i>SA Wb</i>	Firm Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608
------------------------	-------------------------------------------------------------------	--------------------------------------------







Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			17	10 - 18.7' LEAN CLAY: CL, grayish brown (10YR 5/2), silt (5-15%), gravel (0-5%), medium plasticity, very stiff, moist. <i>(continued)</i>	CL				2.5					
			18						2					
			19	18.7 - 30' LEAN CLAY: CL, gray (10YR 5/1), silt (5-15%), gravel (0-5%), medium plasticity, very stiff, moist.					2.5					
			20						2					
			21						2					
			22											
			23						2.5					
			24		CL				2.5					
			25						2.5					
			26						2.5					
			27						2.5					
			28						2.5					
			29						2.5					
3	24		30	30 - 32' LEAN CLAY: CL.	CL									SH= Shelby Tube
SH	24		31											
4	216		32	32 - 60' LEAN CLAY: CL, gray (10YR 5/1), silt (5-15%), gravel (0-5%), medium plasticity, very stiff, moist. 32.5' - 33.8' sand (5-10%).					2.5					
CS	216		33						2.5					
			34											
			35						2					
			36											
			37						2.5					
			38		CL				2.5					
			39						2					
			40											
			41						2					
			42						2					

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
5 CS	120 120		43	32 - 60' LEAN CLAY: CL, gray (10YR 5/1), silt (5-15%), gravel (0-5%), medium plasticity, very stiff, moist. <i>(continued)</i>	CL				2.5					
		44												
		45	2											
		46												
		47	2.5											
		48												
		49	2.5											
		50												
		51	2.5											
		52												
6 SH	24 24		60	60 - 62' LEAN CLAY: CL.	CL				2.5					
		61												
		62												
		63	4.5											
		64												
		65	4.5											
		66												
		67	4.5											
7 CS	96 96		62	62 - 70' LEAN CLAY: CL, dark gray (10YR 4/1), silt (5-15%), gravel (0-5%), medium plasticity, hard.	CL				4.5					
		69												

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200		
8 CS	240 240		70						4.5						
			71	70 - 71.4' POORLY-GRADED SAND: SP, dark gray (10YR 4/1), fine to medium sand, silt (0-5%), clay (0-5%), moist to wet.	SP										
			72	71.4 - 81.4' LEAN CLAY: CL, dark gray (10YR 4/1), silt (15-25%), gravel (0-5%), sand (0-5%), medium plasticity, very stiff, moist.						3					
			73												
			74												
			75							2.75					
			76												
			77			CL				2.5					
			78												
			79							3					
			80												
	81														
	82		81.4 - 85.3' CLAYEY SILT ML/CL, gray (10YR 5/1), sand (0-5%), moist to wet.												
	83														
	84		84.1' clay content decreasing with depth.	ML/CL											
	85														
	86		85.3 - 87.5' SILT: ML, gray (10YR 5/1), sand (5-15%), moist to wet.	ML											
	87														
	88		87.5 - 88.6' SILTY CLAY: CL/ML, dark gray (10YR 4/1), low plasticity, hard.	CL/ML											
	89		88.6 - 90' SANDY LEAN CLAY WITH GRAVEL: s(CL)g, dark gray (10YR 4/1), silt(30-45%), low plasticity, hard.	s(CL)g					4.5						
	90		90 - 93' POORLY-GRADED SAND WITH SILT: SP-SM, fine to medium sand, gravel (0-5%), wet.												
	91			SP-SM											
	92														
	93		93 - 130' LEAN CLAY: to SILTY CLAY: CL, dark gray (10YR 4/1), fine to coarse gravel (0-5%), low plasticity, hard.												
	94														
	95			CL					4.5						
	96														

