November 18, 2022

AMP TRANSMISSION, LLC

Amherst 2nd Source Reinforcement Project

Letter of Notification Application to the Ohio Power Siting Board
Pursuant to Ohio Administrative Code 4906-6-05

PUCO CASE NUMBER: 22-0956-EL-BLN

AMP TRANSMISSION

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ACRONYMS AND ABBREVIATIONS

A	ampere
ACSS	Aluminum Conductor Steel Supported
AMPT	AMP Transmission, LLC
APE	Area of Potential Effect
ATSI	American Transmission Systems, Inc.
DOW	Division of Wildlife
EMF	electromagnetic field
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
IEEE	Institute of Electrical and Electronics Engineers
kcmil	thousands of circular mils
kV	kilovolt
kV/m	kilovolts per meter
LON	Letter of Notification
mG	milligauss
MVA	megavolt ampere
MW	megawatt
OAC	Ohio Administrative Code
ODNR	Ohio Department of Natural Resources
OEPA	Ohio Environmental Protection Agency
POWER	POWER Engineers, Inc
Project	Amherst 2nd Source Reinforcement ATS
REC	Recognized Environmental Condition
ROW	right-of-way
USFWS	United State Fish and Wildlife Service

Letter of Notification

This Letter of Notification (LON) application is being submitted by AMP Transmission, LLC (AMPT) for the proposed Amherst 2nd Source Reinforcement Project (Project) in the City of Amherst, Ohio. It has been prepared in accordance with Ohio Administrative Code (OAC) 4906-6-05.

4906-6-05(B) General Information

B(1) Project Description

The name of the project and applicant's reference number, names and reference number(s) of resulting circuits, a brief description of the project, and why the project meets the requirements for a letter of notification or construction notice application.

Name of Project: Amherst 2nd Source Reinforcement Project

Project Description: AMPT proposes to tap American Transmission Systems, Inc.'s (ATSI's) existing Beaver-Black River 138 kilovolt (kV) line and construct a new 138 kV double circuit line segment approximately 0.4 mile to the Woodings Substation in Amherst, Lorain County, Ohio (see Figures in Appendix A). After completion of the Project, there will be a Beaver-Woodings 138 kV line and a Black River-Woodings 138 kV line. As part of this Project, AMPT proposes to expand the existing Amherst #2 69/12 kV station to accommodate a new 138 kV yard. The expanded station will be renamed Woodings Substation. At the Woodings Substation 138 kV yard, AMPT proposes to install one 138/69 kV transformer, and three 138 kV circuit breakers arranged in a ring bus configuration.

The Project will construct new steel monopole structures on concrete foundations within a new right-of-way (ROW). The conductor used for the Project will be 954 thousands of circular mils (kcmil) 54/7 aluminum conductor steel supported (ACSS) "Cardinal." Additional operating characteristics for the AMPT Woodings Substation and AMPT-owned structures are described in detail in Section B(9).

This Project meets the requirements of a LON as it is defined in Appendix A of OAC section 4906-1-01.

> *(1) New construction, extension, or relocation of single or multiple circuit electric power transmission line(s), or upgrading existing transmission or distribution line(s) for operation at a higher transmission, as follows:*
>
> > *(a) Line(s) greater than 0.2 miles in length but not greater than two miles in length.*

The Project has been assigned Public Utilities Commission of Ohio Case Number 22-0956-EL-BLN.

B(2) Project Need

If the proposed project is an electric power transmission line or gas pipeline, the applicant shall provide a statement explaining the need for the proposed facility.

The Project is needed to enhance the efficiency, reliability, and operational flexibility for the City of Amherst. The City of Amherst is currently served off a 2.85-mile radial tap of which AMPT owns approximately 1.85 miles. There is also the non-AMPT, ATSI-owned Nordson Station that serves the Nordson industrial facility off the same radial tap.

A permanent or momentary interruption or fault of the Henrietta-Johnson 69 kV line between Nordson and the ATSI Amherst Tap results in the loss of electrical service to all 6,075 customers (approximately 28 megawatts (MW) of load) and ATSI's Nordson Substation until the 69 kV line segment can be restored. There is no ability to transfer load via distribution ties. The vulnerability of city's electrical service was highlighted in the January 11, 2019, PJM Need Meetings for ATSI Projects (Appendix B). ATSI reported that over the past five years the Henrietta-Johnson 69 kV line experienced approximately 21 outages (13 sustained, eight momentary). More recently, on December 1, 2020, a train derailment occurred in Amherst on the Norfolk Southern line adjacent to the Henrietta- Johnson 69 kV line. The 10-car derailment nearly struck a transmission structure on the radial feed; had it been struck, it would have resulted in a sustained outage for all the customers in the City of Amherst.

The proposed Project is required in accordance with AMPT's Transmission Facilities Interconnection Requirements to ensure system reliability under contingency scenarios (https://www.amppartners.org/docs/default-source/ampt/ampt_transmission_facilities__interconnection_requirements.pdf?sfvrsn=2). Per section 2.3, Looped Connection Definition and Requirements, AMPT is required to address or mitigate radial topology configurations with greater than or equal to five megavolt ampere (MVA) of station load or MW-mile transmission line exposure are identified.

The optimal solution to mitigate the loss of the radial supply is to provide a second source to the City of Amherst. AMPT is proposing the installation of a second 138 kV source to supply the Amherst 69 kV transmission system. AMPT will establish a new 138 kV yard (Woodings Substation) at the existing 69/12 kV Amherst #2 Substation and supply the second feed via a new approximately 0.4-mile 138 kV double circuit transmission line. At the Woodings Substation, the new 138 kV source will electrically connect to the existing 69 kV Amherst transmission system via one new 138/69 kV 130 MVA transformer. If applicable N-1 and N-1-1 contingency scenarios occur after completion of the Project, all the City of Amherst customers and the Nordson industrial facility will remain in service.

This Project was presented to PJM at the sub-regional Regional Transmission Expansion Plan Committee – West meetings held on November 19, 2021 and February 18, 2022 to resolve planning criteria violations. The PJM meeting slides are included in Appendix B. The Project is assigned Supplemental ID: S2671.

B(3) Project Location

The applicant shall provide the location of the project in relation to existing or proposed lines and substations shown on an area system map of sufficient scale and size to show existing and proposed transmission facilities in the project area.

Figures 1 and 2 in Appendix A show the location of the proposed Woodings Substation and proposed 138 kV transmission line in relation to existing ATSI Beaver – Black River 138 kV line and the existing Amherst #2 Substation.

B(4) Alternatives Considered

The applicant shall describe the alternatives considered and reasons why the proposed location or route is best suited for the proposed facility. The discussion shall include, but not be limited to, impacts associated with socioeconomic, ecological, construction, or engineering aspects of the project.

Alternatives to the Proposed Project

In addition to the proposed Project, AMPT considered the following alternative:

Rebuild Existing 69kV Line to Double Circuit – AMPT considered rebuilding 2.8 miles of the existing 69 kV transmission line from Cannon to the Amherst Tap to a double circuit configuration (i.e., facilities arranged on common transmission structures). This option was not selected as a tower outage of the new double circuit segment would still interrupt all the load in the area. Thus, a double circuit rebuild would be unable to mitigate the identified planning criteria violation. Additionally, based upon preliminary routing options for the alternative, AMPT determined that the transmission line ROW is limited due to the existing railroad adjacent to the existing 69 kV line.

Alternative Substation Sites

No alternative substation sites were considered because the existing city-owned Amherst #2 Substation parcels could accommodate the proposed Woodings Substation equipment.

Transmission Line Alternatives

Alternative Routes were considered to connect to the existing ATSI-owned Beaver-Black River 138 kV Transmission Line to the proposed Woodings Substation (site of the existing Amherst #2 Substation). The 138 kV transmission line routing process included review of the following criteria:

- Transmission line tie-in length and the number of angles greater than 20 degrees
- Natural and cultural resources
- Environmental site conditions
- Site topography
- Construction and operational noise impacts
- Future development plans and local zoning
- Underground utility conflicts
- Future operation and maintenance safety
- Adequate available land
- Existing structures, residences, and outbuildings
- Parcel boundaries
- Industrial or commercial operations
- Construction feasibility and suitable access
- Public stakeholder input

Four Alternative Routes were considered during the routing process.

- Alternative 1 exits northwest out of the Amherst #2 Substation, parallels the railroad with approximately 30-feet aerial easement from the railroad ROW, proceeding northwest towards the Beaver-Black River Transmission Line.
- Alternative 2 exits the Substation to the south along the existing access road towards the intersection with Milan Avenue. The alternative route then proceeds west along the north side of Milan Avenue, crosses North Quarry Road, then angles northwest across a wooded area toward the Beaver-Black River Transmission Line.
- Alternative 3 proceeds northwest out of the Amherst #2 Substation (similar to Alternative 1) parallels the railroad before crossing the railroad perpendicularly, offset from the existing aerial waterline crossing. The route then proceeds northwest along the north side of the railroad to the Beaver-Black River Transmission Line.
- Alternative 4 parallels the railroad with no aerial easement requirement from the railroad, proceeding northwest to the existing transmission line. The alternative transmission line routes are shown on Figure 3 (Appendix A).

A quantitative and qualitative analysis was completed on the four Alternative Routes based on criteria developed early in the siting process. As shown on Table 1, key metrics were reviewed for the Alternative Routes to determine the least impactful route while meeting the Project's purpose and need.

TABLE 1 ALTERNATIVE ROUTE ANALYSIS

METRIC	ALTERNATIVE 1 (PARALLEL RAILROAD, WITH AERIAL EASEMENT)	ALTERNATIVE 2 (MILAN AVENUE)	ALTERNATIVE 3 (WATERLINE ROUTE)	ALTERNATIVE 4 (PARALLEL RAILROAD, NO AERIAL EASEMENT)
Size				
Length (miles)	0.37	0.61	0.34	0.37
Acres of ROW	4.7	7.5	4.3	4.7
Angles >20 degrees	0	4	2	0
Human Environment				
Barns, outbuildings, sheds, garages, within the 100-foot ROW	3	2	2	3
Residences/multi-family dwellings, or businesses within the 100-foot ROW	0	0	1	0
Residences/single family dwellings within 100 feet of the centerline	0	2	4	1
Number of parcels crossed	6	11	11	6
Landowners within ROW	6	19	14	6

METRIC	ALTERNATIVE 1 (PARALLEL RAILROAD, WITH AERIAL EASEMENT)	ALTERNATIVE 2 (MILAN AVENUE)	ALTERNATIVE 3 (WATERLINE ROUTE)	ALTERNATIVE 4 (PARALLEL RAILROAD, NO AERIAL EASEMENT)
Transportation and Utility Resources				
Existing distribution lines paralleled or underbuilt (miles)	0.11	0.28	0.0	0.11
Local roads paralleled (miles)	0.0	0.14	0.06	0.0
Railroad paralleled (miles)	0.20	0.0	0.25	0.0
Total length paralleled (miles)	0.31	0.28	0.31	0.11
Local roads and streets crossed	0	2	0	0
Railroad crossed	0	0	1	0
Steep slopes (<20%) crossed by ROW (acres)	0.88	0.09	0.64	0.48
Communication towers within 1,000 feet of the centerline	2	2	2	2
Environmental Resources				
Tree clearing required in the ROW (digitized based on aerial photography) (acre)	2.74	4.32	2.43	2.76
Listed archaeological sites within 250 feet of centerline	0	0	0	0

The Alternative Routes would vary in potential impacts on land use and engineering and construction feasibility.

- Alternative 1 has a steep slope within the easement; however, the transmission line would be located at the top of the slope with an aerial easement from the railroad located at the bottom of the slope.
- Alternative 3 includes a residence within the 100-foot ROW; however, with design standards the transmission line would meet required minimum electrical clearances.
- Alternative 4 is offset to the south of Alternative 1 to avoid an aerial easement from the railroad, thus, it has less steep slopes in the ROW than Alternative 1 and it would not require an easement from the railroad. Additionally, Alternative 4 was selected by the siting team as the Proposed Route because:
    - It is a low-cost alternative due to the predominantly straight route and shorter length
    - It parallels an existing disturbed industrial/railroad corridor
    - It is feasible for construction

After selection of the Proposed Route, Alternative 4 was refined and optimized during transmission line design to further minimize impacts on landowners. The transmission line structures were placed to minimize visual impacts on landowners while meeting required electrical clearances. The span length between structures was maximized, where feasible, to reduce the number of structures required for the Project.

Ecological surveys, a Phase I Cultural Resource survey, a Phase I Environmental Site Assessment (ESA), a Pre- and Post-Construction Noise Analyses, Phase II soil sampling, and a rare, threatened and endangered plant species survey were conducted within the areas proposed for potential disturbance during construction or operation of the Project. The results of these studies indicated that Alternative 4 is suitable as the Proposed Route. The results of the various studies are detailed in Section (B)(10) of this application and the reports are included in the appendices.

Summary

Construction of the 138 kV Woodings Substation in Amherst, Ohio is needed to increase the reliability and operational flexibility of the grid and to reduce the potential for a single point outage. The existing Amherst-owned parcels were selected as the Project substation site due to their availability, proximity to the Amherst #2 distribution substation, sufficient size to accommodate additional substation equipment, and their proximity to the Beaver-Black River Transmission Line. Further, the parcels are zoned C2 Commercial General Business, and "electric substation" is a permitted use in the district. Four alternative transmission line routes developed to connect the Woodings Substation to an ATSI structure were compared to minimize impacts on natural resources, cultural resources, and land use. The proposed transmission line route was selected to parallel existing railroad infrastructure, minimize the number of parcels crossed, minimize heavy angles, and required similar (or lesser) amounts of tree clearing as the alternative routes.

This Project will benefit the local economy through direct and indirect employment over the ten-month construction period. The Project has an estimated $8,800,000 budget for construction, not including the budgeted $5,200,000 for the owner's furnished equipment. In addition to direct employment, during construction there will be a local influx of additional dollars associated with lodging, meals, and shopping by construction teams and related site support workers. This construction and associated business will support the local Amherst, Ohio economy. The median Amherst household income is estimated at $76,402, with 6.7% of the population considered in poverty (United States Census Bureau Quick Facts, http://www.census.gov/quickfacts, 2022).

The Project further supports the local economy by proposing to use Ohio-made materials, where feasible, including locally sourced concrete for transmission structure foundations, steel structures fabricated in Washington Courthouse, Ohio, substation surge arresters from Ohio Brass made in Wadsworth, Ohio and Marathon terminal blocks made in Bowling Green, Ohio. Overall, the Project supports the local economy by reinforcing their power supply by adding a second transmission source to the City of Amherst.

B(5) Public Information Program

The applicant shall describe its public information program to inform affected property owners and tenants of the nature of the project and the proposed timeframe for project construction and restoration activities.

AMPT's public information program informed affected property owners and tenants about the Project via several methods and at various stages of the Project. The City of Amherst first expressed an interest to ATSI, the regional transmission owner, in 1989 to request a second feed to the City. The public information program for this Project began on July 22, 2019, when the City of Amherst and AMPT entered into an agreement to provide a second transmission interconnection for the City. This ordinance, A-19-39, was sent to a second reading at the public council meeting that evening on July 22, 2019, and approved in a Special Council Meeting on August 19, 2019 (Appendix C). The local newspaper, the *Morning Journal*, published a description of the City's approval of a power transmission line and a photo from the meeting in the July 24, 2019 newspaper. Later, on January 1, 2020, the *Morning Journal* published a re-cap of the proposed Project, describing the likely Project location and emphasizing the importance of the Project to improve reliability of the electrical transmission supply to the City of Amherst.

In 2021, the landowners along the Proposed Route were notified of the Project when a Project description, Project study area figure, and a survey permission form was mailed to them in early February by Emerald Energy & Exploration Land Company (Emerald), the ROW subcontractor for the Project. Emerald's survey permission form also requested information about features on the landowner's parcels and provided an opportunity for landowners to describe additional features of their property that could influence the surveys or the transmission line route. On March 3, 2021, the Mayor of Amherst held a discussion meeting with the landowners located near the Project and their legal representation so they could understand the route selected by the Project's siting team, understand the Project's need and timeline, and express questions or concerns about the Project.

In compliance with OAC 4906-6-07, upon filing the accelerated application, AMPT will provide a letter with a link to the electronic copy of the application to the chief executive officers in Amherst, Amherst Township, and Lorrain County, and the heads of the public agencies charged with the duty of protecting the environment or planning land use in the area of the proposed substation and transmission line.

Additionally, following the requirements in OAC 4906-6-08, within seven days of filing this LON, AMPT or their agent will give public notice in a newspaper of general circulation in the Project area. Letters will also be sent to the property owners and landowners contiguous to the Project. The letters will describe the Project, include a map of the location and layout, a list of locations where the interested parties can access the application, and how to participate and comment on the Ohio Power Siting Board's proceedings. A letter with a link to the electronic copy of the application will be available in the Amherst Public Library. The Project announcement will be available on AMPT's website (https://www.amppartners.org/about/amp-transmission/projects) and hard copies can also be requested from the website.

Last, following the requirements in OAC 4906-6-11, at least seven days prior to construction, the affected landowners will be notified via mail of the construction schedule, restoration schedule, and the issue resolution process. The notification letter will include contact information for the ROW agent assigned to this Project. The ROW agent will serve as the first contact for landowners.

B(6) Construction Schedule

The applicant shall provide an anticipated construction schedule and proposed in-service date of the project.

The Project is proposed to start construction in March 2023 and is anticipated to be in-service December 2023 with restoration complete in April 2024.

B(7) Aerial Map

The applicant shall provide a map of at least 1:24,000 scale clearly depicting the facility with clearly marked streets, roads, and highways, and an aerial image.

Appendix A includes Figure 1 with the location of the Project on United States Geological Survey quadrangle maps. Figure 2 shows the Project location on aerial background with labeled streets, roads, and highways.

B(8) Property Owners

The applicant shall provide a list of properties for which the applicant has obtained easements, options, and/or land use agreements necessary to construct and operate the facility and a list of the additional properties for which such agreements have not been obtained.

Table 2 below lists the status of the properties where easements or lease agreements will be required for the Project. AMPT anticipates that agreements will be reached with each of the landowners. A copy of the proposed easements for the residential landowners is included in Appendix K.

TABLE 2 PROPERTY OWNER LIST

PARCEL NUMBER	PROPERTY OWNER	EASEMENT STATUS
05-00-003-106-018	City of Amherst	Pending Negotiations
05-00-003-106-020	City of Amherst	Pending Negotiations
05-00-003-106-026	Amherst Aerie No. 1442 Fraternal Order of Eagles	Pending Negotiations
05-00-003-106-030	Christopher Bartish	Pending Negotiations
05-00-098-000-147	Christopher Bartish	Pending Negotiations
05-00-098-000-148	Joel P. & Marcia Miller	Pending Negotiations
05-00-098-000-081	Joel P. & Marcia Miller	Pending Negotiations
05-00-098-000-085	Samuel & Susanne Silva	Pending Negotiations
05-00-098-000-023	Ohio Edison Company	Pending Negotiations

B(9) Technical Features

B(9)(a) Operating characteristics, estimated number and types of structures required, and right-of-way and/or land requirements.

The following equipment and facilities will be installed within the fenced area of the Project:

- (3) 138 kV, 3,000 ampere (A) Circuit Breakers
- (10) 138 kV, 2,000 A Switches
- (2) 50-foot Line Termination Structure
- (4) 25-foot Switch Support Structures
- (5) 17-foot Switch Support Structures
- (2) 25-foot and (4) 17-foot Rigid Bus Support Structures with 4-inch 3,000 A aluminum buswork
- (9) 138 kV Capacitive Voltage Transformers
- (6) 138 kV Surge Arresters
- (1) 138/69/12.47 kV, 78/104/130 MVA Transformer
- (1) 36-foot by 16-foot Control Enclosure
- Substation security lighting for dusk-to-dawn operation to maintain a level of 0.2 footcandles, per the National Electric Safety Code

- Substation Service Lighting for switched (on-demand) operation to maintain a level of 2.0 footcandles per the National Electric Safety Code and will be directed towards the substation equipment.
- The proposed substation grading limit is approximately 2.57 acres which includes a 0.34-acre stormwater pond. The Project proposes to establish a substation with fenced limits of 1.29 acres.

The Project's transmission line component will include the installation of five, approximately 120-foot tall, double-circuit steel monopole structures on concrete foundations. The AMPT transmission line is the Beaver – Woodings 138 kV circuit while the ATSI circuit is called the Beaver – Black Creek 138 kV. The Project will utilize 954 kcmil 54/7 ACSS "Cardinal" conductor and 3/8-inch extra high strength steel shield wire. The line has been designed to function at 138 kV. The transmission line ROW from the demarcation point on Structure 1006 to Woodings Substation is 4.7 acres.

B(9)(b) For electric power transmission lines that are within one hundred feet of an occupied residence or institution, the production of electric and magnetic fields during the operation of the proposed electric power transmission line. The discussion shall include:

POWER completed an electromagnetic fields (EMF) study for the Proposed Project due to one transmission line located within approximately 90 feet of an occupied residence. The transmission line studied consists of two circuits, both utilizing 954 kcmil ACSS 54/7 "Cardinal" conductor, and a 3/8-inch extra high strength steel shield wire. The 138 kV line is proposed to be constructed with steel pole structures for the entirety of the line. Table 3 and the sections below list the anticipated EMF for various load scenarios. In all loading cases, the values fell below the exposure reference levels. The full report is included in Appendix D.