MC=
Modified
California

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
12 CS	360 360		97	93 - 130' LEAN CLAY : to SILTY CLAY : CL, dark gray (10YR 4/1), fine to coarse gravel (0-5%), low plasticity, hard. <i>(continued)</i>	CL									
		98	4.5											
		99	4.5											
		100	4.5											
		101	4.5											
		102	4.5											
		103	4.5											
		104	4.5											
		105	4.5											
		106	4.5											
		107	4.5											
		108	4.5											
		109	4.5											
		110	4.5											
		111	4.5											
112	4.5													
113	4.5													
114	4.5													
115	4.5													
116	4.5													
117	4.5													
118	4.5													
119	4.5													
120	4.5													
121	4.5													
122	4.5													

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			123	93 - 130' LEAN CLAY: to SILTY CLAY: CL, dark gray (10YR 4/1), fine to coarse gravel (0-5%), low plasticity, hard. <i>(continued)</i>					4.5					
			124						4.5					
			125						4.5					
			126		CL				4.5					
			127						4.5					
			128	128.1' -128.4' layer of fine sand.					4.5					
			129						4.5					
			130	130 - 130.7' g(CL), gravelly clay.	g(CL)				4.5					
			131	130.7 - 149.4' LEAN CLAY: to SILTY CLAY: CL, dark gray (10YR 4/1), fine to coarse gravel (0-5%), low plasticity, hard.					4.5					
			132						4.5					
			133						4.5					
			134						4.5					
			135						4.5					
			136						4.5					
			137						4.5					
			138						4.5					
			139						4.5					
			140		CL				4.5					
			141						4.5					
			142						4.5					
			143						4.5					
			144						4.5					
			145						4.5					
			146						4.5					
			147						4.5					
			148						4.5					
			149						4.5					

Facility/Project Name Vermilion Power Station		License/Permit/Monitoring Number		Boring Number 102S	
Boring Drilled By: Name of crew chief (first, last) and Firm Dave Gordon Cascade Drilling		Date Drilling Started 3/16/2021		Date Drilling Completed 3/16/2021	
Common Well Name 102S		Final Static Water Level Feet (NAVD88)		Surface Elevation 702.92 Feet (NAVD88)	
				Borehole Diameter 6.0 inches	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		State Plane 1,279,239.28 N, 1,147,169.25 E <input checked="" type="checkbox"/> W		Local Grid Location	
1/4 of 1/4 of Section , T N, R		Lat _____ ' _____ "		<input type="checkbox"/> N <input type="checkbox"/> E	
		Long _____ ' _____ "		Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W	
Facility ID		County Vermilion		State Illinois	
				Civil Town/City/ or Village Oakwood	

Sample		Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)							Blow Counts	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	
		0 - 1	0 - 2.3' WELL-GRADED GRAVEL WITH SAND: (GW)s, Blind drilled to 90 feet below ground surface (ft bgs). See boring log 102D for detailed lithology..	(GW)s									
		1 - 2.3	2.3 - 6.6' LEAN CLAY: CL.	CL									
		2.3 - 6.6	6.6 - 10' LEAN CLAY: CL.	CL									
		6.6 - 10	10 - 18.7' LEAN CLAY: CL.	CL									
		10 - 18.7											

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

Signature <i>SA Wb</i>	Firm Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608
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Boring Number 102S

Page 2 of 5

Sample			Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)	Blow Counts							Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			10 - 18.7'	LEAN CLAY: CL. <i>(continued)</i>	CL									
			18.7 - 30'	LEAN CLAY: CL.	CL									
			30 - 32'	LEAN CLAY: CL.	CL									