B(9)(b)(i) Calculated electric and magnetic field strength levels at one meter above ground under the lowest conductors and at the edge of the right-of-way for:

B(9)(b)(i)(a) Normal maximum loading.

Maximum Electric Field within the ROW is 2.0 kV/m for the Normal Maximum Loading case and 0.4 kV/m at the edge of right-of-way. Maximum Magnetic Field within the right-of-way is 276 mG for this case and 153 mG at the edge of ROW. These values fall below Institute of Electrical and Electronics Engineers (IEEE) C95.1-2019 exposure reference levels of 5 kV/m and 9,040 mG.

B(9)(b)(i)(b) Emergency line loading.

Maximum Electric Field within the ROW is 2.0 kV/m for the Emergency Line Loading case and 0.4 kV/m at the edge of right-of-way. Maximum Magnetic Field within the right-of-way is 319 mG for this case and 176 mG at the edge of ROW. These values fall below IEEE C95.1-2019 exposure reference levels of 5 kV/m and 9,040 mG.

B(9)(b)(i)(c) Winter normal conductor rating.

Maximum Electric Field within the right-of-way is 2.0 kV/m for the Winter Normal Loading case and 0.4 kV/m at the edge of right-of-way. Maximum Magnetic Field within the right-of-way is 290 mG for this case and 160 mG at the edge of ROW. These values fall below IEEE C95.1-2019 exposure reference levels of 5 kV/m and 9,040 mG.

TABLE 3 ELECTROMAGNETIC FIELD RESULTS

	ELECTRIC FIELD (KV/M)		MAGNETIC FIELD (MG)	
LOAD CASE	**MAXIMUM WITHIN ROW**	**EDGE OF ROW**	**MAXIMUM WITHIN ROW**	**EDGE OF ROW**
NORMAL MAXIMUM [B(9)(B)(I)(A)]	2.0	0.4	276	153
EMERGENCY LINE [B(9)(B)(I)(B)]	2.0	0.4	319	176
WINTER NORMAL [B(9)(B)(I)(C)]	2.0	0.4	290	160

B(9)(b)(ii) A discussion of the applicant's consideration of design alternatives with respect to electric and magnetic fields and their strength levels, including alternate conductor configuration and phasing, tower height, corridor location, and right-of-way width.

The EMF study assumes that the phasing of both circuits is C-B-A from top to bottom of the structure, which produces conservative results relative to cross-phasing the two circuits. Note that with conservative C-B-A phasing, it results in EMF levels throughout the ROW to fall below IEEE Std C95.1-2019 exposure reference levels. Results shown consider a maximum operating voltage of 105% of nominal, or 145 kV, as electric field results are impacted by voltage.

The Project team considered utilizing structures that would hold the wires 100 feet above the ground. This option would require structures approximately 60 feet taller than the current design. These taller structures would receive scrutiny from the Federal Aviation Administration (FAA) due to the hazard posed to air navigation and communication. If approved, the taller structures would require marking and lighting in accordance with FAA Advisory Circular (AC) 70/7460-1L. The taller structures with additional lighting would also have a larger visual impact on the landowner and the surrounding landscape. Last, these structures would be approximately 33% more expensive than the proposed design and thus, due to these factors, were removed from consideration.

POWER also considered Alternative Route 1 which overhung the railroad ROW, as described in section B(4), and would move the wires further from the occupied residences. This option was removed from consideration due to the steep slopes in the railroad ROW which would be difficult for construction and future maintenance, and due to the additional permits and coordination required to secure an easement with the railroad company.

B(9)(c) The estimated capital cost of the project.

The capital cost estimate for the Project is $14,000,000. The costs for this Project will be recovered as part of the FERC-accepted AMPT rate base through the ATSI zone.[1]

[1] AMPT's Formula Rate is Attachment H-32A to the PJM Open Access Transmission Tariff, which was accepted by FERC in 2019. *See PJM Interconnection, L.L.C.* 166 FERC ¶ 61,216 (2019).

B(10) Social and Ecological Impacts

B(10)(a) Provide a brief, general description of land use within the vicinity of the proposed project, including a list of municipalities, townships, and counties affected.

The Project is located in the City of Amherst in Lorain County, Ohio. The Project area is composed of young/second-growth forests, herbaceous uplands, high intensity development (commercial and industrial properties), active railroad, mowed grass, new fields, residential areas, and road/driveway ROW. The mowed grass habitat is located along the north side of North Quarry Road and in areas west and southwest of the existing Amherst #2 Substation. High intensity development, including the KTM North America, Inc. industrial facility, is located in the eastern Project area, between the existing Amherst #2 Substation and Milan Avenue.

The existing Amherst #2 Substation is located on a 1.0-acre parcel located approximately 0.26-mile north of Milan Avenue in the eastern extent of the Project area. The parcel adjacent to the west of the existing substation includes 0.70-acre of land which is proposed for the expansion of the Amherst #2 Substation. These two parcels are owned by the City of Amherst and are zoned as C2 Commercial General Business District. The portion of the Project area south of the City of Amherst-owned parcels is also zoned as C2. This area includes developed land, the Fraternal Order of Eagles club, mowed grass, and young/second growth forest.

West of the developed land, the properties are zoned R1 Single Family Residential and dominated by young/second-growth forest with some residential areas within the forest. South of the Norfolk-Southern Railway the undeveloped land is dominated by herbaceous upland and new-field habitats.

B(10)(b) Provide the acreage and a general description of all agricultural land, and separately all agricultural district land, existing at least sixty days prior to submission of the application within the potential disturbance area of the project.

The Project area does not include land used for agriculture. No Agricultural District Lands were identified in the Project area.

B(10)(c) Provide a description of the applicant's investigation concerning the presence or absence of significant archeological or cultural resources that may be located within the potential disturbance area of the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.

A Phase I Cultural Resources Survey was completed at the Project area on May 11 and 12, 2021. The complete report is included in Appendix E. A file review was undertaken using the Ohio Online Mapping System prior to fieldwork to identify cultural resources recorded within 0.5 mile of the Project. There are four previously recorded historic architectural resources (LOR0012117, LOR0003617, LOR0010517, and LOR0002917) and one cemetery (OGSID 6966) within 0.5 mile of the Project, none of which are recommended as eligible for the National Register of Historic Places nor are they within the Project's area of potential effect (APE). None of the previously recorded resources will be directly or indirectly impacted by the Project.

The APE for historic and prehistoric archaeological resources was limited to the areas of direct ground disturbance from the Project. The archaeological APE encompasses the approximately 16-acre Project area. Approximately 7.4 acres in the western portion of the Project and 1.7-acres on the City of Amherst owned property on the eastern end of the Project were only visually inspected due to prior disturbance caused by quarrying activities, shallow bedrock, underground utility lines, inundation, underdrainages, and a stormwater basin. In addition, an area encompassing 1.0-acre along the southeastern portion of the proposed transmission line ROW was visually inspected due to the presence of a recently constructed residence.

A total of 26 shovel tests were excavated in the remaining 5.38 acres within the eastern and southeastern portions of the Project, in an effort to identify buried archaeological resources. Approximately 20% of the Project area had sufficient (greater than 50%) ground surface visibility to perform a visual survey only. No archaeological sites were identified as a result of the survey.

The architectural APE is defined as the area within both 0.5 mile and in view of the Project. Impacts on resources can either be direct, physical alterations to the resource itself, or indirect, an alteration to the setting of the resource. Four newly documented architectural resources (B-01, B-02, B-03, and B-04) constructed before 1971 were identified within view of the Project. Two of the newly recorded historic architectural resources are not recommended as contributing or eligible for the National Register of Historic Places due to changes or alterations, and/or lack of defined style, and two of the newly recorded architectural resources were not assessed due to lack of access. Due to existing, unrelated transmission lines already a part of the viewshed, none of the resources will be affected by the Project. None of the newly recorded architectural resources will be directly impacted by the Project.

Based on the results of the Phase I Cultural Resources Survey, no potentially significant cultural resources would be affected by the proposed Project. The Ohio History Connection concurred with these findings in a letter dated July 19, 2021, which is included in Appendix E.

B(10)(d) Provide a list of the local, state, and federal governmental agencies known to have requirements that must be met in connection with the construction of the project, and a list of documents that have been or are being filed with those agencies in connection with siting and constructing the project.

Table 4 lists the relevant jurisdiction or agency and the permit type required for construction of the Project.

TABLE 4 FEDERAL, STATE, AND LOCAL PERMITS REQUIRED FOR THE PROJECT

JURISDICTION/AGENCY	PERMIT TYPE
Federal	
United State Army Corps of Engineers	404 Permit- Nationwide Permit 57
State	
Ohio Environmental Protection Agency	Stormwater Pollution Prevention Plan Review and Approval
Local	
City of Amherst	Planning Commission Application
City of Amherst	Right-of-Way Use Agreement
City of Amherst	Non-Residential Plan Application
City of Amherst	Road Crossing Permit
City of Amherst	Stormwater Pollution Prevention Plan Review
Lorain County	Heavy Haul Permit (county roads)

B(10)(e) Provide a description of the applicant's investigation concerning the presence or absence of federal and state designated species (including endangered species, threatened species, rare species, species proposed for listing, species under review for listing, and species of special interest) that may be located within the potential disturbance area of the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.

POWER completed an on-site assessment for wetlands and streams on May 11, 2021. During this on-site assessment, POWER biologists performed a visual assessment of the survey area for any potential protected species, rare or unique habitats, and migratory bird nests such as bald eagles, hawks, and herons.

- No migratory bird nests were observed.
- POWER observed a few trees exhibiting potential summer roost habitat characteristics for Indiana or northern long-eared bats.
- No caves or mine portals were observed within the survey area, and there are no records of any near the site.
- No state- or federally listed species and no unique habitats were observed during the on-site assessment.

Based on the visual assessment, POWER determined that no adverse impacts to migratory bird nests such as bald eagles, hawks, and herons are anticipated as a result of the Project.

POWER received a response from the United States Fish and Wildlife Service (USFWS) on June 10, 2021, indicating that the proposed Project is in the vicinity of the Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*), both federally listed species. The USFWS indicated that summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and breed and may also include adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, woodlots, fallow fields, and pastures. The USFWS recommended that trees be saved wherever possible, and that the removal of any trees three inches or more in diameter at breast height (dbh) only occur between October 1 and March 31. The USFWS also recommended avoiding and minimizing impacts on wetland habitats to the extent possible, to benefit water quality and fish and wildlife habitat. The USFWS stated that due to the project type, size, and location, they do not anticipate adverse effects to any other federally endangered, threatened, or proposed species, or proposed or designated critical habitat. A copy of the agency response is included in Appendix F.

POWER received a response from the Ohio Department of Natural Resources (ODNR) on July 23, 2021, identifying threatened, potentially threatened and endangered species within 1.0-mile of the proposed Project. The ODNR provided information from the Natural Heritage Database, the Division of Wildlife (DOW), the Division of Natural Areas and Preserves, and the Division of Water Resources.

The Division of Natural Areas and Preserves identified two rare plant species within the proposed Project area. These rare plant species include the round-leaved dogwood (*Cornus rugosa*), a state species of concern, and rock harlequin (*Capnoides sempervirens*), a state endangered species. These two species were reported by the Division of Natural Areas and Preserves as having previously been found within the footprint of the proposed Project. A rare plant survey was conducted on October 5, 2021, for these species and other rare, threatened, or endangered plant species. No rare, threatened, or endangered plant species were identified within the Project area. The rare species report is included in Appendix F. The ODNR Division of Natural Areas and Preserves provided their concurrence on November 8, 2021. They concurred with the findings of the report that the Project would not impact state endangered or threatened plant populations. A copy of the ODNR response email is included in Appendix F.

The ODNR Division of Wildlife indicated the proposed Project is within range of the following state endangered or threatened species:

- Indiana bat (*Myotis sodalis*)
- northern long-eared bat (*Myotis septentrionalis*)
- little brown bat (Myotis lucifugus)
- tricolored bat (*Perimyotis subflavus*)
- black sandshell (*Ligumia recta*)
- pondhorn (*Uniomerus tetralasmus*)
- lake sturgeon (*Acipenser fulvescens*)
- Ohio lamprey (*Ichthyomyzon bdellium*) spotted gar (*Lepisostues oculatus*)
- American eel (*Anguilla rostrata*)
- bigmouth shiner (*Notropis dorsalis*)
- channel darter (*Percina copelandi*)
- Blanding's turtle (*Emydoidea blandingii*)
- spotted turtle (*Clemmys guttata)*
- American bittern (*Botaurus lentiginosus*)
- black-crowned night-heron (*Nycticorax nycticorax*)
- lark sparrow (*Chondestes grammacus*)
- least bittern (*Ixobrychus exilis*), northern harrier (*Circus hudsonis*)
- sandhill crane (*Grus canadensis*), trumpeter swan (*Cygnus buccinator*)
- upland sandpiper (*Bartramia longicauda*).

A more detailed analyses of these species is included in Table 3 of the Ecological Survey Report (Appendix F). In summary, no state- or federally listed species and no unique habitats were observed during the on-site assessment with the exception of potential roost tree summer habitat for the identified bat species. Impacts to these species are proposed to be avoided with winter tree clearing. If winter tree clearing is not feasible, then presence/absence surveys may be required. The ODNR response letter is also included in Appendix F of the Ecological Survey Report, provided in Appendix F of this filing.

B(10)(f) Provide a description of the applicant's investigation concerning the presence or absence of areas of ecological concern (including national and state forests and parks, floodplains, wetlands, designated or proposed wilderness areas, national and state wild and scenic rivers, wildlife areas, wildlife refuges, wildlife management areas, and wildlife sanctuaries) that may be located within the potential disturbance area of the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.

POWER completed a site visit on May 11, 2021, to review the Project for areas of ecological concern. The Ecological Survey Report is included in Appendix F. POWER biologists identified three wetlands totaling 0.27 acre within the survey area. One stream was identified, totaling 20 feet within the survey area. One man-made stormwater pond was identified on the eastern portion of the site.

It is POWER's opinion that:

- The stream and three wetland areas are likely to be considered jurisdictional and regulated by the United States Army Corps of Engineers.
- The stormwater detention basin should not be regulated by the United States Army Corps of Engineers or OEPA based on construction plans provided for the basin.
    - The stormwater extended detention basin includes an Ohio Department of Transportation-modified catch basin with flow restrictor orifices to attenuate storm events per OEPA and local jurisdictions.
    - The basin discharges into an underground storm piping system, which conveys runoff east to the existing system and the KTM detention pond.

Pending the final engineering design and access routes, additional coordination and permitting for impacts to jurisdictional waters of the United States may be required.

The Federal Emergency Management Agency's National Flood Hazard Layer was reviewed to determine flood risk in the Project area. The Project area is classified as Zone X, an area with minimal flood hazard. No additional areas of ecological concern such as wilderness areas, scenic rivers, wildlife areas, wildlife refuges, or wildlife sanctuaries were identified in the Project area.

B(10)(g) Provide any known additional information that will describe any unusual conditions resulting in significant environmental, social, health, or safety impacts.

A Phase I ESA was completed for the Project area following a site visit that was completed on May 11, 2021. One Recognized Environmental Condition (REC), defined as the presence or likely presence of any hazardous substance or petroleum product in, on or at a property due to a release to the environment, under conditions indicative of a release, or under conditions that pose a material threat of a future release, was identified associated with the Project area. The REC was identified in the eastern portion of the Project area which was used as a fruit orchard from 1934 or earlier until at least 1983. Lead and arsenic-containing pesticides were commonly used in orchards from the late 1800s until the mid-1900s. If used in the former orchard, elevated concentrations of metals may be present in soils and could require off-site disposal and/or construction worker health and safety standards. The Phase I ESA report is included in Appendix G. In October 2021, to address the potential for lead or arsenic contaminated soils in the former orchard, POWER completed a Phase II ESA. Soil samples were collected and analyzed for metals of concern to determine if elevated metals concentrations were present within the area of the former orchard. The Phase II ESA concluded that elevated concentrations of metals were not identified in any soil samples, therefore special construction worker health and safety measures to prevent exposure to metals would not be necessary. Second, the Phase II ESA concluded that the concentrations of metals were low enough that the soil would not be classified as hazardous waste if construction requirements necessitated off-site soil disposal. The Phase II ESA is provided in included in Appendix G.

In May 2021, three geotechnical borings and a Wenner Resistivity Survey were conducted within the proposed substation expansion area at the existing Amherst #2 Substation. The resistivity values for the Project appeared geologically reasonable. The report indicates that low-density, very soft to medium stiff and/or very loose to loose soils that exist within the proposed structure, pavement, and fill areas be undercut to expose stiff to very stiff native clayey soils. The report summarized that the geology of the site was suitable for construction of the Woodings Substation and related transmission structures, following the parameters provided in the report (see Appendix H). A second geotechnical site visit was completed in October 2021 for the transmission line structures. Three geotechnical borings and associated laboratory testing were completed for locations near three of the proposed monopole structures along the proposed

transmission line route. The geotechnical report indicated these locations were suitable for monopole construction, following the recommendations provided in the report dated November 18, 2021 and addendum dated November 29, 2021 (Appendix H).

In June 2021, POWER conducted pre-construction audible noise measurements to document the ambient noise conditions along the external perimeter of the Project area and within the substation at the existing transformers. Six test locations were sampled along the perimeter of the existing Amherst #2 Substation property and in the proposed Woodings Substation area. An additional test was performed along the proposed transmission line. Testing was conducted during both daytime and nighttime hours. The two existing transformers were also measured to obtain sound power values for the existing equipment. POWER documented the results in a Noise Survey Analysis report (Appendix I). The report includes existing ambient noise, anticipated construction noise, and future calculated noise associated with substation operation. The results of the study indicate the continuous maximum operating condition of the substation is not expected to exceed the limits imposed by the local resolution established by Amherst Township. The area that shows the largest increase in sound pressure from the new sources is to the south and west of the substation as the transformer is located closer to the property line at these locations. Construction noise for the tie line and the substation is anticipated to increase the ambient noise at a perceived value of over double. Similar to the existing train traffic in this area, the typical sound levels of construction noise expected at any given residence will be sporadic and of limited duration and are anticipated to be perceivable as heavy city traffic to residential areas. No significant environmental, social, health, or safety impacts were identified in relation to construction or future noise.

The FAA was contacted on February 16, 2022, and provided the 138 kV structure and crane locations, heights, and sea level elevations. The FAA responded on March 3, 2022, with a determination of no hazard to air navigation. These letters are included in Appendix J. AMPT's engineering team will coordinate with the FAA during construction to notify them when cranes are in place and structures are erected.

AMPT is not aware of any known unusual conditions that would result in significant environmental, social, or safety impacts in association with this Project.

APPENDIX A PROJECT FIGURES

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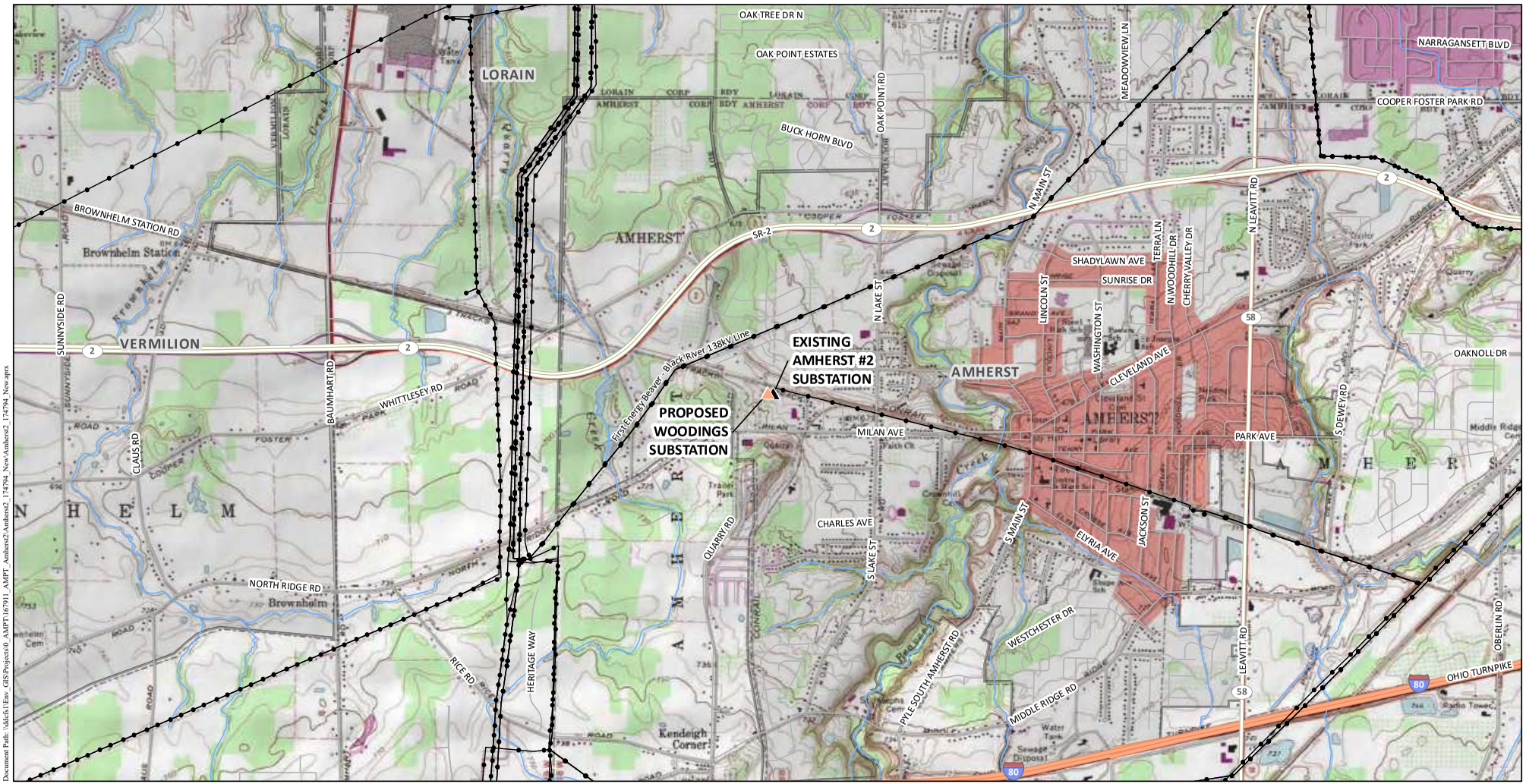


Substation
Proposed Substation
Existing Transmission Line
Interstate
State Highway
Road
Stream (NHD)
Municipality

N
W E
S

1" = 2,000'

0 1,000 2,000
Feet

State of Ohio
Lorain County

NAD 1983 2011 StatePlane Ohio North FIPS 3401 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011

Date: 9/30/2022
Author: jhuniston
POWER: 174794

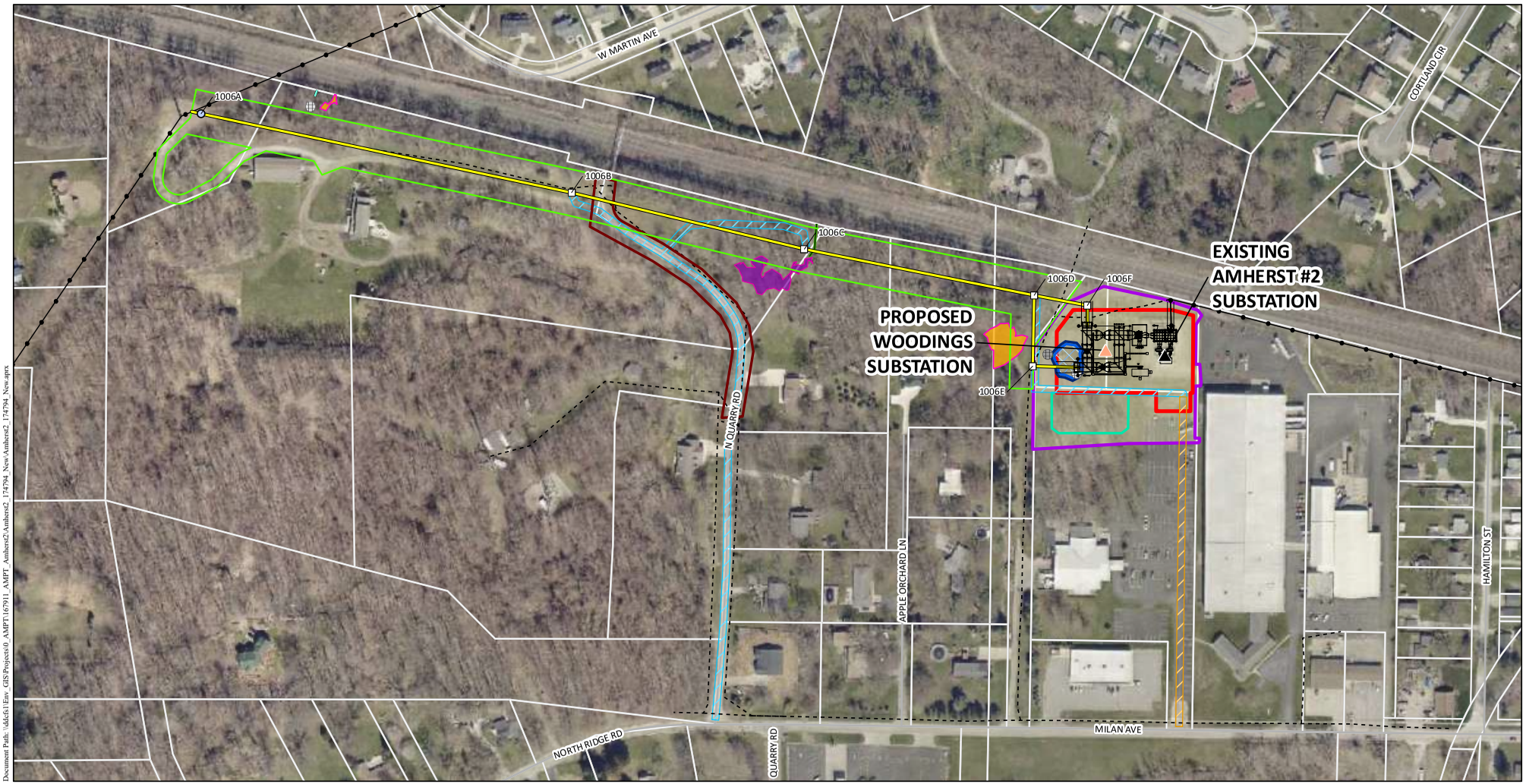
Map 1 of 1

AMP Transmission, LLC
Amherst 2nd Source Reinforcement Project

Figure 1: Project Location

POWER ENGINEERS
AMP TRANSMISSION

Document Path: \\dfs61\Env_GIS\Projects\0_AMPT\16791_AMPT_Amherst2\Amherst2_174794_New\Amherst2_174794_New.aprx



- Substation
- Proposed Substation
- Proposed ATSI Structure
- Proposed AMPT Structure
- Proposed AMPT 138 kV Transmission Line
- Existing Distribution Line
- Existing Transmission Line
- Road
- Substation Retention Pond
- Proposed Substation Boundary
- Grading Limits
- Permanant Access Road
- Temporary Access Road
- Parcel Boundary
- Right-of-Way (ODOT)
- Right-of-Way (100')
- Delineated Wetland (PFO)
- Delineated Stormwater Basin
- Delineated Wetland (PEM)
- Delineated Drainage Ditch
- Delineated Intermittent Stream
- Culvert; Inlet
- Culvert; Outlet

N
W E
S

1" = 200 '

0 100 200
Feet

State of Ohio
Lorain County

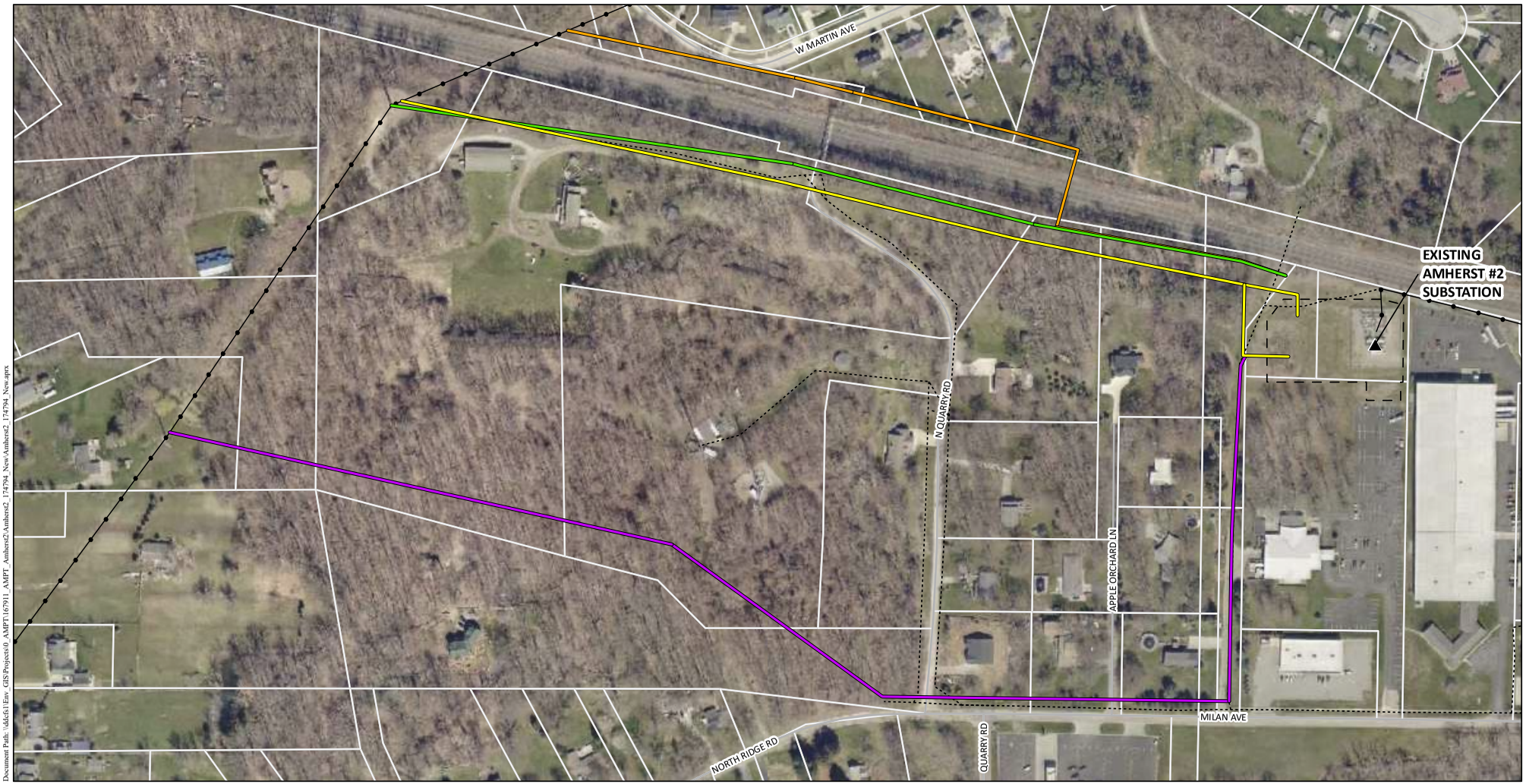
NAD 1983 2011 StatePlane Ohio North FIPS 3401 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011

Date: 9/30/2022
Author: jhumiston
POWER: 174794

Map 1 of 1

AMP Transmission, LLC
Amherst 2nd Source Reinforcement Project
Figure 2: Existing and Proposed Project Features

POWER ENGINEERS
AMP TRANSMISSION



- Substation
- Alternative Route 1
- Alternative Route 2
- Alternative Route 3
- Alternative Route 4
- Proposed Substation Boundary
- Existing Transmission Line
- Existing Distribution Line
- Road
- Parcel Boundary

N
W E
S

1" = 200 '

0 100 200
Feet

State of Ohio
Lorain County

NAD 1983 2011 StatePlane Ohio North FIPS 3401 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011

Date: 9/30/2022
Author: jhumiston
POWER: 174794

Map 1 of 1

AMP Transmission, LLC
Amherst 2nd Source Reinforcement Project

Figure 3: Alternative Transmission Line Routes

POWER ENGINEERS
AMP TRANSMISSION

APPENDIX B PJM SLIDES

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ATSI Transmission Zone

Need Number: ATSI-2019-004
Process Stage: Need Meeting
Date: 01/11/2019

Project Driver(s):
Operational Flexibility and Efficiency
Infrastructure Resilience

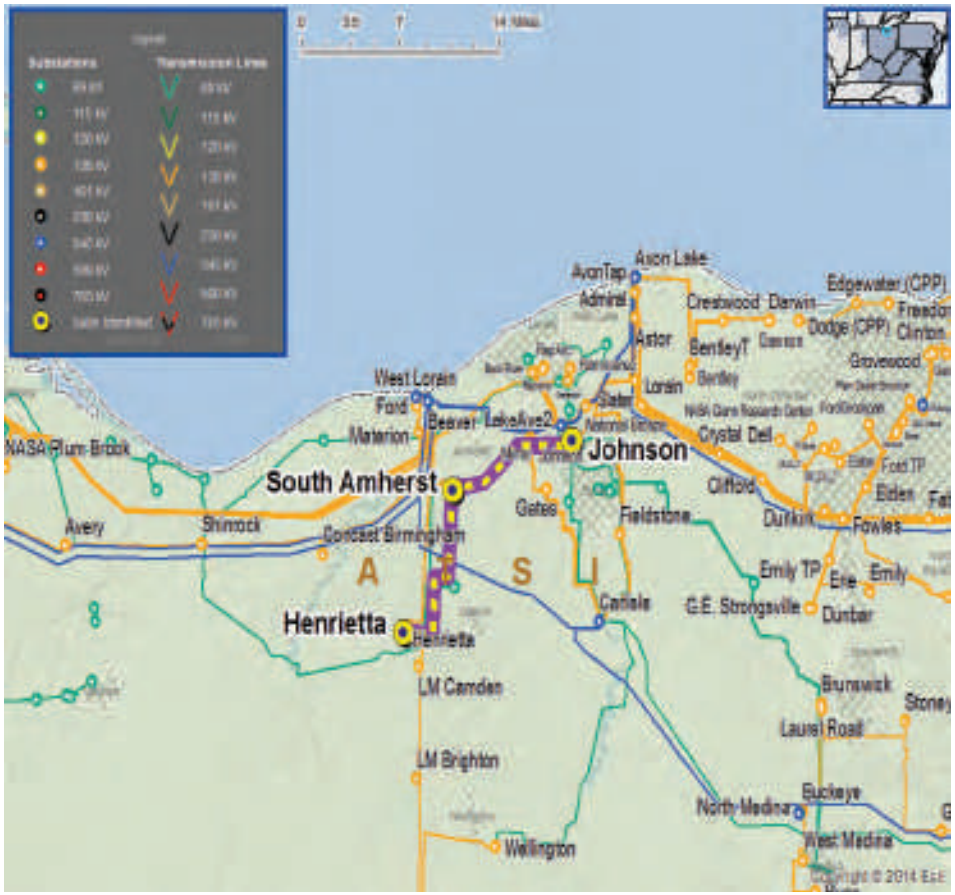
Specific Assumption Reference(s)
Global Considerations

- System reliability and performance
- Substation / Line equipment limits
- Reliability of Non-Bulk Electric System (Non-BES) facilities
- Load and risk in planning and operational scenarios
- Load and/or customers at risk on single transmission lines

Problem Statement
Amherst 69 kV Area

The Amherst 69 kV substation is owned by Amherst Municipality with transmission service from a tapped 69 kV transmission line. The Henrietta-Johnson 69 kV line outage (N-1) results in approximately 39 MW & 9,195 customers at three transmission service points being interrupted.

- Over the past five years, the Henrietta-Johnson 69 kV line has experienced approximately 21 outages (13 sustained , 8 momentary).



PJM SRRTEP

Sub Regional RTEP Committee: Western
AMPT Supplemental Projects

February 18, 2022

Solutions

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

AMPT Projects in ATSI Transmission Zone M3 Process
Amherst, OH

Need Number: AMPT-2021-005

Process Stage: Solution Meeting – 2/18/2022

Process Stage: Need Meeting – 11/19/2021

Supplemental Project Driver(s): Customer Service

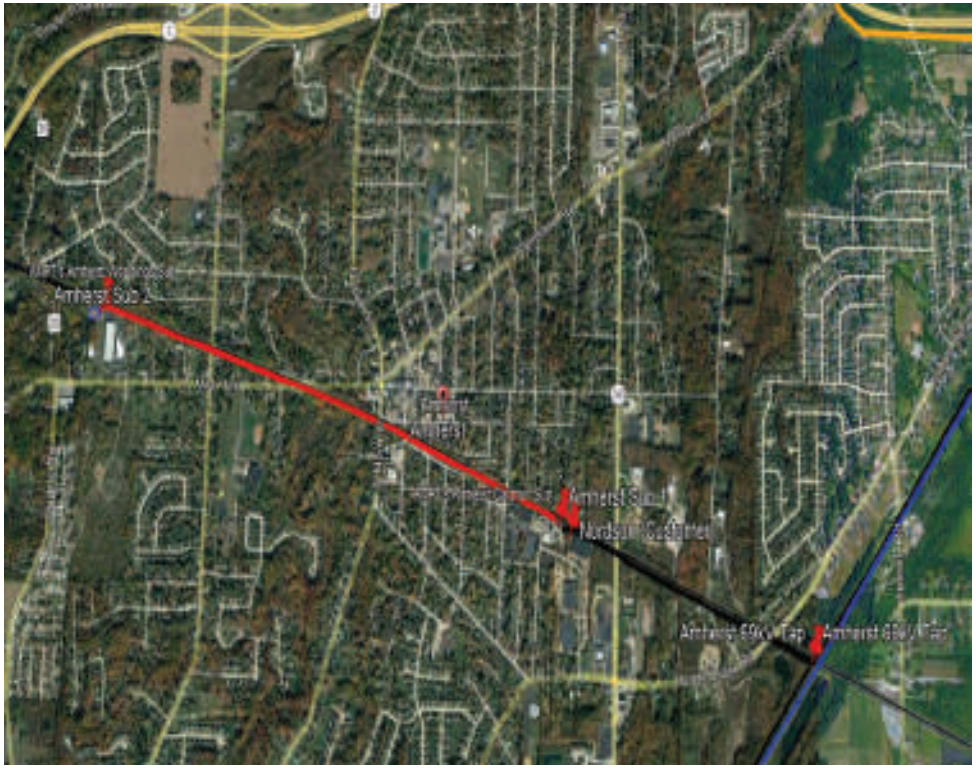
Specific Assumption Reference(s): AMPT Transmission Facilities Interconnection Requirements Document

Problem Statement:

AMPT's Amherst Tap is an approximately 1.85 mile segment of a 2.85 mile radial tap supplied from ATSI's Henrietta-Johnson 69 kV line. Two stations are served off the Tap – Woodings and Cannon.

The City of Amherst has requested a 2nd supply to support the load (approximately 28 MVA). The radial supply presents a single point of failure that jeopardizes reliability for the City.

AMPT's Transmission Facilities Interconnection Requirements specify looped facilities for loads exceeding 5 MVA or 35 MW-mile thresholds.



AMPT Projects in ATSI Transmission Zone M3 Process
Amherst, OH

Need Number: AMPT-2021-005

Process Stage: Solution Meeting – 2/18/2022

Supplemental Project Driver(s): Customer Service

Proposed Solution:

AMPT Identified Scope

- Construct a greenfield 138 kV double circuit line for approximately 0.4 miles using 954 54/7 kcmil ACSS conductor and tap into the existing Beaver-Black River (ATSI) 138 kV line. **($1.53 M)**
- At Woodings (Amherst Sub #2) 69/12 kV Substation - Expand the sub with the installation of three (3) 138 kV circuit breakers; Install one (1) 138/69/12kV 130 MVA transformer; upgrade the 69 kV bus to 2000A, install two (2) 69 kV circuit breakers **($8.8 M)**
- At Cannon (Sub #1) 69/12 kV Substation - Install one (1) 69 kV breaker towards Nordson; Replace 600A bus disconnect switch with one rated at 1200A **($0.92 M)**

*ATSI Identified Scope **($2.8 M**)*

- Design and construct tap structure(s) at tap location
- Upgrade line relaying with new panel at Black River
- Upgrade line relaying with new panel at Beaver
- Install/complete fiber connection to Beaver and Black River substations
- Provide/install four (4) 69 kV revenue metering equipment packages at Amherst Muni substations

AMPT Projects in ATSI Transmission Zone M3 Process
Amherst, OH

Need Number: AMPT-2021-005

Process Stage: Solution Meeting – 2/18/2022

Supplemental Project Driver(s): Customer Service

Proposed Solution: Continued

Alternatives Considered:
Rebuild existing 69 kV line between Woodings and Cannon substation to 69 kV double circuit configuration.

- This option was not selected as a tower outage would still interrupt all the load in the area, temporary facilities would be required during construction, and limited additional ROW.

Ancillary Benefits:

This project to be sequenced prior to FE's project to build the new Dewey 69 kV Substation (s1948). This project will accommodate that work to be completed without the need for temporary facilities.