Facility/Project Name Vermilion Power Station		License/Permit/Monitoring Number		Boring Number 103D	
Boring Drilled By: Name of crew chief (first, last) and Firm Jason Greer Cascade Drilling		Date Drilling Started 3/7/2021		Date Drilling Completed 3/9/2021	
Common Well Name 103D		Final Static Water Level Feet (NAVD88)		Surface Elevation 717.38 Feet (NAVD88)	
				Borehole Diameter 6.0 inches	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		State Plane 1,279,960.01 N, 1,147,526.10 E <input checked="" type="checkbox"/> W		Local Grid Location	
1/4 of 1/4 of Section , T N, R		Lat _____ ' _____ "		Feet <input type="checkbox"/> N <input type="checkbox"/> E	
		Long _____ ' _____ "		Feet <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County Vermilion		State Illinois	
				Civil Town/City/ or Village Oakwood	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
									Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 CS	60 44		1.5	0 - 1.2' TOPSOIL: ML/CL, dark brown (10YR 3/3), sand (0-5%), gravel (0-5%), roots (0-5%), firm, slow dilatancy, low toughness, low plasticity, moist.	ML/CL	↓			1.5					CS= Core Sample
			3.0	1.2 - 15' SILTY CLAY: CL/ML, yellowish brown (10YR 5/4), gray (10YR5/1) mottling (5-10%), sand (0-10%), gravel (0-5%), very stiff, no dilatancy, low to medium toughness, medium plasticity, moist.					2.5					
2 CS	60 60		6.0	6' yellowish brown (10YR 5/6) mottling (0-5%).					2.75					
			7.5		CL/ML			3						
3 CS	60 60		10.5						3					
			12.0					2.75						
4 SH	24 18		15.0	15 - 17' LEAN CLAY: CL, grayish brown (10YR /2), sand (5-15%), silt (25-30%), high plasticity, moist.	CL				3.25	16.6	30	15	85.3	SH= Shelby Tube
			16.5					3.25						
5 CS	96 96		18.0	17 - 20' SILTY CLAY: CL/ML, yellowish brown (10YR 5/4), gray (10YR5/1) mottling (5-10%), sand (0-10%), gravel (0-5%), very stiff, no dilatancy, low to medium toughness, medium plasticity, moist.	CL/ML				2.5					
			19.5											

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


Signature 	Firm Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608
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Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			87.0	73.3 - 92.3' LEAN CLAY: to SILTY CLAY: CL, gray (10YR 5/1), sand (0-5%), gravel (0-5%), very stiff, no dilatancy, medium toughness, dry to moist. <i>(continued)</i>					2.25					
			88.5											
18 SH	12		90.0		CL									
19 CS	48		91.5											
			93.0	92.3 - 95.5' POORLY-GRADED SAND: SP, grayish brown (10YR 5/2), rounded to subrounded, fine sand, silt (5-10%), loose, wet.										
			94.5						SP					
20 MC	24	24	96.0	95.5 - 96' SILTY CLAY: CL/ML, grayish brown (10YR 5/2) to gray (10YR 5/1), olive (5Y 5/3) mottling (5-10%), sand (0-10%), gravel (0-5%), stiff to very stiff, no dilatancy, low to medium toughness, medium plasticity, dry to moist.					13.9	17	7	51.8	MC= Modified California	
21 CS	36	36	97.5						CL/ML					
			99.0	96 - 130.5' SILTY CLAY: CL/ML, grayish brown (10YR 5/2) to gray (10YR 5/1), olive (5Y 5/3) mottling (5-10%), sand (0-10%), gravel (0-5%), stiff to very stiff, no dilatancy, low to medium toughness, medium plasticity, dry to moist.					4.25					
22 MC	24	24	100.5											
23 CS	96	96	102.0											
			103.5						2.5					
			105.0						4.5					
			106.5						4.5					
			108.0		CL/ML				4.5					
			109.5						4.5					
24 CS	240	240	111.0						4.25					
			112.5						4					
			114.0						4.5					
			115.5						4.5					
			117.0						4.5					
			118.5						4.5					
			120.0						4.5					