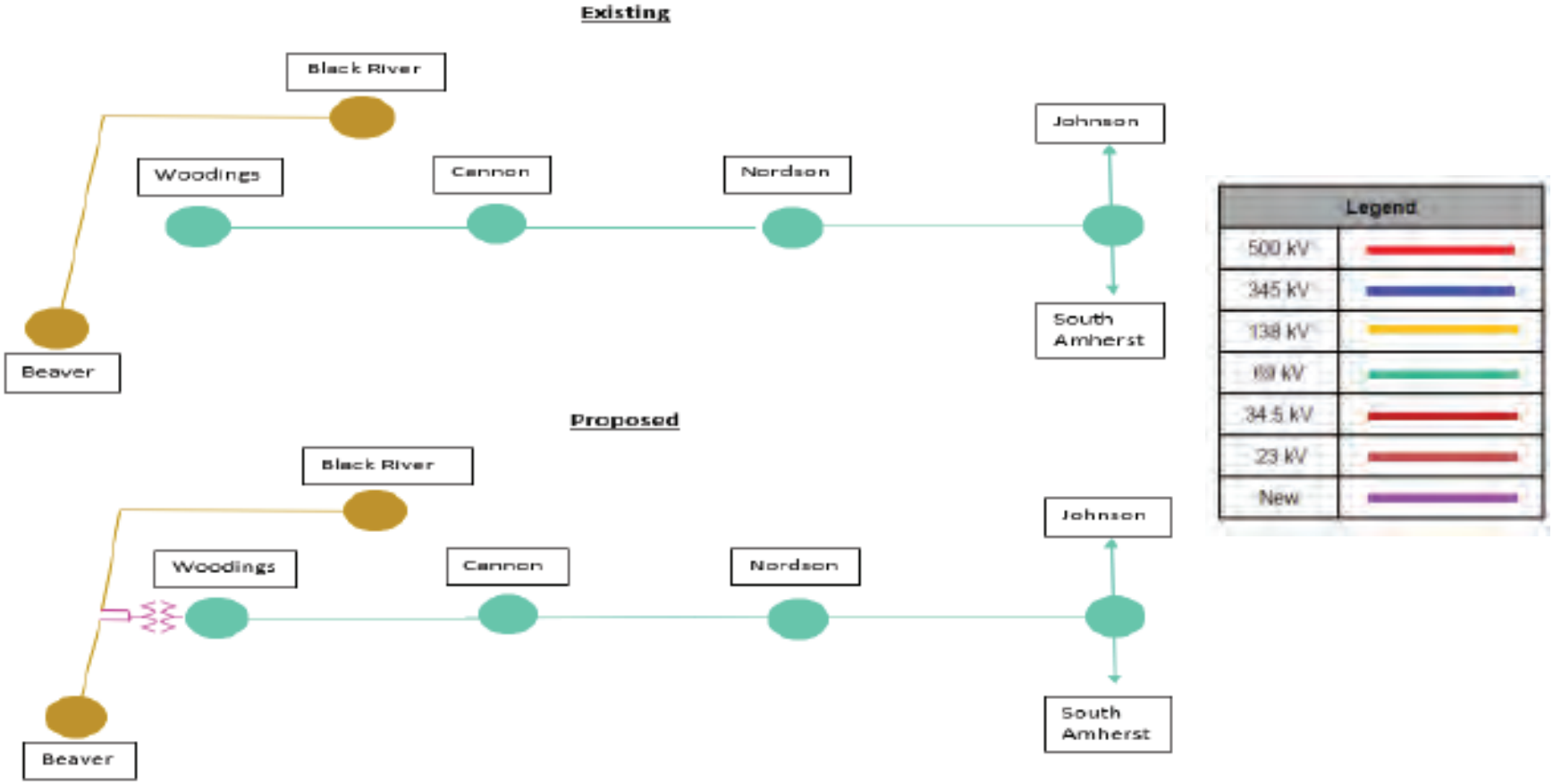
Total Estimated Transmission Cost: $14.05 M

Projected In-Service: 12/31/2023

Project Status: Engineering

AMPT Projects in ATSI Transmission Zone M3 Process

Amherst, OH



APPENDIX C CITY OF AMHERST ORDINANCE

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CITY OF AMHERST, OHIO

OFFICE OF THE
CLERK OF COUNCIL
STREET (440) 988-2420
44001
(440) 988-2570 fax

OLGA SIVINSKI
206 SOUTH MAIN
AMHERST, OH

council@amherstohio.org

A G E N D A

AUGUST 19, 2019 **O-19-35**
SPECIAL MEETING **R-19-06**
7:00 P. M. **A-19-40**

1. Roll call: Mr. Van Treuren, Mr. Dembinski, Mr. Cowger, Mr. Winiarski, Mr. Nahorn, Mr. Heberling, Mr. Janik

2. Prayer: Chaplain Nahorn

3. Pledge to the Flag: Sergeant at Arms Dembinski

4. ORDINANCES AND RESOLUTIONS THIRD READING:

(a) An Ordinance to enter into an agreement with American Municipal Power Transmission, Inc (AMPT) for the sale of the City's 69 kV facilities and the installation of a second transmission line; and declaring an emergency (A-19-39)

5. Adjournment

SPECIAL NOTE: This meeting will be held at Main Street, 255 Park Avenue, Amherst, Oh, due to Council Chambers being under construction

SPECIAL

AUGUST 19 2019

Amherst City Council met in a Special Session under full compliance of State Law with President Wasilk opening the meeting at 7:00 P.M. Roll call: Mr. Van Treuren, Mr. Dembinski, Mr. Cowger, Mr. Winiarski, Mr. Nahorn, Mr. Heberling, Mr. Janik. Also present were Mayor Costilow, Safety/Service Director Jeffreys, Law Director Pecora, Assistant to Law Director Ward, Treasurer Ramsey and Auditor Pittak. There were no members of the Public or Press present.

The Prayer was invoked by Chaplin Nahorn, followed by the Pledge to the Flag led by Sergeant at Arms Dembinski.

ORDINANCES AND RESOLUTIONS THIRD READING:

(a) An Ordinance to enter into an agreement with American Municipal Power Transmission, Inc (AMPT) for the sale of the City's 69 kV facilities and the installation of a second transmission line; and declaring an emergency. (A-19-39)

Mr. Cowger motioned to adopt. Seconded by Mr. Van Treuren. Roll call vote 6-1 to adopt with Mr. Winiarski voting no. Becomes 0-19-35.

Mr. Dembinski motioned to adjourn. Seconded by Mr. Cowger. Voice vote 7-0 to adjourn.

The meeting adjourned at 7:02 p.m.

_____ _____

Olga Sivinski, Clerk of Council Jennifer Wasilk, President of Council

SPECIAL NOTE: This meeting was held at Main Street, 255 Park Avenue, Amherst, Oh., due to Council Chambers being under construction

APPENDIX D EMF ANALYSIS REPORT

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November 3, 2022

AMP TRANSMISSION, LLC

Amherst 2nd Source Reinforcement Project 138 kV Transmission Line

EMF Analysis Report
Revision 1

PROJECT NUMBER:
174794

PROJECT CONTACT:
AMANDA JERRELL
EMAIL:
AMANDA.JERRELL@POWERENG.COM
PHONE:
(314) 851-4103

POWER ENGINEERS

AMHERST 2ND SOURCE REINFORCEMENT PROJECT

PREPARED FOR:

AMP TRANSMISSION, LLC

PREPARED BY:

DYLAN JEPPSON – (207) 869-1471 – DYLAN.JEPPSON@POWERENG.COM
AMANDA JERRELL – (314) 851-4103 – AMANDA.JERRELL@POWERENG.COM

REVISION HISTORY						
REV.	ISSUE DATE	ISSUED FOR	PREP BY	CHKD BY	APPD BY	NOTES
A	2022-03-15	Prelim	JDJ	APJ	GCD	Issued for POWER internal review
B	2022-03-17	Appvl	JDJ	APJ	GCD	Issued for review and approval
C	2022-04-07	Appvl	JDJ	APJ	GCD	Client comments implemented
0	2022-10-21	Impl	JDJ	APJ	GCD	Issued for Implementation
1	2022-11-03	Impl	JDJ	APJ	GCD	Client comments implemented

"Issued For" Definitions:

- "Prelim" means this document is issued for preliminary review, not for implementation
- "Appvl" means this document is issued for review and approval, not for implementation
- "Impl" means this document is issued for implementation
- "Record" means this document is issued after project completion for project file

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1.0 EXECUTIVE SUMMARY

POWER Engineers, Inc. (POWER) performed an electromagnetic field (EMF) analysis for the AMP Transmission (AMPT) Amherst 2nd Source Reinforcement Project. The new 0.4 mile 138 kV transmission line between the Woodings Substation and ATSI Beaver to Black River tap will consist of two (2) circuits, both utilizing 954 kcmil ACSS 54/7 "Cardinal" conductor, and a 3/8" EHS steel shield wire. The 138 kV line is constructed with a steel pole structure for the entirety of the line. A cross-section of the steel pole structure is shown in Appendix A.

The purpose of this study is to perform EMF calculation for the new transmission line and report the results versus the IEEE exposure reference levels for EMF. The analysis includes three different loading cases:

- Case One: Normal Maximum Loading at 1,884 A
- Case Two: Emergency Line Loading at 2,172 A
- Case Three: Winter Normal Loading at 1,976 A

The phasing of both circuits is C-B-A from top to bottom of the structure which produces conservative results. However, cross phasing of the two circuits is recommended when possible; this will produce lower EMF values.

The electric and magnetic fields effects were modeled using the Corona and Field Effects Program (CAFEP) software, developed by Bonneville Power Administration. All calculated values are below the recommended levels specified.

Table 1 shows a summary of the maximum value of all three cases calculated for the Amherst 2nd Source ATSI Beaver to Black River Tap project.

TABLE 1: MAXIMUM CALCULATED VALUES

CALCULATION	MAXIMUM WITHIN ROW	MAXIMUM AT EDGE OF ROW	LIMIT	REFERENCE
Electric Field	2.0 kV/m	0.4 kV/m	5 kV/m	IEEE Std C95.6-2002
Magnetic Field	319 mG	176 mG	9,040 mG	

2.0 METHODOLOGY

2.1 EMF & Corona Effects

The EMF and corona effects analysis was performed using Bonneville Power Administration's CAFEP software. CAFEP uses the electrical and physical characteristics of the transmission line to calculate resulting electric and magnetic fields.

The electric fields are driven by the maximum operating voltage of conductors. Magnetic fields are driven by the line current loading, which varies over time. Therefore, the magnetic fields calculations were performed using the normal maximum, emergency, and winter normal loading conditions.

The values of these effects are typically of concern at various points across the right-of-way (ROW). Therefore, values reported include the maximum values within the ROW for the given structures, along with the calculated values at the edge of the ROW. Also included for reference are plots of the results for all analyzed values across the entire width of the ROW and slightly beyond the ROW. For the analysis, electric and magnetic fields were analyzed at a minimum conductor height, as this location will produce the worst-case scenario.

2.2 Amherst 2nd Source Exposure Reference Levels

The Amherst 2nd Source Reinforcement Projects transmission line is located in Amherst, Ohio which does not have requirements for maximum exposure levels of electric and magnetic fields. IEEE provides exposure reference levels for electric and magnetic fields in IEEE C95.1-2019. These limits are discussed in the results sections.

3.0 STUDY DETAILS

Electric and magnetic fields are based on the electrical and physical characteristics of the transmission line. Specifically, these factors are driven by the voltage and current loading of the line, the physical conductor characteristics and bundling, relationships of each phase conductor to the other phase conductors and shield wires, and the heights of the conductor from the ground. As a result, there are a number of factors that will affect results. Conductor sag varies between each span of the line, thus the minimum conductor height to ground was analyzed for worst-case scenario. The shield wire sag was assumed to be 80% of the conductor sag at this scenario. Elevation of the line does not contribute to electric and magnetic field levels but was included in the report for reference. The data listed in Table 2 and the structure shown in Appendix A were used for the analysis. Should any of this data change, the results will also change.

TABLE 2: SUMMARY OF INPUT DATA	
MEASUREMENT CATEGORY	**DATA**
Voltage	145 kV (105% of nominal)
Frequency	60 Hz
Line Length	0.4 miles
Average Line Elevation	700 feet
Right-of-Way (ROW) Width	100 feet
Conductor	954 kcmil ACSS 54/7 “Cardinal”
OHGW	3/8” EHS Steel
Minimum Conductor Height to Ground	37.2 feet*

* Value is the minimum vertical distance to the ground below the conductor.

4.0 RESULTS

4.1 Electric Field

The electric field strength is a measure of the force per unit charge at a given point in space relative to a charged object. It is typically measured in volts or kilovolts per meter (kV/m). Results show that for the 138 kV line at a maximum voltage 105% of nominal the maximum value within the ROW is 2.0 kV/m and the largest value at the edges of the ROW is 0.4 kV/m. Values are calculated at the minimum conductor height at a height of 1.0 m (3.28 ft) above the ground per IEEE Std 644-2019.

IEEE Std C95.1-2019 recommends exposure reference levels (ERL) of 20 kV/m in a controlled environment, 5 kV/m for general public (edge of ROW), and 10 kV/m within power line rights-of-way under normal load conditions. All values within the ROW and edge of ROW are below general public level of 5 kV/m.

Figure 1 shows the electric fields across the ROW for the Amherst 2nd Source transmission line. Electric field is driven by the voltage of the line. Therefore, the results shown in Figure 1 for each of the three loading cases are identical as the voltage of the line remains at 145 kV (105% of 138 kV nominal).

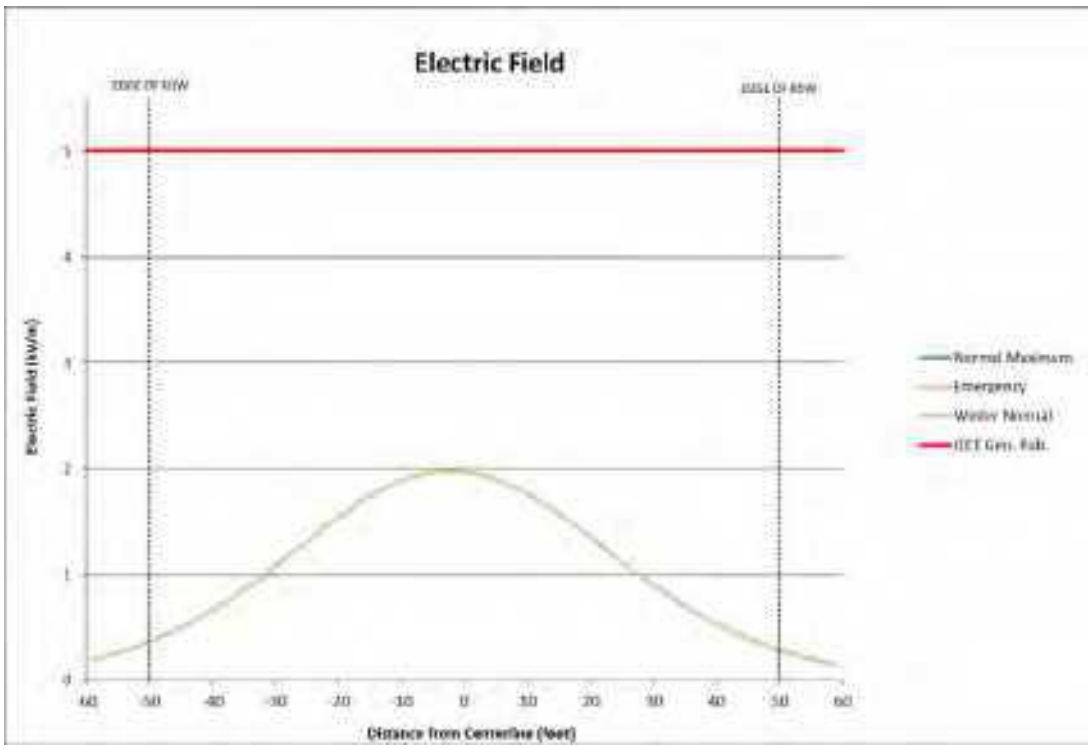


Figure 1: Amherst 2nd Source Transmission Line Electric Fields

4.2 Magnetic Field

The reported magnetic field values are the magnetic flux density at a given point in space. Magnetic flux density is measured in gauss or milligauss (mG). Magnetic fields are calculated with the normal maximum, emergency, and winter normal currents per phase. IEEE Std C95.1 reference levels for the general public for magnetic fields are 9,040 mG.

Table 3 shows a summary of the magnetic field values in the ROW as well as the largest values at the edges of the ROW for the transmission line section analyzed. Values are calculated at the minimum conductor height at a height of 1 m (3.28 ft) above the ground per IEEE Std 644-2019.

TABLE 3: CALCULATED MAGNETIC FIELD MAGNITUDES

LOAD CONDITIONS	MAXIMUM WITHIN ROW	MAXIMUM AT EDGE OF ROW
Normal Maximum	276 mG	153 mG
Emergency	319 mG	176 mG
Winter Normal	290 mG	160 mG

IEEE Std C95.1-2019 provides ERL magnetic field levels of 0.904 mT (9,040 mG) for the general public, and 2.71 mT (27,100 mG) in a controlled environment. All calculated values within the ROW and the edge of ROW are below both the general public and the controlled environment ERL levels.

Figure 2 shows a plot of the magnetic field across the ROW for the Amherst 2nd Source transmission line.

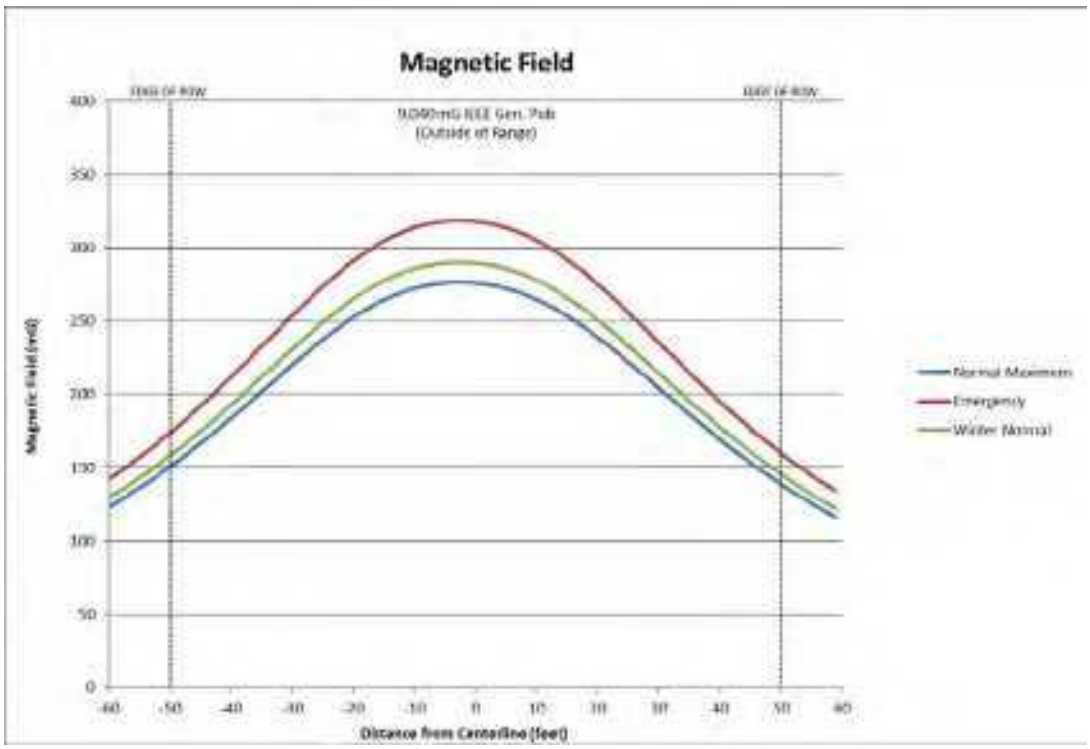
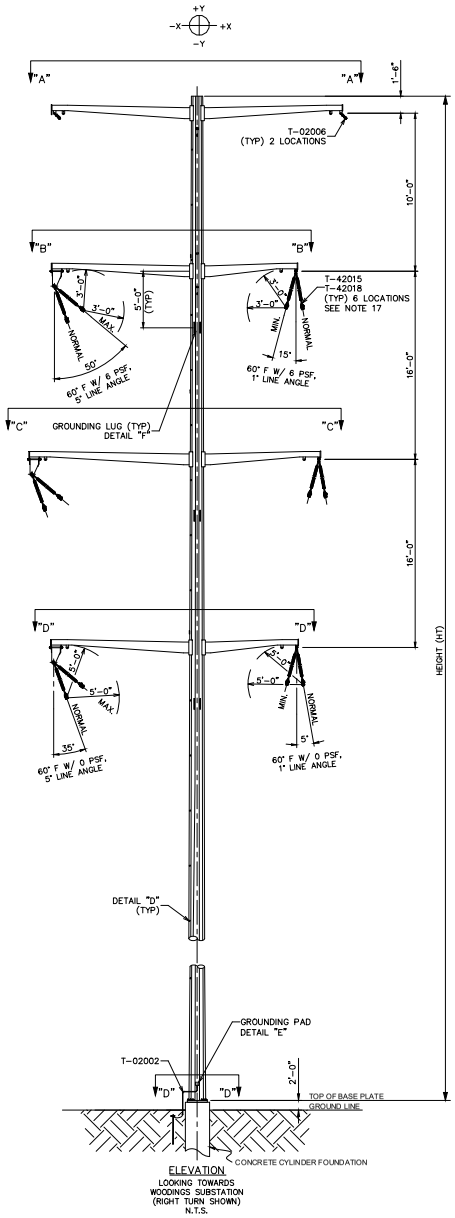


Figure 2: Amherst 2nd Source Transmission Line Magnetic Fields

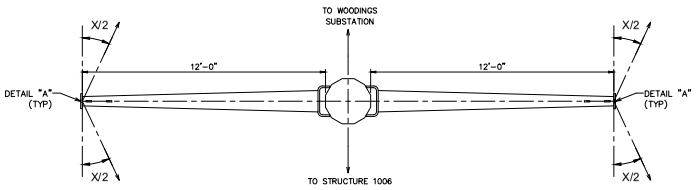
5.0 CONCLUSION

The results of the analysis performed demonstrate that IEEE exposure reference levels for electric and magnetic fields are not exceeded with the new Amherst 2nd Source transmission line. The phasing in the analysis of the new transmission line produces conservative results. Therefore, other phasing configurations will meet the exposure levels stated by IEEE. The results show that the EMF levels are below general public limits within the ROW. If the width of the ROW changes, then the exposure levels will not be exceeded as the general public levels for EMF are met within the ROW.

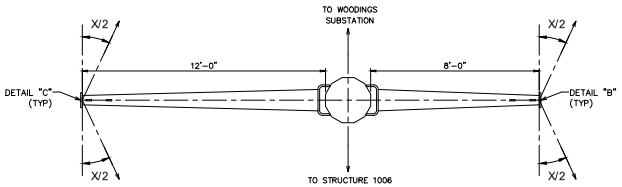
APPENDIX A – STRUCTURE DATA



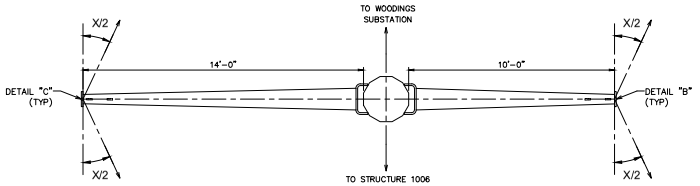
ELEVATION
LOOKING TOWARDS WOODINGS SUBSTATION (RIGHT TURN SHOWN)
N.T.S.



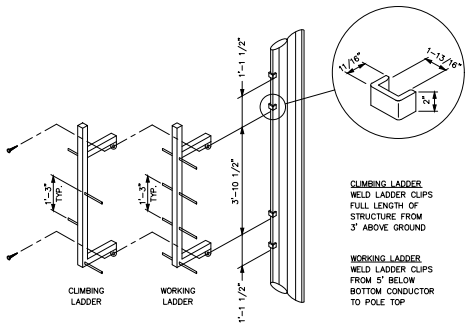
SECTION "A–A"
N.T.S.



SECTION "B–B" & "D–D"
N.T.S.



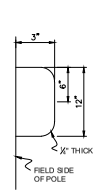
SECTION "C–C"
N.T.S.



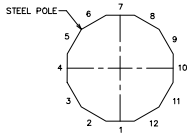
CLIMBING LADDER
WELD LADDER CLIPS FULL LENGTH OF STRUCTURE FROM 3' ABOVE GROUND

WORKING LADDER
WELD LADDER CLIPS FROM 5' BELOW BOTTOM CONDUCTOR TO POLE TOP

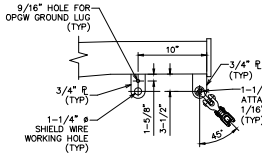
DETAIL "D"
CLIMBING PROVISION BRACKET
(LADDER NOT REQ'D)



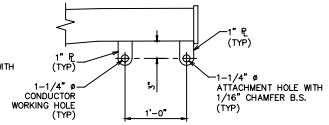
DETAIL "F"
GROUNDING LUG
STAINLESS STEEL PAD
LOCATED ON FLATS 4 & 10
N.T.S.



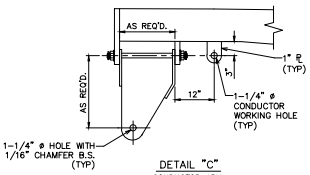
SECTION "D–D"
FLAT DESIGNATION DETAIL



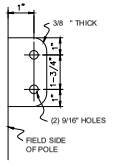
DETAIL "A"
SHIELD WIRE ARM
END WITH WORKING HOLE
N.T.S.



DETAIL "B"
CONDUCTOR ARM
END WITH WORKING HOLE
N.T.S.



DETAIL "C"
CONDUCTOR ARM
END WITH SWING BRACKET
AND WORKING HOLE
N.T.S.



DETAIL "E"
GROUNDING PAD
STAINLESS STEEL NEMA 2–HOLE PAD WITH
1/2" – 13 UNC TAPPED HOLES
N.T.S.

BILL OF MATERIAL		
ASSY.	QTY.	DESCRIPTION
T-02002	1	GROUNDING ASSEMBLY, STD. 69kV AND 138kV POLES
T-02006	2	OHGW SUSPENSION ASSEMBLY
T-42015	6	SUSPENSION ASSEMBLY, ACSS CARDINAL
T-42018	6	POLYMER, SUSPENSION INSULATOR ASSEMBLY, 138kV

STR. NO.	HEIGHT (HT)	STRUCTURE ORIENTATION	LINE ANGLE (X)
1006B	130'	RT	1.6°
1006C	120'	LT	-2.3°

NOTES:

1. DESIGN AND FABRICATION OF STEEL POLES SHALL BE IN ACCORDANCE WITH AMPT SPEC. NO. 337116-23, ANSI C2, AND ASCE 48-11, LATEST REVISION. IN THE EVENT THAT FABRICATION DETAILS ON THIS DRAWING CONFLICT WITH SPECIFICATIONS, DETAILS ON THIS DRAWING SHALL BE USED.
2. POLE SUPPLIER SHALL VERIFY THAT DIMENSIONS OF ALL SHIELD WIRE AND CONDUCTOR ATTACHMENTS PROVIDE CAPACITY FOR CONTROLLING PERMANENT WIRE LOADS.
3. TRANSITION LADDERS TO BE LOCATED AT SLIP JOINT TO ALLOW FOR CLIMBING IN ACCORDANCE WITH OSHA.
4. ALL LADDERS SHALL BE CLIMBING LADDERS WITH FALL PROTECTION OR TIE-OFF LUGS INSTALLED ON LADDER CLIPS. POLE SUPPLIER SHALL INSTALL LADDER CLIPS ON POLE FOR ALL LADDERS. ADDITIONAL CLIMBING LADDERS, TO BE UTILIZED AS REMOVABLE LADDERS, SHALL ONLY BE PROVIDED BY THE POLE SUPPLIER WHEN IDENTIFIED IN THE PURCHASE ORDER. CLIMBING LADDER CLIPS ARE TO BE APPLIED FROM THE TOP OF THE POLE DOWN, ENSURING ONLY FULL LADDER SECTIONS ARE REQUIRED.
5. RIGHT TURN DEPICTED BY POSITIVE ANGLE (X/2). LEFT TURN DEPICTED BY NEGATIVE ANGLE (-X/2).
6. ATTACHMENT VANGS SHALL BE DESIGNED FOR ±10° FROM THE PULL-OFF ANGLES.
7. WORKING HOLES SHALL BE DESIGNED FOR EQUAL LOADS AS THE CORRESPONDING ATTACHMENT HOLE.
8. FABRICATOR TO STAMP, MARK, OR PUNCH THE 12 POSITION ON THE TOP AND BOTTOM OF EACH POLE SECTION AS AN AID TO CONSTRUCTION.
9. LIMIT MAXIMUM DIAMETER OF THE BASE SECTION TO 60 INCHES OR DIAMETER OF THE AB CIRCLE TO 72 INCHES. POLE TAPER SHALL ADHERE TO MINIMUM AND MAXIMUM RANGES STATED IN SPECIFICATION 337116-23.
10. THE STRUCTURE OUTLINE IS DIAGRAMMATIC ONLY, AND NOT TO BE CONSIDERED RESTRICTIVE BEYOND GIVEN DIMENSIONS. GEOMETRIC SHAPES GIVEN IN THE DETAILS ARE ALSO NOT RESTRICTIVE.
11. THE FABRICATOR SHALL PROVIDE SUFFICIENT LIFTING VANGS TO FACILITATE ERECTION OF THE STRUCTURE. PICK-UP POINTS SHALL BE IDENTIFIED ON THE STRUCTURE ERECTION DRAWINGS.
12. STEEL POLES SHALL BE GALVANIZED.
13. STRUCTURES SHALL INCLUDE GROUNDING ATTACHMENTS.
14. FABRICATOR SHALL PROVIDE JACKING NUT, 1" DIA., ALONG WITH PROCEDURE AND ASSEMBLY INSTRUCTIONS FOR SLIP JOINT.
15. REFER TO T-02002 FOR STEEL GROUNDING ASSEMBLY.
16. ASSUME 1 PERCENT UPSWEEP ALL DAVIT ARMS.
17. ASSUME 5.3 FEET FOR INSULATORS LENGTH.

REFERENCES:

LOAD TREE TBL - ST POLE 138kV LA DC _____ BVR-WDG-41002
HDW & ASS'Y - STEEL POLE GROUNDING _____ T-02002
HDW & ASS'Y - OHGW SUSP. ASS'Y. _____ T-02006
HDW & ASS'Y - 138kV SUSP. INSULATOR _____ T-42015
HDW & ASS'Y - 138kV SUSP. CLAMP _____ T-42018

REV	DATE	DFT	APV	WO#	DESCRIPTION
0	11/11/22	SCL	SCM		ISSUED FOR CONSTRUCTION

REVISIONS

AMP TRANSMISSION
AMP Transmission, LLC

CITY OF AMHERST, OHIO
BEAVER - WOODINGS

STRUCTURE OUTLINE DRAWING
138kV LA DC (1°-5°) STEEL POLE

SCALE: AS NOTED
BVR-WDGS-41001
REV. 0

APPENDIX E PHASE I CULTURAL RESOURCES SURVEY REPORT

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In reply refer to
2021-LOR-52069

July 19, 2021

Lindsey Weeks
Power Engineers, Inc.
11733 Chesterdale Road
Cincinnati, Ohio 45202

Dear Ms. Weeks:

RE: Amherst #2 Substation Expansion and 138 kV Transmission Line, Amherst, Lorain County, Ohio

This is in response to the receipt, on July 7, 2021, of additional information regarding *Phase I Cultural Resources Survey Report, Amherst #2 Substation Expansion and 138 kV Transmission Line Project Lorain County, Ohio.* The comments of the Ohio Historic Preservation Office are submitted in accordance with the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended.

Subsurface testing and intensive visual inspection of the project area failed to identify any previously unrecorded archaeological sites. Based on the information submitted, it is my opinion that the proposed workspace for the undertaking will not affect properties listed in or eligible for listing in the National Register of Historic Places. No further coordination is required unless the project changes or archaeological remains are discovered during the course of the project. In such a situation, this office should be contacted as per 36 CFR 800.13.

Please be advised that this is a Section 106 decision. This review decision may not extend to other SHPO programs. If you have any questions, please contact me at (614) 298-2000, or by email at nyoung@ohiohistory.org.

Sincerely,

Nathan J. Young, Project Reviews Manager
Resource Protection and Review

June 17, 2021

AMP TRANSMISSION, LLC

Amherst #2 Substation Expansion and 138 kV Transmission Line Project

Phase I Cultural Resources Survey Report
Lorain County, Ohio

PROJECT NUMBER:
166791.02.05
PROJECT CONTACT:
Lindsey Weeks
EMAIL:
lindsey.weeks@powereng.com
PHONE:
513-326-1556

POWER ENGINEERS

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Amherst #2 Substation Expansion and 138 kV Transmission Line Project
Phase I Cultural Resources Survey Report
Lorain County, Ohio

LEAD PUBLIC AGENCY:
OHIO POWER SITING BOARD

PREPARED FOR:
AMP TRANSMISSION, LLC
111 SCHROCK ROAD, SUITE 100
COLUMBUS, OH 43229

PREPARED BY:
POWER ENGINEERS, INC.
11733 CHESTERDALE ROAD
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JUNE 2021

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ABSTRACT

On May 11 and 12, 2021, personnel from POWER Engineers, Inc. (POWER) performed a Phase I Cultural Resources Survey for AMP Transmission, LLC's (AMPT) proposed Amherst #2 Substation Expansion and 138 kilovolt (kV) Transmission Line Project (Project) in Lorain County, Ohio. The investigation was undertaken in support of the Letter of Notification Application to the Ohio Power Siting Board, a state agency; as such, the Project falls under jurisdiction of the Ohio Administrative Code 4906-6. The Project entails the expansion of the Amherst #2 Substation and the construction of a 0.4-mile 138 kV double-circuit transmission line. The Project is located north of the intersection of Milan Avenue and Apple Orchard Lane in the City of Amherst. The Project encompasses 16.0 acres, of which 1.7 acres are on City of Amherst property. The existing Amherst #2 Substation is on City of Amherst owned property.

A file review was undertaken using the Ohio Online Mapping System prior to fieldwork to identify cultural resources recorded within 0.5 mile of the Project. There are four previously recorded historic architectural resources (LOR0012117, LOR0003617, LOR0010517, and LOR0002917) and one cemetery (OGSID 6966) within 0.5 mile of the Project, none of which are recommended as eligible for the National Register of Historic Places (NRHP) nor are they within the Project Area of Potential Effect (APE). None of the previously recorded resources will be directly or indirectly impacted by the Project.

The APE for historic and prehistoric archaeological resources was limited to the areas of direct ground disturbance from the Project. The archaeological APE encompasses the entire 16.0-acre Project area. Approximately 7.4 acres on the western portion of the Project and the 1.7-acre portion of the Project on City of Amherst owned property on the eastern end of the Project were only visually inspected due to prior disturbance caused by quarrying activities, shallow bedrock, underground utility lines, inundation, underdrainages, and a stormwater basin. In addition, an area encompassing 1.0 acre along the southeastern portion of the proposed transmission line right-of-way was visually inspected due to the presence of a new housing development. Only the remaining 5.38 acres located at the eastern and southeastern portions of the Project were shovel tested for archaeological resources, which included the excavation of 26 shovel tests. Approximately 20 percent of the Project area had sufficient (greater than 50 percent) ground surface visibility to perform a visual survey only. No archaeological sites were identified as a result of the survey.

The architectural APE is defined as the area within both 0.5 mile and in view of the Project. Impacts on resources can either be direct, physical alterations to the resource itself, or indirect, an alteration to the setting of the resource. Four newly documented architectural resources (B-01, B-02, B-03, B-04) constructed before 1971 were identified within view of the Project. Two of the newly recorded historic architectural resources are not recommended as contributing or eligible for the NRHP due to changes or alterations, and/or lack of defined style, and two of the newly recorded architectural resources were not assessed due to lack of access. Due to existing, unrelated transmission lines already a part of the view shed, none of the resources will be negatively impacted. None of the newly recorded architectural resources will be directly impacted by the Project.

TABLE A-1 NEWLY RECORDED HISTORIC ARCHITECTURAL RESOURCES

FIELD ID	RESOURCE TYPE	ADDRESS	DATE	NRHP RECOMMENDATION
B-01	Residence	1165 Milan Avenue, Amherst, OH 44001	1963	Not Eligible
B-02	Residence	287 Crosse Road, Amherst, OH 44001	1964	Not Eligible
B-03	Residence	295 Crosse Road, Amherst, OH 44001	1958	Not Assessed
B-04	Residence	976 West Martin Avenue, Amherst, OH 4401	1830 and 1900	Not Assessed

Based on the results of the Phase I cultural resources survey, no potentially significant cultural resources would be affected by the proposed undertaking. In accordance with 38 Code of Federal Regulations 800.4, POWER, on behalf of AMPT, has made a reasonable and good-faith effort to identify historic properties within the potential disturbance area of the Project. POWER recommends that the Project will have no effect on known historic properties and no further work is recommended in connection with the proposed undertaking. However, in the event that cultural resources, human remains, or burial objects are inadvertently discovered at any point during construction, use, or ongoing maintenance in the Project area, all work should cease and appropriate unanticipated discoveries protocols should be implemented.

TABLE OF CONTENTS

TABLES:

APPENDICES:

ACRONYMS AND ABBREVIATIONS

AMPT	AMP Transmission, LLC
APE	Area of Potential Effect
B.P.	Before Present
C.F.R.	Code of Federal Regulations
°F	degrees Fahrenheit
GPS	Global Positioning System
kV	kilovolt
LON	Letter of Notification
NETR	National Environment Title Research
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
OHC	Ohio History Connection
OHPO	Ohio Historic Preservation Office
OPSB	Ohio Power Siting Board
POWER	POWER Engineers, Inc.
Project	Amherst #2 Expansion and 138 kV Transmission Line Project
ROW	right-of-way
USGS	United States Geological Survey
USDA	United States Department of Agriculture

1.0 INTRODUCTION

This report presents POWER Engineers, Inc.'s (POWER) results of a Phase I Cultural Resources Survey for AMP Transmission, LLC's (AMPT) proposed Amherst #2 Substation Expansion and 138 kilovolt (kV) Transmission Line Project (Project) in Lorain County, Ohio (Appendix A: Figure 1-4). The Project entails the expansion of the Amherst #2 Substation and the construction of a 0.4-mile 138 kV transmission line. The Project is located north of the intersection of Milan Avenue and Apple Orchard Lane in the City of Amherst. The Project encompasses 16.0 acres, of which 1.7 acres are on City of Amherst property (parcel ID numbers 0500003106018 and 0500003106020) (Appendix B: Ohio History Connection [OHC]: Archaeological Survey Permit). The existing Amherst #2 Substation is on City of Amherst owned property.

The proposed undertaking requires completion of the Letter of Notification (LON) Application to the Ohio Power Siting Board (OPSB), a state agency of Ohio; as such, the Project falls under jurisdiction of the Ohio Administrative Code 4906-6. At this time, no federal permits, licenses, or funds have been identified for the Project. The Project will require an OPSB LON, under the Ohio Revised Code 149.53, therefore, AMPT is required to provide the Ohio Historic Preservation Office (OHPO) with an opportunity to review and comment on the Project's potential to adversely affect significant historic properties located within the potential disturbance area of the Project. The Phase I archaeological and architectural survey methodology and report format and design follow the OHPO's Archaeology Guidelines (OHPO 1994) and Guidelines for Conducting History/Architecture Survey in Ohio (OHPO 2014).

The research summarized in the Phase I Cultural Resources Survey Report was performed by Principal Investigator Jahleen 'Liz' Sefton, MA, RPA and Tanner Haynes, MA, RPA. Fieldwork was conducted by Jahleen Sefton on May 11 and 12, 2021. Both Jahleen Sefton and Tanner Haynes meet the Secretary of the Interior's *Professional Qualifications Standards for Archeology and Historic Preservation* (48 Federal Register 22716 or 36 Code of Federal Regulations [C.F.R.] 61).

2.0 ENVIRONMENTAL CONTEXT

2.1 Physiography and Hydrology

Lorain County, Ohio is located within the Erie Lake Plains physiographic regions, which is characterized by Wisconsin-Age glaciation that manipulated the landscape over periods of glacial advance and retreat, forming a glacial lake in the northern part of the county (Brockman 1998). As an area of lake plain physiography, Lorain County has a topography that is level to nearly level landscapes interrupted by sand ridges, shoreline cliffs and high areas underlain by sandstone and shale bedrock, and deep gorges of major streams (Ernst and Musgrave 1970). Sandy soils on ridges are remnants of beach ridges that were formed by wave action on the Lake Erie shoreline. Three prominent ridges mark the stages of Lake Erie during the glacial retreat. The Project area is located between two of these major ridges, the Lake Whittlesey and Lake Warren shoreline, which generally follows Center Ridge Road and North Ridge Road, respectively (Ernst and Musgrave 1970; Hansen 1989; Herdendorf 2010). Within the Project area, elevations along the Lake Whittlesey and Lake Warren shorelines range from 760 to 665 above mean sea level, and 725 to 680 feet above mean sea level, respectively. Beach ridges are elevated, well drained features that were used by early settlers as east to west routes (Ernst and Musgrave 1970).

The Project is within the Beaver Creek watershed. Northwestern Lorain County's numerous creeks and lesser tributaries flow in a northernly to northeasterly direction, draining into the Beaver Creek or Vermillion River, and then into Lake Erie. The Beaver Creek and the Vermillion River were an important transportation route and resource for northern Ohio inhabitants during the prehistoric and historic periods.

2.2 Geology and Geomorphology

The Project is underlain by Berea Sandstone and Bedford Shale, which consists of sedimentary rock of Devonian and Mississippian age (Slucher et al. 2006). The parent materials for northern Lorain County soils are Pleistocene-age glacier till and lacustrine sediment (Ernst and Musgrave 1970). Other dominant parent materials in the County are recent alluvium deposited by modern-day streams and organic material (Ernst and Musgrave 1970). The eastern portion of the Project is on very deep, well drained sandy soils that were deposited on beach ridges and relict longshore bars of the Lake Whittlesey and Lake Warren shoreline (Natural Resource Conservation Service [NRCS] 2021). The entire western half of the Project is located on a landform of exposed sandstone bedrock that has been extensively quarried. Quarry scarring is evident by deep cuts in the bedrock and stacked piles of large sandstone boulders (NRCS 2021). Soil descriptions specific to the Project survey area are described in Table 1 (Appendix A: Figure 5).