Facility/Project Name Vermilion Power Station		License/Permit/Monitoring Number		Boring Number 103S	
Boring Drilled By: Name of crew chief (first, last) and Firm Jason Greer Cascade Drilling		Date Drilling Started 3/15/2021		Date Drilling Completed 3/15/2021	
Common Well Name 103S		Final Static Water Level Feet (NAVD88)		Surface Elevation 717.62 Feet (NAVD88)	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		State Plane 1,279,964.21 N, 1,147,511.40 E <input checked="" type="checkbox"/> W		Local Grid Location	
1/4 of 1/4 of Section , T N, R		Lat _____ ' _____ "		Feet <input type="checkbox"/> N <input type="checkbox"/> E	
		Long _____ ' _____ "		Feet <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County Vermilion		State Illinois	
				Civil Town/City/ or Village Oakwood	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments	
									Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			0 - 1.2'	TOPSOIL: ML/CL, Blind drilled to 80 feet below ground surface. See 103D boring log for detailed lithology..	ML/CL	↓									No sand observed during drilling
			1.2 - 15'	SILTY CLAY: CL/ML.	CL/ML										
			15 - 17'	LEAN CLAY: CL.	CL										
			17 - 20'	SILTY CLAY: CL/ML.	CL/ML										

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

Signature 	Firm Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608
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Facility/Project Name Vermilion Power Station		License/Permit/Monitoring Number		Boring Number 104D	
Boring Drilled By: Name of crew chief (first, last) and Firm Dave Gordon Cascade Drilling		Date Drilling Started 3/8/2021		Date Drilling Completed 3/8/2021	
Common Well Name 104D		Final Static Water Level Feet (NAVD88)		Surface Elevation 703.24 Feet (NAVD88)	
				Borehole Diameter 6.0 inches	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		State Plane 1,279,172.79 N, 1,147,573.87 E <input checked="" type="checkbox"/> W		Local Grid Location	
1/4 of 1/4 of Section , T N, R		Lat _____ ' _____ "		<input type="checkbox"/> N <input type="checkbox"/> E	
		Long _____ ' _____ "		Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W	
Facility ID		County Vermilion		State Illinois	
				Civil Town/City/ or Village Oakwood	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
									Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 CS	120		0 - 0.8'	SANDY LEAN CLAY: s(CL), very dark brown (10YR 3/2), very fine to coarse sand, gravel (0-5%), low to medium plasticity, stiff, moist.	s(CL)				1.5					CS= Core Sample
	120		0.8 - 20'	LEAN CLAY: CL, grayish brown (10YR 5/2), silt (15-25%), gravel (5-10%), medium plasticity, very stiff to hard, moist.	CL				3.5					
2 CS	120		10'	10' gray (10YR 5/1).					3					
	120								4.5					
									4					
									3.5					
									2					

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









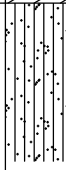

Signature 	Firm Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608
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Boring Number **104D**

Page **2** of **9**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
3 CS	120 120		13	0.8 - 20' LEAN CLAY : CL, grayish brown (10YR 5/2), silt (15-25%), gravel (5-10%), medium plasticity, very stiff to hard, moist. <i>(continued)</i>	CL				2					
		2												
		2.5												
		2												
		2.5												
		2												
			20	20 - 21' CLAYEY GRAVEL : GC, moist to wet.	GC				2					
			21	21 - 25.4' LEAN CLAY : CL, grayish brown (10YR 5/2), silt (15-25%), fine to coarse gravel (5-10%), medium plasticity, very stiff to hard, moist.	CL				2.5					
			25	25.4 - 27.5' CLAYEY SILT ML/CL , grayish brown (10YR 5/2), low plasticity, moist.	ML/CL				2.5					
			27	27.5 - 30' SILT : ML, gray (10YR 5/1), sand (0-5%), clay (0-5%).	ML									
			30	30 - 32' LEAN CLAY : CL.	CL									
4 SH	24 24		31		CL									
			32											



SH= Shelby Tube

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments				
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200					
			53	40 - 60' LEAN CLAY: to SILTY CLAY: CL, gray (10YR 5/1) to dark gray (10YR 4/1), gravel (5-10%), low plasticity, hard. <i>(continued)</i>	CL				4.5									
			54															
			55															
			56															
			57															
			58															
			59						4.5									
7	24	24	60	60 - 62' LEAN CLAY: to SILTY CLAY: CL.	CL													
MC	24	24	61		CL													
8	96	96	62	62 - 70' LEAN CLAY: to SILTY CLAY: CL, gray (10YR 5/1) to dark gray (10YR 4/1), gravel (5-10%), low plasticity, hard.	CL				4.5									
CS	96	96	63															
			64															
			65															
			66															
			67						4.5									
			68															
			69															
			70	70 - 75.6' SANDY SILT: s(ML), dark gray (10YR 4/1), fine sand, clay (5-10%), wet, fine sand seams (0-5%).	s(ML)				4.5									
9	120	120	71															
CS	120	120	72															