TABLE 1 SOILS WITHIN PROJECT SURVEY AREA

MAP UNIT SYMBOL	MAP UNIT NAME	SETTING	PROFILE (INCHES)	DRAINAGE
EnA	Elnora loamy fine sand, 1 to 3 percent slopes	Beach ridges and relict longshore bars on lake plains; formed in sandy glacial lake, eolian, and deltaic plains of Wisconsin Age	0-21: loamy fine sand 21-72: fine sand	Moderately well drained
JsA	Jimtown sandy loam, 0 to 2 percent slopes	Wisconsinan Age outwash deposits onstream terraces, outwash terraces, outwash plains, and beach ridges	0-26: loam; 26-31: clay loam 26-31: gravelly loam 31-37: gravelly loam 37-42: sandy loam 42-60: gravelly loamy sand	Somewhat poorly drained
OtB	Oshtemo sandy loam, 2 to 6 percent slopes	Stratified loamy and sandy deposits on outwash plains, valley trains, moraines, and beach ridges.	0-35: sandy loam 35-60: loamy sand 60-80: sand and gravelly sand	Well drained
Qu	Quarries	Open pit mine on sandstone ridge	-	-

Source: Natural Resource Conservation Service 2021.

2.3 Climate

Regional studies indicate that several climate shifts occurred during the Pleistocene and Holocene periods (e.g., Delcourt and Delcourt 1987; Holloway and Bryant 1985; Shane et al. 2001). Approximately 21,400 before present (B.P.), the last (Wisconsin) glacial maximum occurred followed by its subsequent retreat, marking the beginning of a late Pleistocene warming period that spanned 12,500 to 9,500 B.P. The warming trend once again continued throughout the early Holocene and middle Holocene, though reversed to a cooler and wetter climate during the Middle Archaic. The climate again shifted to a warmer climate similar to the present day during the Late Archaic period.

The modern climate of north central Lorain County consists of moderately warm summers and cold winters with moderate snowfall. Temperatures in the winter and summer are on average 19.8 degrees Fahrenheit (°F) and 83.5°F, respectively (National Oceanic and Atmospheric Administration 2021).

2.4 Flora and Fauna

Before European contact, the area was primarily deciduous woodland of northern red oak, beech, hemlock, white pine, elm, hickory, white ash, black cherry, basswood, and sugar maple (NRCS 2021). Most of the forests have been cleared for agriculture and lumber. Remaining stands of woods are primarily along riparian zones flanking streams and in residential areas.

Now-extinct Pleistocene megafauna that once roamed Ohio include mastodons, tundra muskox, bison, ground sloth, and caribou (McDonald 1994). As climate conditions gradually shifted to warmer and drier conditions, Pleistocene species went extinct or migrated with the receding cooler climate (Holloway and Bryant 1985). Common species that have remained dominant over the last few thousand years include bison, elk, black bear, gray wolf, mountain lion, lynx, and red fox (United States Department of Agriculture [USDA] 2006). The USDA (2006) presently reports common mammals in the region including the common cottontail, raccoon, deer, skunks, opossum, and several types of squirrels. In the wetlands, beavers and muskrats are found. Many waterfowl and marsh birds, including black duck and great blue heron, inhabit northern Indiana. These resources provided a rich diet to the prehistoric and early historic peoples of the area.

3.0 CULTURAL BACKGROUND

3.1 Prehistoric Context

3.1.1 Paleoindian Period (15,000 to 10,000 B.P.)

The prehistory of northern Ohio can be generally divided into five periods based on technological and environmental changes recorded in dateable archaeological contexts throughout the region. The earliest known human habitation in Ohio is the Paleoindian period, which dates from approximately 15,000 to 9,000 B.P. (Lepper 2005). Currently, there is limited but growing evidence for pre-Clovis occupation within Ohio. Sites such as Meadowcroft Rockshelter in Western Pennsylvania (Adovasio et al. 1977) and the Gault site in Central Texas (Williams et al. 2018) indicate occupation of North America since at least 16,000 B.P.

The climate of the late Pleistocene within Ohio was a harsh subarctic environment that supported diverse mammalian fauna, such as the mammoth, mastodon, tundra muskox, and caribou. As glaciers retreated about 9,500 B.P., climate, vegetation, and habitat changed, forcing Paleoindians to adapt as food sources went extinct (McDonald 1994). Some of these adaptations are reflected in the changes within the technological tool kit from the Early (later than 12,500 B.P.) and Middle (12,200 to 11,600 B.P.) Paleoindian occupation, which utilized fluted biface technology, and the Late Paleoindian occupation (11,600 to 10,000 B.P.), marked by unfluted point forms such as Dalton and Plano (Prufer and Baby 1963; Purtill 2009; Lothrop et al. 2016).

The Early Holocene is marked by a warming trend that brought about stable resources which led to increased populations and intraregional mobility. As sub-regional groups emerged, the use of local raw materials for stone tool production increased along with greater variability in tool kit design and restricted projectile point distributions (Stothers 1996; Purtill 2009; Lothrop et al. 2016). As climate changes developed, existing Late Paleoindian populations of northern Ohio either moved north to follow shifting ecological niches or adapted to early Holocene environments (Brose 1975; Kozarek et al. 1994; Stothers et al. 2001).

3.1.2 Archaic Period (10,000 to 2,500 B.P.)

During the Early Archaic period (10,000 to 8,000 B.P.) vast forests, swampland forests, and grasslands grew in areas once glaciated. Early Archaic populations in Ohio generally occupied areas once dominated by open forests (Purtill 2009) and along the northern Lake Erie shore, particularly in the Lake Plains region of northwest and north-central Ohio. In northwestern Ohio, tool assemblages from this time period suggest caribou hunting played a major part in subsistence (Stothers 1996; Stothers et al. 2001). In eastern Ohio, subsistence strategies focused on hunting white-tailed deer, elk, and moose, a shift that did not occur in northwestern Ohio until about 9,500 to 9,000 B.P. (Blank 1970; Stothers et al. 2001; Chidester 2011).

During the Middle Archaic period (8,000 to 6,000 B.P.), northern and western Ohio experienced an increase in precipitation unlike the Hypsithermal warming and drying trend occurring in western states at the time. The reduction in the number of Middle Archaic sites suggests the occupation of the region reduced during this period. Climate fluctuations and changing vegetation impacted subsistence systems that relied on predictable food sources (Purtill 2009). In eastern Ohio, a reduction of sites and climatic shifts are less apparent, suggesting the Unglaciated Allegheny Plateaus might have provided a buffer from environmental changes occurring in the western parts of the state (Lepper 2005; Purtill 2009).

The warming and drying trend reached across most of the state by the beginning of the Late Archaic (6,000 B.P.), resulting in the expansion of oak-hickory forests. As resources became more reliable and bountiful, populations increased and became increasingly more sedentary (Griffin 1983; Meindl et al. 2001). Populations increased in the southeastern portions of the state as groups exploited nut trees, particularly along major river valleys (Purtill 2009). Reliable and predictable resources allowed for year-round or seasonal settlements based on regional subsistence strategies. In the south, the collection of fruit resources such as nuts, as well as fishing, hunting, and the horticulture of squash were important subsistence activities (Patton and Curran 2016). In the northern regions, especially in the lake plains, there is less reliance on the collection of nuts and a greater dependence on aquatic resources.

Regional and sub-regional differences within tool assemblages, such as varying hafted-biface types, and ceremonial artifacts styles, such as banner stones developed to suit regional needs and as sedentism increased. Early forms of agriculture were developed during the Late Archaic with planting of native plants such as squash, gourds, and sunflowers. Over the latter half of the Late Archaic, groups established large base camps and burial grounds (Purtill 2009). The use of burial grounds suggests a greater sense of collective identity and land ownership (Sciulli and Aument 1987; Abel et al. 2001). The most notable examples of Late Archaic burials in Ohio are the 500 burials at the Williams site on the Maumee River and the 380 Glacial Kame burials recorded at the Ridgeway site in Hardin County. Evidence from these and other Late Archaic burial grounds indicate that they held regional importance over hundreds of years (i.e., Williams site dates span from about 2,850 to 2,400 B.P.) (Lepper 2005).

3.1.3 Woodland Period (2,500 to 1,000 B.P.)

The Early Woodland Period (2,500 to 2,000 B.P.) is in many ways a continuity and development of Late Archaic traditions. Evidence of this is seen in radiocarbon dates showing continuing occupation at Late Archaic sites along with material evidence demonstrating ongoing cultural traditions that include plant domestication, ceramic technology, trade, and incipient mound construction (Lepper 2005; Purtill 2009). The Woodland groups grew several varieties of native plants (i.e., sunflowers, may grass, knotweed, goosefoot, and sump weed) that provided starch and oil-rich seeds (Abrams 2005). Squash and gourds also continued to be grown. The plants native to the Midwest were small and required a great amount of time and effort to process (Abrams 2005), therefore groups continued to rely on hunting and gathering of nearby resources such as white-tail deer, black bear, beaver, and wild turkey. In regions along Lake Erie,

Woodland populations relied heavily on aquatic resources such as fish, turtles, shellfish, and waterfowl (Lepper 2005). Typical characteristics of Early Woodland spear points include a broad blade with a rounded stem which would have been mounted to a wood or bone shaft (Justice 1995).

The Adena culture flourished during the Early Woodland Period in southern Ohio, and parts of Indiana, West Virginia, and Kentucky. They are recognized for their large earthen works and conical burial mounds. Adena mounds ranged from only a few feet tall to 70 feet tall and 240 feet in diameter and were likely used to bury prominent individuals such as warriors or political leaders (Lepper 2005). Mounds and earthen works are generally located nearly river valleys. There are documented mounds within Wood County along the Maumee River near its confluence with Lake Erie (Mills 1914; Lepper 2005).

The Hopewell culture of the Middle Woodland Period (2,100 to 1,500 B.P.) followed the Adena culture. Though subsistence strategies were similar to the Adena cultural, the Hopewell culture is differentiated by more elaborate burial practices, larger and more complicated earthen works, an expanded far-reaching trade network, advancement in stone tool and ceramic technology, and sophisticated artistic style (Lepper 2005). Large architectural works, such as High Banks Works in Ross County and Marietta Earthen works in Washington County in south and southeastern Ohio, respectively, extend up to a half a mile and encompassed structures and plazas used for living, social, and ceremonial use are expressions of the Hopewell culture in Ohio (Pederson 2005). Evidence of long-distance trade include obsidian and grizzly bear teeth from the Rocky Mountains, copper and silver from Canada, marine shells from the Gulf Coast, and shark teeth from the Atlantic (Lepper 2005).

The collapse of the Hopewell culture marked the beginning of the Late Woodland Period (1,500 to 1,100 B.P.). Trade diminished along with interregional mobility. Sub-regional groups developed with larger, more spread out villages that were often protected by barriers and deep ditches. Evidence of increased burials with projectile point trauma indicates villages were likely built to defend against attack. During the Late Woodland Period agriculture became increasing more intensive with the cultivation of maize, tobacco, squash, and gourds (Dancey 1992 and 2005). Reliance on hickory nuts, acorns, and black walnuts declined during this period as farming became more reliable (Lepper 2005). Hunting and gathering, however remained a primary way of subsistence in the regions along Lake Erie. Ceramics and stone tools were simpler and more efficient than those of the Middle Woodland. Pottery of the Late Woodland was grit tempered and thin walled with wide-mouthed jars that were typically decorated with vertical cord-markings (Lepper 2005). This construction allowed foods to be cooked at higher temperatures. Projectile points of the early Late Woodland Period were notched, stemmed spearpoints (Shott 1993). By 1200 B.P., the bow and arrow were introduced in Ohio (Justice 1995; Shott 1993; Morse and Morse 1990). Arrow points were triangular and formed from any chert available.

3.1.4 Late Prehistoric Period (1,100 to 400 B.P.)

The Late Prehistoric Period is marked by larger more sedentary villages and the increased cultivation of maize. As maize, along with beans and squash became principal crops, the diversity within the diet narrowed causing health problems such as arthritis, tuberculosis, yaws, and vitamin deficiency diseases. Late Prehistoric skeletal remains indicate chronic malnutrition caused from diet and possible crop failures from winter, floods, or drought (Lepper 2005). The placement of villages on high bluffs within stockades accompanied with evidence from burials suggest warfare occurred between communities (Hart 1993). Villages during this period were commonly constructed within concentric rings that were enclosed by wooden post stockades. Within the enclosures all village activity took place and included farms, houses, ceremonial areas, storage houses, trash pits, and burials. Villages, such as Sunwatch Village in Montgomery County had up to 250 inhabitants and was occupied for about 20 years before moving to another area (Yee 2005). Increased population pressures likely forced groups to move once soils were depleted and resources were used up (Lepper 2005).

Stone tool technology became more uniform with use of the bow and arrow. Common tools were hand axes for clearing and hoes for working the land. Ceramics were constructed with thinner walls than the those of Late Woodland Period and were tempered with shell temper and embellished with simple designs that varied regionally (Church and Nass 2002; Lepper 2005).

3.2 Historic Context

The end of Late Prehistoric Period is marked by the arrival of Europeans. A brief 100-year period of 'protohistory' includes the time after the Late Prehistoric Period and direct European contact. During this time items such as copper, brass, and glass beads brought by European explorers and traders were highly valued by native groups (Henderson 2005; Lepper 2005). Trade networks were established by eastern groups such as the Iroquois and Susquehannock who entered Ohio from the south and the north. Until Hernando de Soto's expedition of 1539-1543, native people of Ohio likely never met any Europeans (Henderson 2005), although lacking resistance to European diseases, up to 90 percent of the native population died from introduced diseases (Lepper 2005).

During the proto-historic period, the Black Swamp in northwestern Ohio was controlled by a coalition of tribes called the 'Assistaehronon' or Fire Nation Confederacy (Stothers and Schneider 2005). Demand for beaver, muskrat, mink, and otter fur for European clothing made the Black Swamp a valuable area for its fur resources (Stothers and Schneider 2005). The Iroquois Confederacy armed with European weapons moved to take control of the region along Lake Erie and the Black Swamp. In 1643, the Fire Nation was defeated and pushed west into Wisconsin where they became later known as Mascouten and Kickapoo (Stothers and Schneider 2005). Other native tribes in northern Ohio fled north, west, and south with the onslaught of the Iroquois Confederacy.

In the late 1660s, French explorers recorded Honniasontkeronons and Chiouanons, later known as Shawnee, living along the Ohio River and middle Ohio River Valley (Henderson 2005). At the time of Euro-American settlement in Ohio in the eighteenth century, Shawnee, Miami, and other central Algonquian groups lived in Ohio. As American settlers continued west, tensions with Native tribes grew, leading to violent skirmishes (Hurt 1998). The American Indian Alliance was formed under Little Turtle, chief of the Miami Nation, to protect land given to them in the Northwest Ordinance of 1785 which included the areas of Wisconsin, Michigan, Illinois, Indiana, Ohio, and portions of Minnesota. The Alliance included Tecumseh, Shawnee, Delaware, Wyandotte, Ottawa, and Ojibwa tribes. In 1794, the United States Army, led by General Anthony Wayne defeated the Indian Alliance at the Battle of Fallen Timbers, resulting in the 1795 Treaty of Greeneville (Hurt 1998). Signed by Myaamia, Wyandotte, Shawnee, Lenape, Ottawa, Ojibwa, Potawatomi, Kickapoo, Kaskaskias, Eel River, and Weas tribes, these tribes agreed to move to the northwestern territory of present-day Ohio.

During this time, the British continued to occupy areas along the Great Lakes defying the 1783 Treaty of Paris. British soldiers often provided aid to Native tribes to combat American settlers (Hurt 1998). In addition, Britain faced a shortage of sailors and would stop American ships and force hands to join their ships. In 1812, President James Madison signed a declaration to start the War of 1812. The war ended in December of 1814 with the signing of the Treaty of Ghent, and British support of Native Americans ended. With safer passage to settle lands in Ohio, increased numbers of pioneers and white settlers entered the area. In 1817, the Treaty of Maumee Rapids was signed by Wyandot, Seneca, Delaware, Shawnee, Potawatomi, Ottawa, and Chippewa tribes, renouncing their claim to four million acres of land in northwestern Ohio (Hurt 1998.

3.2.1 Local History

The first settler within what is today Amherst was Jacob Shupe in 1811, who built a log cabin next to Beaver Creek. Together with a carpenter, Shupe constructed the first sawmill in Lorain County. In 1819, a cabinetmaker from New Hampshire built a shop in the area and named the township after his former home Amherst. Lorain County would not be officially created until 1822. The towns early growth was largely due to the various quarries that were established there, and the sandstone they mined. The quarries resulted in a railroad being built through the town. Early settlers during this period were largely German and Swiss (City of Amherst 2021). By 2019, the city had grown to a population of 12,219 (United States Census Bureau 2021).

4.0 LITERATURE REVIEW

A literature and file review was performed to identify previously recorded historic properties listed on or considered eligible for listing on the National Register of Historic Places (NRHP) within 0.5 mile of the Project. Historic properties include architectural and archaeological resources, historic and cultural landscapes, and historic districts. The review also included primary historic records to assist POWER in identifying any previously unidentified cultural resources that may be present within the Project as well as any previously unidentified architectural resources greater than 50 years of age within 0.5 mile of the Project. Background research included review of the following sources:

- OHPO's Online Mapping System
- NRHP database
- Historic United States Geological Survey (USGS) topographical maps
    - Oberlin (USGS 1901) 15-Minute Quadrangle
    - Vermilion (USGS 1903) 15-Minute Quadrangle
    - Vermilion East (USGS 1932) 7.5-Minute Quadrangle
    - Lorain (USGS 1943) 7.5-Minute Quadrangle
    - Vermilion East (USGS 1959) 7.5-Minute Quadrangle
    - Lorain (USGS 1960) 7.5-Minute Quadrangle
    - Lorain (USGS 1969a) 7.5-Minute Quadrangle
    - Vermilion East (USGS 1969b) 7.5-Minute Quadrangle
- National Environment Title Research (NETR) Historic Aerials (NETR 2021)

Information from the literature review and background search was used to develop a cultural and historical context to place the Project and any identified historic resources within their appropriate context for evaluations of historical significance. This context was developed through review of previous cultural resource studies, historic maps, aerial photographs, local histories, and a variety of scholarly sources.

4.1 Previously Recorded Archaeological Resources

There are no previously recorded archaeological sites within 0.5 mile of the Project.

4.2 Previously Recorded Historic Architectural Resources

There are four previously recorded architectural resources within 0.5 mile of the Project. Three of the resources were recommended as ineligible by their original surveyors and one has not been assessed. Details of the individual resources can be found in Table 2 below. The closest resource (LOR0002917) is 0.33 mile away from the Project and will not be within view. None of the previously recorded resources will be directly or indirectly impacted by the Project.

TABLE 2 PREVIOUSLY RECORDED ARCHITECTURAL RESOURCES

SHPO ID	NAME	DATE	NRHP ELIGIBILITY	DISTANCE FROM PROJECT (MILES)	COMMENT
LOR0002917	Hickory Tree Grange	1879	Recommended Ineligible	0.33	Outside Project APE
LOR0003617	E. P. Streator House	1860	Recommended Ineligible	0.38	Outside Project APE
LOR0012117	G. W. Quigley House	1870	Recommended Ineligible	0.40	Outside Project APE
LOR0010517	Ezekiel Barnes Octagonal Barn	Pre-1874	Not Assessed	0.36	Outside Project APE

Notes: APE = Area of Potential Effect
Source: OHPO 2021.

4.3 Previously Recorded National Register of Historic Places Properties

There are no properties listed on the NRHP within 0.5 mile of the Project.

4.4 Previously Recorded Historical Cemeteries

There are two cemeteries (Onstine Cemetery [OGS 6966] and an unnamed cemetery) located within 0.5 mile of the Project. Both cemeteries are mapped near the intersection of Milan Avenue and Quarry Road, approximately 0.16 mile southwest of the Project. Topographic maps dating back to 1932 indicated a cemetery located at the northwest corner of the intersection of Milan Avenue and Quarry Road (USGS 1932; NETR 2021). After 1960 the cemetery is no longer depicted on the map. Neither cemetery was located during the current survey due their location on private property and the presence of dense ground cover.

4.5 Previous Cultural Resources Investigations

No previous archaeological or architecture investigations have been undertaken within 0.5 mile of the Project.

5.0 FIELD METHODOLOGY

5.1 Architectural Survey

On May 11 and 12, 2021, POWER conducted an architectural survey in an effort to identify and document buildings, objects, structures, sites, and districts within 0.5 mile of the Project that may have a view of the Project. Areas within 0.5 mile of the Project that have the potential to harbor resources that

meet the minimal 50-year-old threshold for consideration for the NRHP were determined by reviewing historic USGS maps, aerial photography, and property records. These areas were verified during field investigations. The architectural fieldwork for the Project was completed in accordance with OHPO's *Guidelines for Conducting History/Architecture Survey in Ohio* (OHPO 2014).

Field investigations consisted of a visual survey of the entire Project and within 0.5 mile of the Project from public roadways. Review of historic and present-day maps showed the architectural survey area consists of nearly level to rolling topography within a residential area broken up by stands of woods and open fields. The small historic community of Amherst located east of the Project and several historic homesteads located west and north of the Project date to at least the mid-eighteenth century. All field survey identification and documentation were conducted from public roads and included exterior features only. No interior inspections were conducted as part of this effort.

All areas within 0.5 mile of the Project that were previously determined to have the potential to harbor architectural resources 50 years of age or older were assessed for visibility of the Project, presence of potentially significant architectural resources, and where applicable, the recommended NRHP eligibility of potentially significant resources.