MC= Modified California

Boring Number **104D**

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Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
14 CS	240 240		113	92 - 148.1' LEAN CLAY: to SILTY CLAY: CL, dark gray (10YR 4/1), low plasticity, hard, dry. <i>(continued)</i>	CL									
			114						4.5					
			115						4.5					
			116											
			117						4.5					
			118											
			119						4.5					
			120											
			121						4.5					
			122											
			123						4.5					
			124											
			125						4.5					
	126													
	127	4.5												
	128													
	129	4.5												
	130													
	131	4.5												
	132													

Facility/Project Name Vermilion Power Station		License/Permit/Monitoring Number		Boring Number 104S	
Boring Drilled By: Name of crew chief (first, last) and Firm Dave Gordon Cascade Drilling		Date Drilling Started 3/15/2021		Date Drilling Completed 3/15/2021	
Common Well Name 104S		Final Static Water Level Feet (NAVD88)		Surface Elevation 703.10 Feet (NAVD88)	
				Borehole Diameter 6.0 inches	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		State Plane 1,279,172.50 N, 1,147,579.42 E <input checked="" type="checkbox"/> W		Local Grid Location	
1/4 of 1/4 of Section , T N, R		Lat _____ ' _____ "		Feet <input type="checkbox"/> N <input type="checkbox"/> E	
		Long _____ ' _____ "		Feet <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County Vermilion		State Illinois	
				Civil Town/City/ or Village Oakwood	







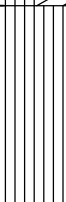


Sample		Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)							Blow Counts	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	
		0 - 1	0 - 0.8' SANDY LEAN CLAY: s(CL) , Blind drilled to 70 feet below ground surface. See 104D boring log for detailed lithology..	s(CL)									
		1 - 12	0.8 - 20' LEAN CLAY: CL	CL									

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

Signature 	Firm Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608
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Boring Number **104S**

Page **2** of **5**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments								
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200									
			13	0.8 - 20' LEAN CLAY: CL. <i>(continued)</i>	CL																	
			14																			
			15																			
			16																			
			17																			
			18																			
			19																			
			20											20 - 21' CLAYEY GRAVEL: GC.	GC							
			21											21 - 25.4' LEAN CLAY: CL.	CL							
			22																			
			23																			
			24																			
			25																			
			26											25.4 - 27.5' CLAYEY SILT ML/CL.	ML/CL							
			27											27.5 - 30' SILT: ML.	ML							
			28																			
			29																			
			30	30 - 32' LEAN CLAY: CL.	CL																	
			31																			
			32																			

Boring Number **104S**

Page **4** of **5**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			53	40 - 60' LEAN CLAY: to SILTY CLAY: CL. <i>(continued)</i>	CL									
			54											
			55											
			56											
			57											
			58											
			59											
			60	60 - 62' LEAN CLAY: to SILTY CLAY: CL.	CL									
			61											
			62	62 - 70' LEAN CLAY: to SILTY CLAY: CL.	CL									
			63											
			64											
			65											
			66											
			67											
			68											
			69											
			70	70 - 74' LEAN CLAY: CL.	CL									
			71											
			72											