For each newly identified resource, the information collected included a physical description of the resource, descriptions of its relationship to adjacent buildings and structures, general condition, surrounding setting, description of exterior materials, identifiable architectural or structural treatments, and retention of historic physical integrity. Global Positioning System (GPS) location and photo-documentation were recorded with the Esri ArcGIS Field Maps application. Representative photographs were taken to document each property's existing conditions, setting, and secondary resources, if applicable.

Construction dates for resources were established through a combination of archival research, property records search, map analysis, and field inspection. Each newly recorded resource identified during the survey was included on a survey form and assigned an inventory number. All buildings and structures recorded as part of this study were documented in accordance with OHPO's standards and guidelines and evaluated to determine potential significance in accordance with NRHP criteria.

5.1.1 Eligibility Determinations

Above-ground resources within the architectural survey area were evaluated to determine their eligibility for listing in the NRHP based on their integrity and their ability to meet one or more NRHP criteria for evaluation. These criteria state that a property may be considered significant if it is:

A) Associated with events that have made a contribution to broad patterns of history;

B) Associated with the lives of persons significant in our past;

C) Embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, possesses high artistic values, or represents a significant or distinguishable entity whose components may lack individual distinction; and

D) Has yielded, or may yield, information important in prehistory or history.

An above-ground resource needs to meet at least one of the above NRHP criteria to be considered eligible for listing in the NRHP.

A property must also retain sufficient integrity to be considered eligible for the NRHP. According to the NRHP, "integrity is the ability of a property to convey its significance." There are seven attributes of integrity: location, design, setting, materials, workmanship, feeling and association (National Park Service

1995). Each resource was evaluated to determine whether or not it retained all or some of these aspects. Several aspects of each resource were examined to determine whether it retained integrity. Issues affecting integrity included, but were not limited to:

- The presence of replacement aluminum or vinyl siding over original wood siding.
- Replacement windows, and/or doors.
- Removal of porches; the alteration or replacement of porches.
- Changes in fenestration.
- The presence of additions.
- Changes in massing.
- Removal of historic period trim and ornamentation.

Alterations to integrity of setting included relocation of a building from its original site, the loss of early outbuildings, the presence of new (post-1971) outbuildings, and proximity of modern development, such as newer commercial buildings and/or recent housing developments.

5.2 Archaeological Survey

On May 11 and 12, 2021, POWER conducted a Phase I archaeological survey for the Project. The Area of Potential Effect (APE) encompasses the entire 16.0-acre Project area. Approximately 7.4-acres on the western portion of the Project and the 1.7-acre portion of the Project on City of Amherst owned property on the eastern end of the Project were only visually inspected due to prior disturbance caused by quarrying activities, shallow bedrock, underground utility lines, inundation, underdrainages, and a stormwater basin. In addition, an area encompassing 1.0-acre along the southeastern portion of the proposed transmission line right-of-way (ROW) was visually inspected due to a new housing development. Only the remaining 5.38 acres located at the eastern and southeastern portions of the Project were shovel tested for archaeological resources.

The archaeological fieldwork for the Project was completed in accordance with Section 106 of the National Historic Preservation Act of 1966 as amended (54 United States Code §306108: 36 C.F.R. 800), and in accordance with OHPO's *Archaeology Guidelines* (1994) for systematic surface inspection and shovel testing. The archaeological survey aimed to identify cultural resources that may be impacted by the Project. The survey primarily consisted of systematic pedestrian surface reconnaissance within quarried and inundated area, and in areas having 50 percent or more surface visibility. The surface inspection was conducted along transects spaced at 10-meter intervals.

Shovel tests were excavated in areas that had less than 50 percent surface visibility and to confirm the presence/absence of previous disturbance and in areas that tend to be associated with archaeological site locations, such as level, well drained terrain. Shovel testing was not conducted within inundated areas or visible surface disturbance. The soil excavated from all shovel tests was passed through a 0.25-inch mesh screen in 10-centimeter level. All shovel tests were approximately 50 centimeters in diameter and excavated to sterile subsoil or bedrock, or in the case of deep soil profiles, to at least 50 centimeters below surface. In cases where positive shovel tests were encountered, radial shovel testing was conducted to determine the horizontal and vertical extent of the site area. The interval between radial shovel tests typically was 5 to 10 meters. Data was collected with the ArcGIS Field Maps App on an iPhone XS. Appendix A: Figures 2 – 4 show the locations of all shovel tests and Appendix C provides a detailed shovel test log.

5.3 Laboratory Analysis

No artifacts requiring laboratory analysis or curation were produced as a result of the Phase I archaeological survey.

5.4 Report and Record Preparation

Information from field survey was used in conjunction with background research and context development to assess each identified cultural resource for potential NRHP-eligibility. A results section was prepared that summarizes the field findings, assessment of significance and NRHP-eligibility, and recommendations for further study. The results of the study are accompanied by maps and photographs as appropriate and were synthesized and summarized in this report along with the research design, archives search, and cultural contexts. All research material and documentation generated by this Project are on file at POWER's office in Cincinnati, Ohio.

6.0 ARCHITECTURAL SURVEY RESULTS

The architectural survey area included the entire Project area and buildings, objects, structures, sites, and districts that were 0.5 mile from and within view of the Project. The architectural APE, comprised of the Project area and an area within view of Project components, was established through photo-documented field observations (Appendix D: Photos 41 – 49). All buildings, objects, structures, and sites 50 years of age or older were surveyed. A total of four newly identified architectural resources constructed before 1971 were recorded (Appendix A: Figures 2 and 3). The newly identified architectural resources are residences that date from the early nineteenth to mid-twentieth century (Table 3). Resources B-01 and B- 02 are recommended as ineligible for listing on the NRHP. Resources B-03 and B-04 could not be adequately assessed due to lack of visibility from public ROW, however, POWER recommends that neither of the unassessed resources will be negatively impacted by the Project. Detailed reviews of the four newly recorded resources can be found below. Photos of the resources can be found in Appendix D. Construction dates and other details were retrieved from county records (Lorain County Auditor 2021).

TABLE 3 NEWLY RECORDED HISTORIC ARCHITECTURAL RESOURCES

FIELD ID	RESOURCE TYPE	ADDRESS	DATE	NRHP RECOMMENDATION
B-01	Residence	1165 Milan Avenue, Amherst, OH 44001	1963	Not Eligible
B-02	Residence	287 Crosse Road, Amherst, OH 44001	1964	Not Eligible
B-03	Residence	295 Crosse Road, Amherst, OH 44001	1958	Not Assessed
B-04	Residence	976 West Martin Avenue, Amherst, OH 4401	1830 and 1900	Not Assessed

6.1 Resource B-01

Resource B-01 is a single-story ranch-style residence that was built in 1963. It has a side gable with asphalt shingles and a centrally located brick chimney. The house has been sided in vinyl. The residence features a double-door entrance, a bay window, and a picture window flanked by four-over-four windows. The rest of the windows are single-hung one-over-one widows with fixed shudders. The windows are

vinyl replacements of what were likely originally aluminum fixtures and the structure was likely resided since its construction (Appendix D: Photos 50 – 54).

There are no indications that Resource B-01 is associated with any events or persons important to our collective history. POWER recommends the resource is not eligible for the NRHP under Criterion A or B. Resource B-01 is not a unique example of the ranch style and has not maintained its integrity of materials. POWER therefore recommends that the resource is not eligible for the NRHP under Criterion C. Due to its lack of eligibility, POWER recommends that no additional cultural survey is necessary for the Project to proceed near Resource B-01.

6.2 Resource B-02

Resource B-02 is a 1.5 story vernacular residence built in 1964. The structure features a side gabled, asphalt shingle roof with a clay pot chimney and two front facing dormer with fixed shudders. The structures siding is a combination of wooden slats and faux cut stone. The front of Resource B-01 features a side facing entrance with covered porch, a large bay window. The rest of the windows include six-over-six single-hung sashes. The bay window may be original, but the other windows appear to have been replaced since original construction. The faux-stone siding is also likely an alteration (Appendix D: Photos 47 and 55 – 57).

There are no indications that Resource B-02 is associated with any events or persons important to our collective history. POWER recommends the resource is not eligible for the NRHP under Criterion A or B. Resource B-02 is not a unique example of an architectural style and has not maintained its integrity of materials. POWER therefore recommends that the resource is not eligible for the NRHP under Criterion C. Due to its lack of eligibility, POWER recommends that no additional cultural survey is necessary for the Project to proceed near Resource B-02.

6.3 Resource B-03

Resource B-03 is a single-story residence built in 1958 with a hipped roof. View of the structure is largely blocked from the public right-of-way by a line of trees (Appendix D: Photo 46). A review of historic aerials (NETR Online 2021) and USGS topographic maps indicates that Resource B-03 replaced an existing structure that was present as far back as 1952.

Due to the lack of visibility from public ROW, an informed NRHP recommendation cannot be made based on the current survey. Resource B-03 will only have a view of the Project via an existing transmission line corridor that is not part of the current Project (Appendix D: Photo 47). An unrelated transmission line is already a prominent part of the resource's viewshed, therefore POWER recommends that the Project will present only a nominal change in the resource's setting and will not negatively impact it. POWER recommends that no additional cultural survey is necessary for the Project to proceed near Resource B-03.

6.4 Resource B-04

Resource B-04 consists of two (B-04a and B-04b) single story vernacular residences built in 1830 and 1900. The resource is not visible from public ROW, but it is partially visible from the Project area to the south (Appendix D: Photos 58 and 59). A single photo of Resource B-04a was obtained from the Lorain County Auditor (Appendix D: Photo 60). The photo does not have a date so its current condition may differ. Resource B-04a is a single-story vernacular residence with vinyl siding and aluminum windows. It has a side-gabled roof with asphalt shingles, and a covered porch. It has an attached garage on its northern side. No additional information could be obtained concerning Resource B-04b.

Due to the lack of visibility, an informed NRHP recommendation cannot be made based on the current survey. An unrelated transmission line and the existing Amherst #2 Substation is already a prominent part of the resource's viewshed, therefore POWER recommends that the Project will present only a nominal change in the resource's setting and will not negatively impact it. POWER recommends that no additional cultural survey is necessary for the Project to proceed near Resource B-04.

7.0 ARCHAEOLOGICAL SURVEY RESULTS

On May 11 and 12, 2021, POWER archaeologist Jahleen Sefton traversed the Project area and thoroughly inspected the ground surface for cultural resources. The Project area is situated on a level to nearly level mostly wooded tract that rises gently to the south (Appendix A: Figures 1 – 4). The Project runs generally east to west along a NS Chicago Line MT-1 railroad ROW.

The entire western portion of the Project had been extensively quarried from the 1960s to 1990s. Scars from quarrying are apparent by deep cuts into the bedrock and stacked and piled boulders (Appendix D: Photos 1 – 10). The western portion of the Project area is now a homestead occupied by several structures, servicing utility lines, and a septic line that run along the proposed ROW (Appendix D: Photos 4, 6 and 7). No shovel tests were excavated in the western portion of Project due to shallow bedrock and disturbance caused by mining activities and utility lines.

The eastern portion of the Project is covered in mature deciduous woods. Leaf litter and fallen limbs provided poor ground surface visibility (less than 50 percent) except within low lying areas and dirt roads (Appendix D: Photos 13 – 23). Modern trash such as cement pipes, brick, and metal debris near LS01 and LS05 are likely affiliated with the development south of the Project area (Appendix D: Photos 13 – 17, and 21). A new house is currently being constructed south of the LS08 and LS09 (Appendix D: Photo 24).

Much of the eastern and southeastern portion of the Project area is saturated or inundated with low standing water (Appendix D: Photos 18, 26, and 28). Several underdrainages flow water into a large, deep stormwater basin located west of the existing Amherst #2 Substation (Appendix D: Photos 30 – 32, and 38 to 40). The aerials of the survey area indicated the stormwater basin was constructed sometime between 2006 and 2010 (NETR 2021). Aerials also indicated a gravel road running from Milan Road, north along the existing transmission line to the substation as well as to a bridge that led to the houses (Resource B-04) north of the railroad tracks. All roads on the property including the bridge are no longer present (Appendix D: Photos 27, 29, 33, and 34). This area which includes the stormwater basin and the existing substation is owned by City of Amherst (see Appendix B: OHC: Archaeological Survey Permit). Due to the stormwater basin and standing water the area was only pedestrian surveyed. No shovel tests were excavated on City of Amherst property.

A total of 26 shovel tests were excavated to an average depth of 56 centimeters below surface in the eastern and southeastern portions of the Project (Appendix A: Figures 2 – 4; Appendix C: Shovel Test Log), none of which were positive for cultural materials. Soils generally consisted of dark grayish brown sandy loam underlain by yellowish-brown to brown sand, then by a gravelly yellowish-brown sand with reddish-brown mottled subsoil. Within low lying areas, soils generally consisted of dark grayish brown loam with strong brown mottles, underlain by gray loam with strong brown mottles. Most of the shovel tests in the lower A-horizon hit a shallow water table with water pooling at the top of the B-horizon. No cultural materials were identified during the survey.

8.0 CONCLUSIONS AND RECOMMENDATIONS

On May 11 and 12, 2021, POWER conducted a Phase I Cultural Resources Survey for the proposed Amherst #2 Substation Expansion and 138 kV Transmission Line Project in Lorain County, Ohio. The investigation was undertaken in support of the LON Application to the OPSB, a state agency of Ohio. The Project entails the expansion of the Amherst #2 Substation and construction of a 0.4-mile 138 kV transmission line. The Project is located north of the intersection of Milan Avenue and Apple Orchard Lane in the City of Amherst. The Project encompasses 16.0 acres, of which 1.7 acres are on City of Amherst property. The existing Amherst #2 Substation is on City of Amherst owned property.

A file review was undertaken using the Ohio Online Mapping System prior to fieldwork to identify cultural resources recorded within 0.5 mile of the Project. There are four previously recorded historic architectural resources (LOR0012117, LOR0003617, LOR0010517, and LOR0002917) and one cemetery (OGSID 6966) within 0.5 mile of the Project, none of which are recommended as eligible for the NRHP nor are within the Project APE. None of the previously recorded resources will be directly or indirectly impacted by the Project.

The APE for historic and prehistoric archaeological resources was limited to the areas of direct ground disturbance from the Project. The archaeological APE encompasses the entire 16.0-acre Project area. Approximately 7.4 acres on the western portion of the Project and the 1.7-acre portion of the Project on City of Amherst owned property on the eastern end of the Project were only visually inspected due to prior disturbance caused by quarrying activities, shallow bedrock, underground utility lines, inundation, underdrainages, and a stormwater basin. In addition, an area encompassing 1.0 acre along the southeastern portion of the proposed transmission line ROW was visually inspected due to the presence of a new housing development. Only the remaining 5.38 acres located at the eastern and southeastern portions of the Project were shovel tested for archaeological resources, which included the excavation of 26 shovel tests. Approximately 20 percent of the Project area had sufficient (greater than 50 percent) ground surface visibility to perform a visual survey only. No archaeological sites were identified as a result of the survey.

The architectural APE is defined as the area within both 0.5 mile and in view of the Project. Impacts on resources can either be direct, physical alterations to the resource itself, or indirect, an alteration to the setting of the resource. Four newly documented architectural resources (B-01, B-02, B-03, B-04) constructed before 1971 were identified within view of the Project. Two of the newly recorded historic architectural resources are not recommended as contributing or eligible for the NRHP due to changes or alterations, and/or lack of defined style, and two of the newly recorded architectural resources were not assessed due to lack of access. Due to existing, unrelated transmission lines already a part of the view shed, none of the resources will be negatively impacted. None of the newly recorded architectural resources will be directly impacted by the Project.

Based on the results of the Phase I cultural resources survey, no potentially significant cultural resources would be affected by the proposed undertaking. In accordance with 38 C.F.R. 800.4, POWER on behalf of AMPT has made a reasonable and good-faith effort to identify historic properties within the potential disturbance area of the Project. POWER recommends that the Project will have no effect on known historic properties and no further work is recommended in connection with the proposed undertaking.

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APPENDIX A MAPS

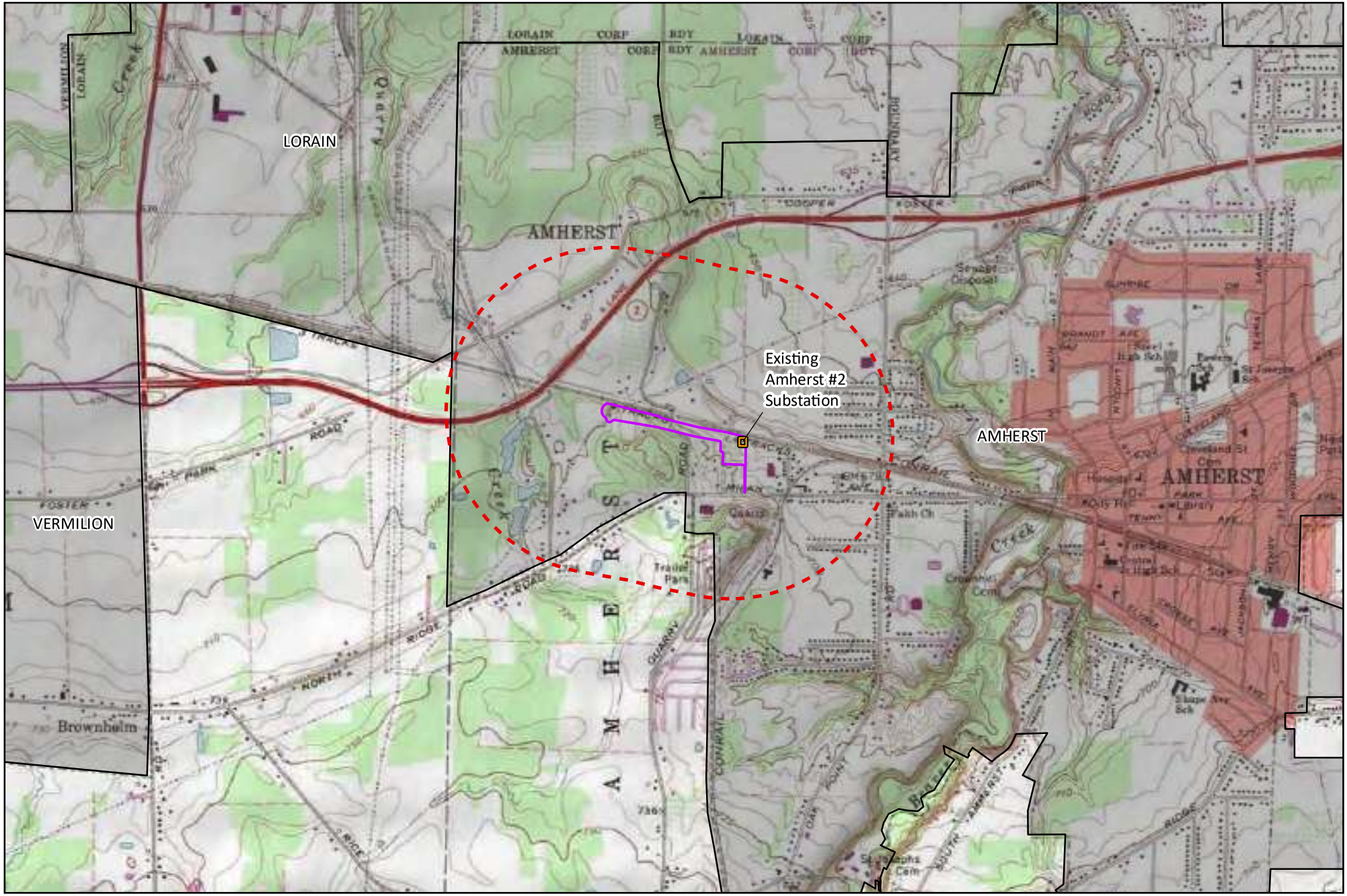


Figure 01:
Project Vicinity
Lorain County, Ohio

0 1,000 2,000
Feet

1" = 2,000'

Map 1 of 1

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS
AMP TRANSMISSION

Date: 6/17/2021; Author: jhumiston; Project: 167911

- Existing Substation
- Survey Area
- 0.5-mile Buffer
- Shovel Test - Negative
- Newly Recorded Architectural Resources
- Previously Recorded Architectural Resources
- OGS Cemetery
- Cemetery
- Road
- Reservoir
- City of Amherst Owned Parcels
- New House

Figure 02: Project Area
Lorain County, Ohio
Aerial Imagery flown: April 2019

0 1,000
Feet
1" = 750'
Map 1 of 1

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS
AMP TRANSMISSION

Date: 6/17/2021; Author: jhumiston; Project: 167911

- Existing Substation
- Survey Area
- 0.5-mile Buffer
- Shovel Test - Negative
- Newly Recorded Architectural Resources
- Previously Recorded Architectural Resources
- OGS Cemetery
- Cemetery
- Reservoir
- Road
- City of Amherst Owned Parcels
- New House
- USGS Topo Quadrangle Boundary