Facility/Project Name Vermilion Power Station		License/Permit/Monitoring Number		Boring Number 105D	
Boring Drilled By: Name of crew chief (first, last) and Firm Jason Greer Cascade Drilling		Date Drilling Started 3/5/2021		Date Drilling Completed 3/6/2021	
Common Well Name 105D		Final Static Water Level Feet (NAVD88)		Surface Elevation 698.46 Feet (NAVD88)	
				Borehole Diameter 6.0 inches	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		Local Grid Location			
State Plane 1,279,498.42 N, 1,148,535.89 E <input checked="" type="checkbox"/> W <input type="checkbox"/> E		Lat <input type="text"/> ° <input type="text"/> ' <input type="text"/> "		Feet <input type="checkbox"/> N <input type="checkbox"/> S	
1/4 of <input type="text"/> 1/4 of Section <input type="text"/> , <input type="text"/> T <input type="text"/> N, R <input type="text"/>		Long <input type="text"/> ° <input type="text"/> ' <input type="text"/> "		Feet <input type="checkbox"/> E <input type="checkbox"/> W	
Facility ID		County Vermilion		State Illinois	
				Civil Town/City/ or Village Oakwood	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments	
									Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200		
1 CS	60 / 36		0 - 0.4'	ASH.	(FILL) ASH										Drilled 7" override casing to 15' below ground surface (bgs)
2 CS	60 / 48		0.4 - 5'	FILL, GRAVELLY SILT: g(ML), brown (10YR 4/3), angular, gravel, clay (10-30%), non-plastic, moist.	(FILL) g(ML)										CS= Core Sample
			5 - 9.5'	FILL, GRAVELLY SILT: g(ML), very dark gray (10YR 3/1), clay (5-15%), sand (5-10%), ash and slag-like material, non-plastic, moist.	(FILL) g(ML)										
			7'	black (10YR 2/1).	(FILL) g(ML)										
3 SH	24 / 24		9.5 - 10'	LEAN CLAY: CL, gray (10YR 5/1), silt (5-15%), very stiff, medium plasticity, moist.	CL										SH= Shelby Tube
			10 - 12.												

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

Signature 	Firm Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608
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Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
4 CS	60 0		12 - 17'	No Recovery.										
5 CS	36 36		17 - 20'	LEAN CLAY: CL, gray (10YR 6/1), gravel (5-10%), firm to stiff, high plasticity, moist.	CL			1						
6 CS	60 60		20 - 30'	LEAN CLAY: CL, pale brown (10YR 6/3), silt (10-20%), hard, low plasticity, moist.				0.5						
7 CS	60 60		24'	dark gray (10YR 4/1).				4.5						
7 CS	60 60		25'	gravel (0-5%).	CL			4.5						
8 MC	24 24		30 - 32'	Advanced Modified California sample.				4.5						

MC=
Modified
California



Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
9 CS	36 36		32	32 - 55.4' LEAN CLAY: CL, dark gray (10YR 4/1), silt (10-20%), gravel (5-15%), hard, low plasticity, moist. 40' very stiff to hard.	CL									
			33											4.5
			34											
10 CS	60 60		35											4.5
			36											4.5
			37											4.5
			38											4
			39											
11 CS	60 60		40											2
			41											4
			42											
			43											4.5
			44											
12 CS	60 60		45	3.5										
			46											
			47	3										
			48											
			49	3										
13 CS	60 60		50											
			51	1										
			52											

Boring Number **105D**

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Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
19 CS	60 60		71 - 75'	SILTY CLAY: CL/ML, gray (10YR 6/1), gravel (5-15%), hard, low plasticity, moist. (continued)	CL/ML				4.5					
			73						4.5					
			74		4.5									
20 CS	60 60		75 - 75.8'	SILT: ML, gray (10YR 6/1), moist.	ML				4.5					
			75						4.5					
21 CS	60 60		75.8 - 90'	LEAN CLAY: CL, gray (10YR 5/1), gravel (5-15%), hard, low plasticity, moist.	CL				4.5					
			76						4.5					
			77						4.5					
			78						4.5					
			79						4.5					
			80						4.5					
22 MC	24 24		90 - 92'						4.5					
			90		4.5									
			91						4.5					
			92						4.5					

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
23 CS	96 96		92 - 124.2'	LEAN CLAY: CL, gray (10YR 5/1), silt (15-25%), sand (0-5%), gravel (0-5%), very stiff to hard, no dilatancy, medium to high toughness, medium plasticity, dry to moist.										
		93	2.5											
		94												
		95	2.5											
		96												
		97	4.5											
		98												
		99	4.5											
		100												
		101	4											
24 CS	240 240		98.6' -99.0	layer of cobbles.	CL									
		102												
		103	4.25											
		104												
		105	4											
		106												
		107	3.75											
		108												
		109	4.25											
		110												
		111	4.5											
		112												

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments			
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200				
			153	138.7 - 160' LEAN CLAY: CL, gray (10YR 5/1), silt (15-25%), sand (0-5%), gravel (0-5%), very stiff to hard, no dilatancy, medium to high toughness, medium plasticity, dry to moist. <i>(continued)</i>	CL				2.5								
			154														
			155														
			156														
			157						2.5								
			158														
			159						2.5								
			160	160' End of Boring.													

Facility/Project Name Vermilion Power Station		License/Permit/Monitoring Number		Boring Number 105S	
Boring Drilled By: Name of crew chief (first, last) and Firm Jason Greer Cascade Drilling		Date Drilling Started 3/16/2021		Date Drilling Completed 3/16/2021	
Common Well Name 105S		Final Static Water Level Feet (NAVD88)		Surface Elevation 698.97 Feet (NAVD88)	
				Borehole Diameter 6.0 inches	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		State Plane 1,279,488.62 N, 1,148,530.35 E <input checked="" type="checkbox"/> W		Local Grid Location	
1/4 of 1/4 of Section , T N, R		Lat _____ ° _____ ' _____ "		<input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County Vermilion		State Illinois	
				Civil Town/City/ or Village Oakwood	










Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments	
									Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			0 - 0.4'	ASH, Blind drilled to 90 feet below ground surface. See 105D boring log for detailed lithology.	(FILL) ASH										No sand observed during drilling
			0.4 - 5'	FILL, GRAVELLY SILT: g(ML).	(FILL) g(ML)										
			5 - 9.5'	FILL, GRAVELLY SILT: g(ML).	(FILL) g(ML)										
			9.5 - 17'	LEAN CLAY: CL.	CL										

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

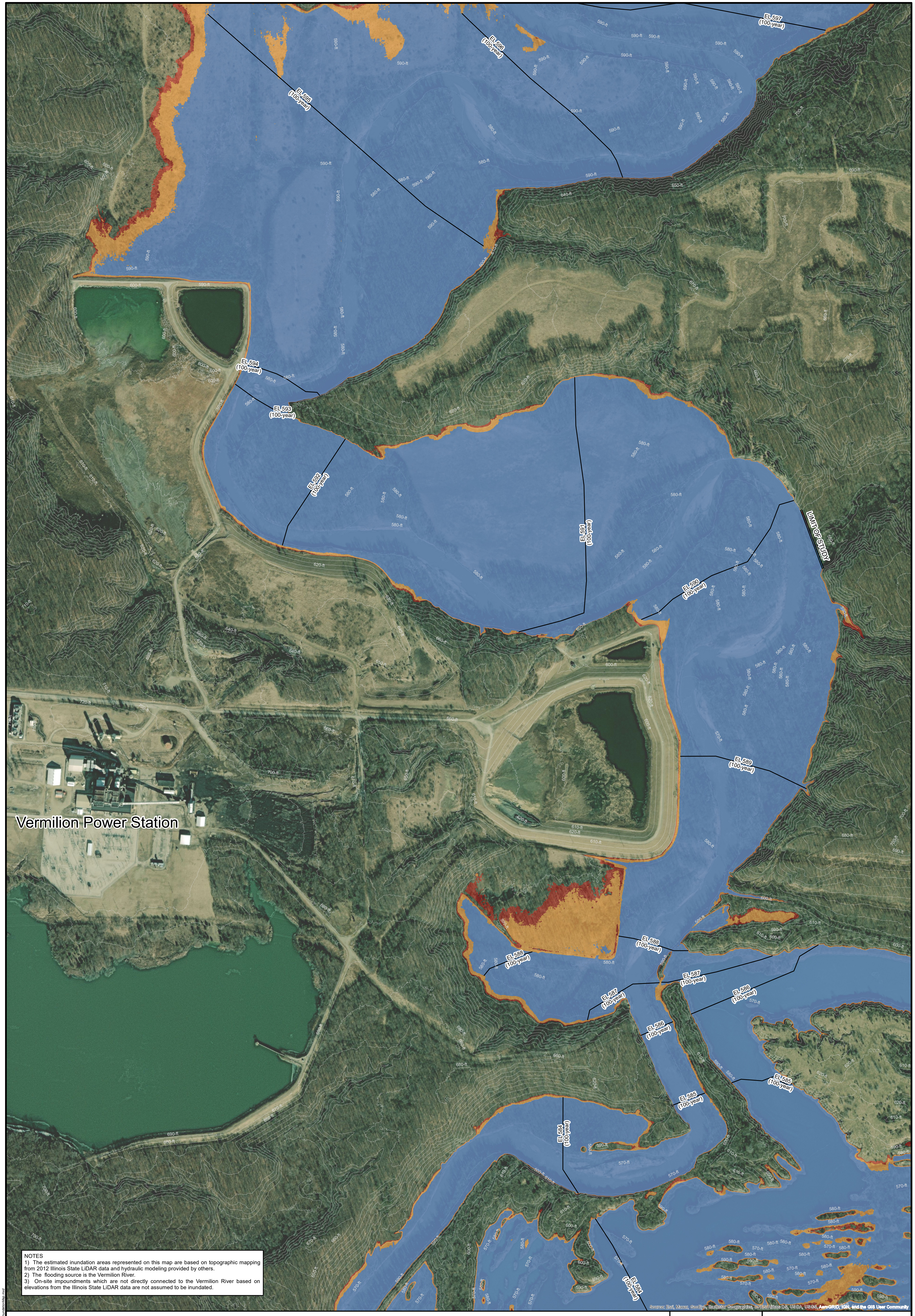
Signature 	Firm Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608
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Boring Number **105S**

Page **2** of **5**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			13	9.5 - 17' LEAN CLAY: CL. <i>(continued)</i>	CL									
		14												
		15												
			17	17 - 20' LEAN CLAY: CL.	CL									
		18												
			20	20 - 32' LEAN CLAY: CL.	CL									
		19												
		20												
		21												
		22												
		23												
		24												
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		30												
		31												
		32												

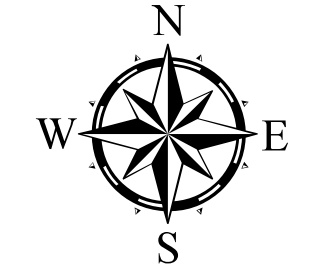
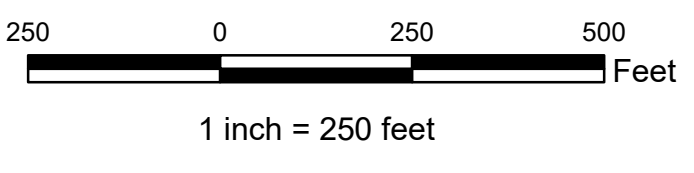
APPENDIX B
INUNDATION MAP



Vermilion Power Station

NOTES
 1) The estimated inundation areas represented on this map are based on topographic mapping from 2012 Illinois State LIDAR data and hydraulic modeling provided by others.
 2) The flooding source is the Vermilion River.
 3) On-site impoundments which are not directly connected to the Vermilion River based on elevations from the Illinois State LIDAR data are not assumed to be inundated.

Legend	
—	100-year Profile Elevations
■ (Yellow)	500-year Inundation Area
■ (Blue)	100-year Inundation Area
■ (Red)	1000-year Inundation Area



DYNEGY
 8/17/2021

Inundation Map	
Vistra Vermilion Power Station Vermilion County, IL	
19E0096C	Sheet 1 of 1