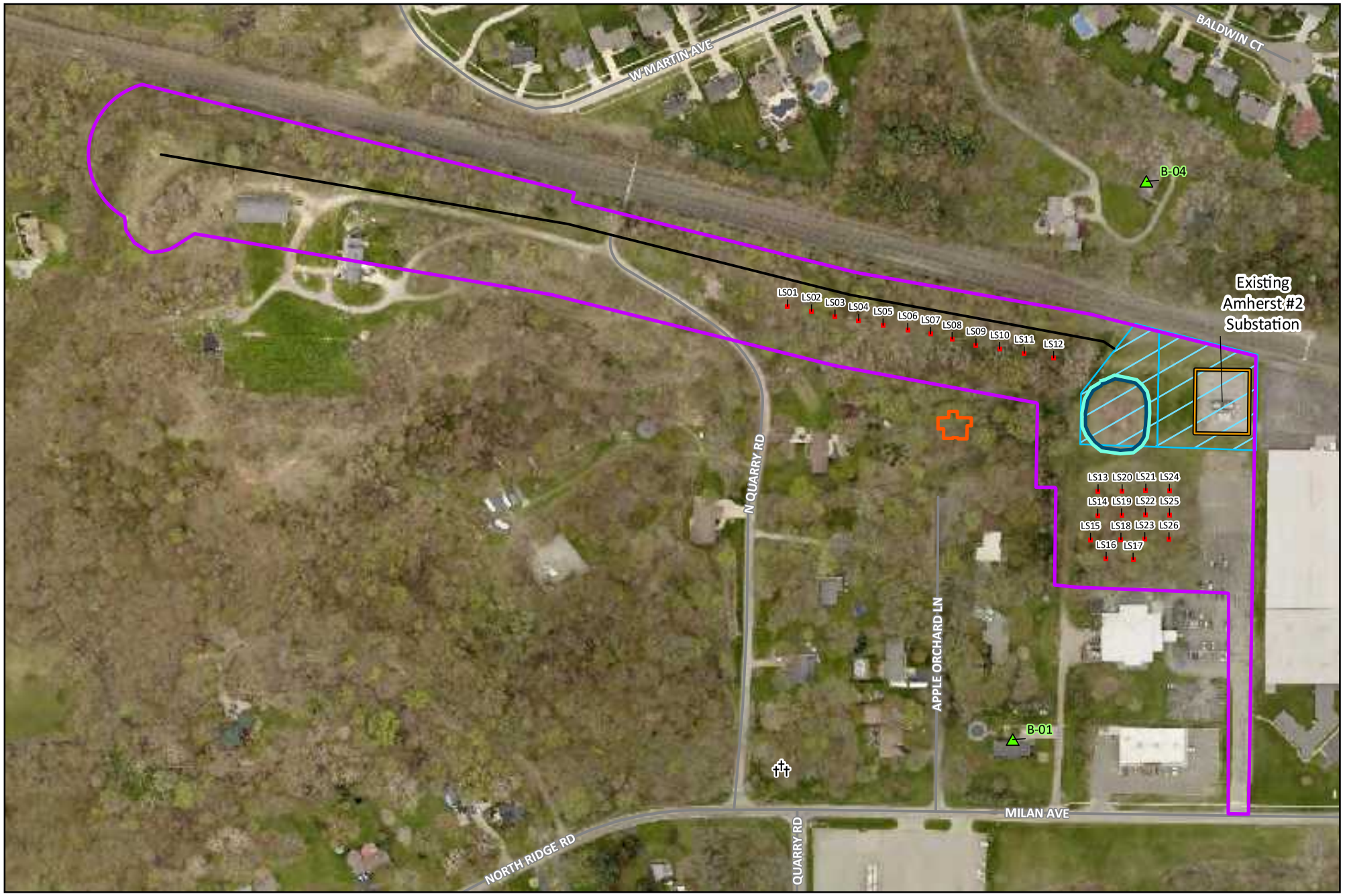
Figure 03: Project Area
Lorain County, Ohio
USGS Topo Quad: Vermilion East and Lorain (5/12/2021)

0 1,000
Feet
1" = 750'
Map 1 of 1

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS
AMP TRANSMISSION

Date: 6/17/2021; Author: jhumiston; Project: 167911



- Proposed Route
- Existing Substation
- Cemetery
- Reservoir
- Shovel Test - Negative
- Newly Recorded Architectural Resources
- 0.5-mile Buffer
- New House
- Survey Area
- City of Amherst Owned Parcels
- Road

Figure 04: Project Area
Lorain County, Ohio
Aerial Imagery flown: April 2019

0 250
Feet

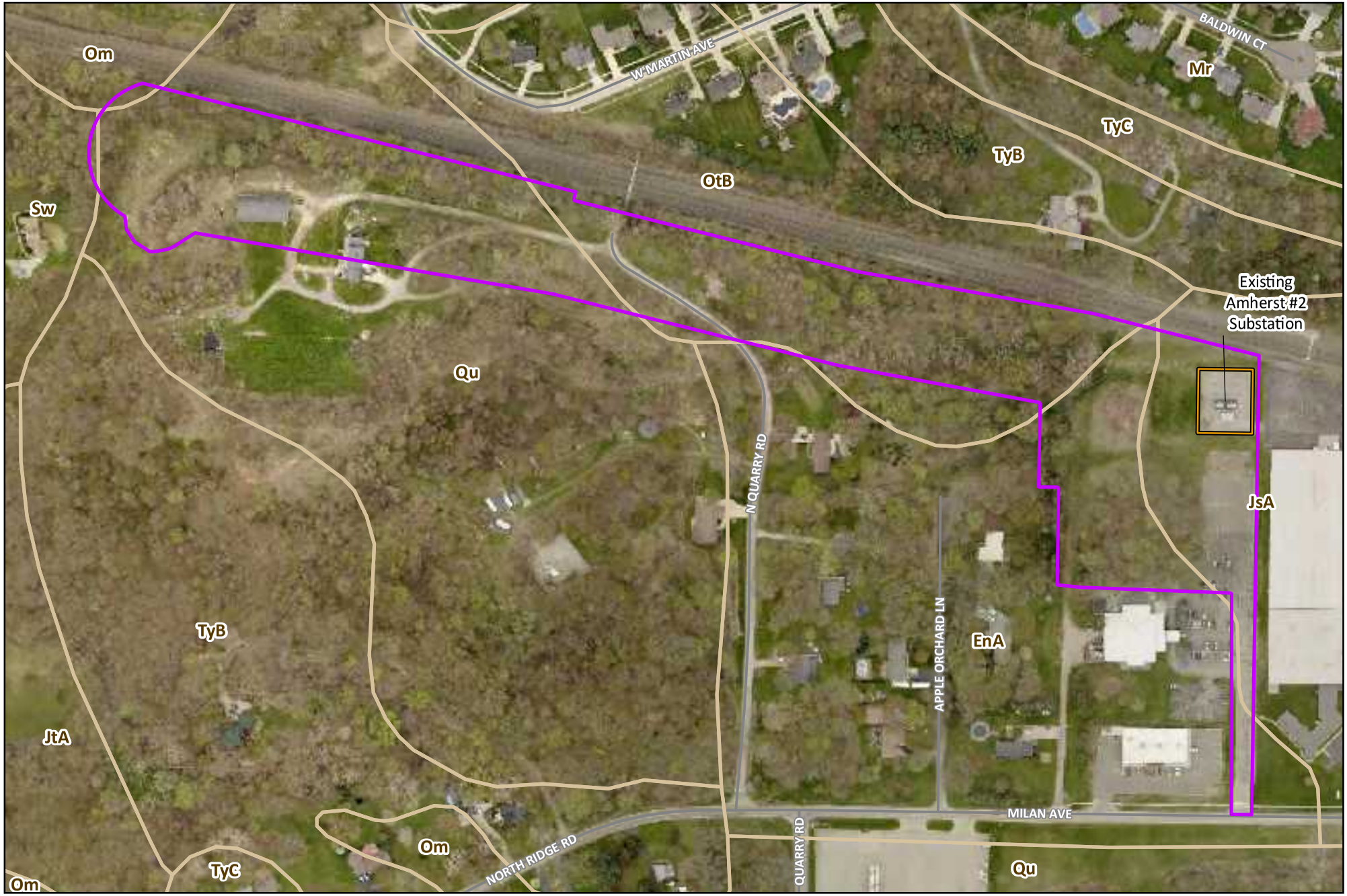
1" = 250'

Map 1 of 1

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS
AMP TRANSMISSION

Date: 6/17/2021; Author: jhumiston; Project: 167911



Soils Boundary
Survey Area
Existing Substation
Road

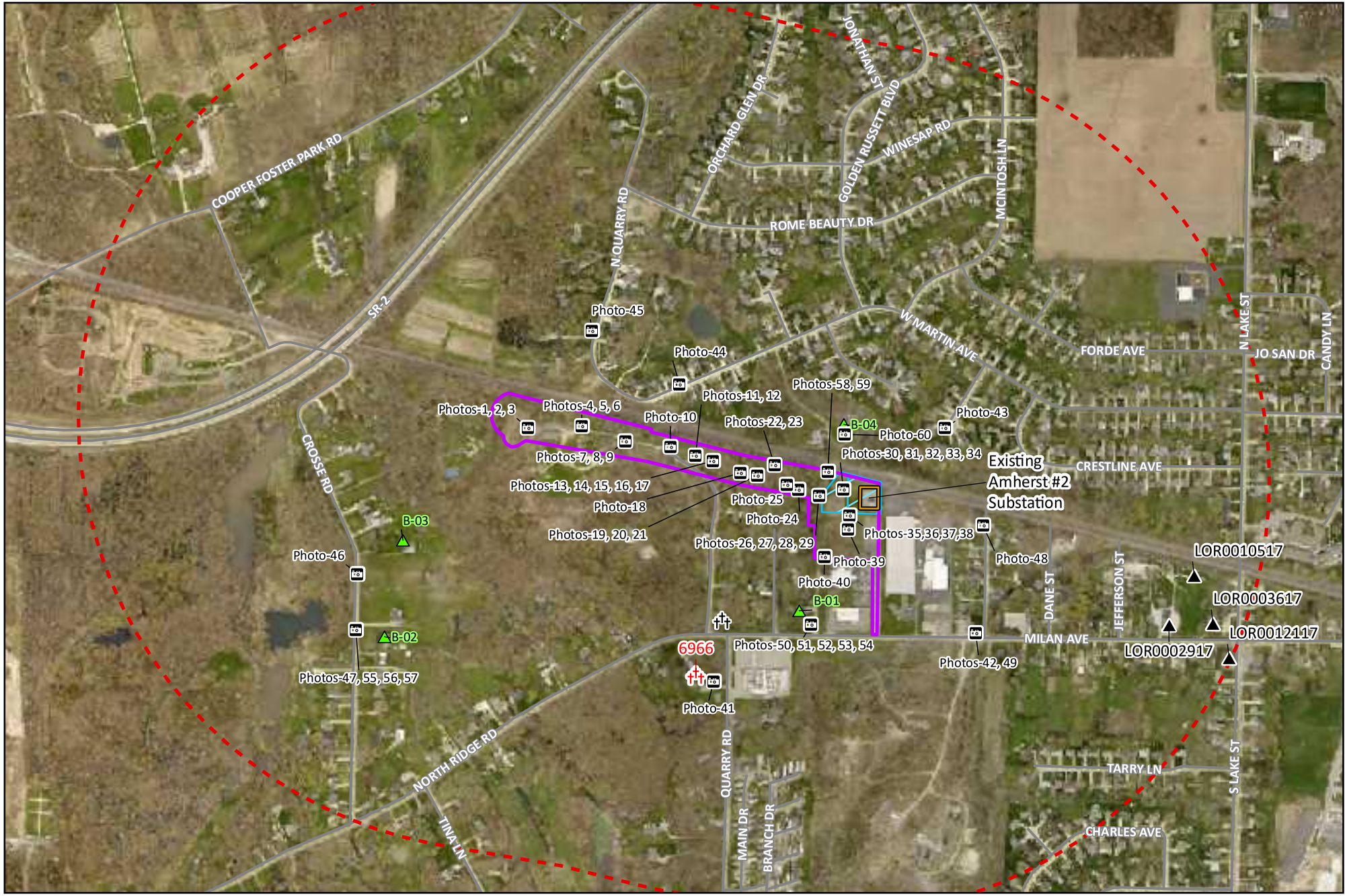
Figure 05:
Project Area Soils
Lorain County, Ohio

0 250
Feet
1" = 250'
Map 1 of 1

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS
AMP TRANSMISSION

Date: 6/17/2021; Author: jhumiston; Project: 167911



- Existing Substation
- Survey Area
- 0.5-mile Buffer
- Photo
- Newly Recorded Architectural Resources
- Previously Recorded Architectural Resources
- OGS Cemetery
- Cemetery
- City of Amherst Owned Parcels
- Road

Figure 06:
Photo Key Map
Lorain County, Ohio

0 250 500 750 1,000
Feet

1" = 750'

Map 1 of 1

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS
AMP TRANSMISSION

Date: 6/17/2021; Author: jhumiston; Project: 167911

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APPENDIX B OHC ARCHAEOLOGICAL SURVEY PERMIT

Permit Number _____
Non OHS Site

OHIO HISTORY CONNECTION: ARCHAEOLOGICAL SURVEY/EXCAVATION PERMIT

Under the authority of Section 149.54 of the Ohio revised Code Jahleen E. Sefton is hereby granted permission by the Director of Ohio History Connection to engage in archaeological survey and/or excavation at the referenced locations in accordance with the conditions outlined in this document.

Dates of fieldwork: May 11th and 12th, 2021

Location of Survey: Northeast of intersection of Milan Avenue and Apple Orchard Lane, Amherst, Ohio (parcel ID #s 0500003106018 and 0500003106020 (Maps attached)

Site to be Excavated: None

Applicant's Address: POWER Engineers, Inc., 11733 Chesterdale Road, Cincinnati, Ohio 45223

Applicant's Telephone Number: (214) 403-8539

Institutional Affiliation (if different from above address): _____

Applicant's OAC Certification Level (If not applicable – attach brief PI resume): Levels 1-5

If not certified, attach a copy of the principal investigator's resume.

It is agreed that the archaeological investigation subject to this permit will be performed in accordance with the purposes and methods described in the attached proposal and in accordance with the following conditions:

1) The applicant and crew members will exercise due precautions to minimize hazard to the public by backfilling units when excavations are complete and by generally maintaining safe working conditions.

2) This agreement will not be construed as creating an employment relationship between Ohio History Connection and Jahleen E. Sefton or any other persons participating in this project, it being understood that by executing this agreement Ohio History Connection is granting a mere license to enter upon the site for the purposes stated. As consideration for this license Jahleen E. Sefton releases Ohio History Connection from any claim which may arise for personal injury or property damage by reason of their entry upon the premises and agree to procure a similar release from any person assisting in this project. Jahleen E. Sefton shall hold Ohio History Connection harmless from any liability, claim, or expense arising out of the activity authorized by this agreement.

3) Ohio History Connection has the right to terminate this agreement under the provisions of Section E (3), 149-1-02 Guidelines for Archaeological Investigations on Public Land, Archaeological Preserves, and Sites Listed in the State Registry of Archaeological Landmarks.

4) The excavations will be open for site inspections by Ohio History Connection personnel at a mutually agreed upon time at least once during the field phase of the project. *(N/A* - Phase I Reconnaissance)

5) The applicant will notify the Ohio History Connection in writing at the end of the excavation, briefly describing the results of the work. A preliminary written report indicating the results of the investigation, the cultural material recovered, and the specific areas excavated will be filed with Ohio History Connection by Jahleen E. Sefton within 1 year of the execution of this permit. A final written report meeting the "Archaeology Guidelines" will be submitted to Ohio History Connection by Jahleen E. Sefton within 2 years of the execution of this permit.

6) All official notes, records, photographs, and maps for work carried out under the terms of this permit are to be curated for further study at the Ohio History Connection and copies of the same will be filed with the Ohio History Connection by Jahleen E. Sefton within 3 years of the execution of this permit.

7) Cultural material recovered during investigations under this permit shall remain the property of the State of Ohio. The Director of Ohio History Connection has the authority to determine the final disposition of artifacts and skeletal remains recovered from state lands. Cultural materials are to be processed and catalogued by the applicant in accordance with a system acceptable to Ohio History Connection. They are to be curated at Ohio History Connection within 3 years of the execution of this permit.

   All collections and records made under the provisions of this permit must be made available for scholarly study and public education without charge upon reasonable notice.

   The permittee does not have the right to dispose of collections curated under the provisions of this permit. The permittee must obtain prior written consent from the Director for Ohio History Connection before making loans of said collections to any other institutions or individual.

   In the event that the institution housing collections subject to this permit is dissolved, for whatever reason, the collections and records will revert to the custody of Ohio History Connection.

8) Site locations will be disclosed only to persons having legitimate reasons for obtaining such information, such as research projects or environmental impact studies.

Jahleen E. Sefton	
Name of Applicant	Lox A. Logan, Jr. State Historic Preservation Officer
May 5, 2021	5/13/2021
Date	Date

Project Description:

On May 11th and 12th, 2021, POWER Engineers, Inc. will conduct a Phase I Cultural Resources Survey for the AMP Transmission, LLC's (AMPT) proposed Amherst #2 Substation Expansion and 138 kilovolt (kV) Transmission Line Project (Project) in Lorain County, Ohio. The Project entails the expansion of the Amherst #2 Substation and a 0.4-mile 138 kV double-circuit transmission line. The Project is located north of the intersection of Milan Avenue and Apple Orchard Lane in the City of Amherst. Including workspace, the Project encompasses 15.5 acres, of which 1.72 acres are on City of Amherst property (parcel ID numbers 0500003106018 and 0500003106020). The existing Amherst #2 Substation is on City of Amherst owned property.

The proposed undertaking requires completion of the Letter of Notification (LON) Application to the Ohio Power Siting Board (OPSB), a state agency of Ohio; as such, the Project falls under jurisdiction of the Ohio Administrative Code 4906-6. At this time, no federal permits, licenses, or funds have been identified for the project. The Project will require a OPSB LON, under the Ohio Revised Code 149.53, therefore, AMPT is required to provide the Ohio Historic Preservation Office (OHPO) with an opportunity to review and comment on the project's potential to adversely affect significant historic properties located within the potential disturbance area of the Project. The Phase I archaeological and architectural survey methodology and report format and design will follow the OHPO's *Archaeology Guidelines* (OHPO 1994) and *Guidelines for Conducting History/Architecture Survey in Ohio* (OHPO 2014).

The Phase I archaeological survey will be conducted to identify and evaluate historic properties and to determine the effect from the Project, if any, on those properties. For the purposes of this survey, the Area of Potential Effect (APE) (direct effects to historic and prehistoric archaeological resources) is limited to the area of potential ground disturbance based on the preliminary design of the Project and includes the proposed substation expansion and new right-of-way (ROW) (see Survey Area Map). The APE encompasses the entire 15.5-acre Project area. The Phase I survey area for historic architectural resources include the APE and an area extending up-to 0.5 mile from the Project boundary.

A file review was undertaken using the Ohio Online Mapping System to identify cultural resources recorded within 0.5 mile of the Project. There are four previously recorded historic architectural resources (LOR0012117, LOR0003617, LOR0010517, and LOR0002917) and one cemetery (OGSED 6966) within 0.5 mile of the Project, none of which are recommended as eligible for the National Register of Historic Properties (NRHP). No previously recorded archaeological sites or historic properties are within 0.5 miles of the Project.

The research to be summarized in the Phase I Cultural Resources Survey Report will be performed by Principal Investigator Jahleen E. Sefton, M.A, RPA and Tanner Haynes, MA, RPA. Fieldwork will be conducted by Jahleen Sefton on May 11th and 12th, 2021. Both Jahleen Sefton and Tanner Haynes meet the Secretary of the Interior's *Professional Qualifications Standards for Archeology and Historic Preservation* (48 Federal Register 22716 or 36 Code of Federal Regulations [CFR] Part 61).

Mapping:

See Attachment - Amherst 2 Survey Area Map

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APPENDIX C SHOVEL TEST LOG

SHOVEL TEST NO	STRATUM	DEPTH (CM)	MUNSELL	TEXTURE	COMPACTION	INCLUSIONS	COMMENTS
LS01	I	25	Dark grayish brown	Sandy loam	L	Many roots	-
LS01	II	40	Yellowish brown	Sandy loam	M	Common gravels and small cobbles	-
LS01	III	70	Brown to reddish brown	Coarse sand	M	Many small gravels and cobbles	Subsoil
LS02	I	30	Dark grayish brown	Sandy loam	L	Many roots	-
LS02	II	45	Yellowish brown	Course sandy loam	M	Many gravels and small cobbles	-
LS02	III	55	Hydric yellowish brown with reddish brown mottles	Coarse sandy loam	M	Sandstone concretions	Water table at 50 cmbs
LS03	I	10	Very dark grayish brown	Hydric sandy loam	L	-	Water table at surface
LS04	I	20	Dark grayish brown	Sandy loam	L	Many roots	-
LS04	II	55	Yellowish brown	Coarse sandy loam	M	Common gravels and small cobbles	-
LS04	III	65	Hydric yellowish brown with reddish brown mottles	Coarse sandy loam	M	Common hematitic sandstone nodules and gravels	Water table at 60 cmbs
LS05	I	35	Dark grayish brown	Sandy loam	L	Many roots	-
LS05	II	70	Yellowish brown	Sandy loam	H	Many hematitic sandstone nodules and small gravels	Subsoil
LS06	I	40	Dark grayish brown	Sandy loam	L	Many roots	-
LS06	II	70	Yellowish brown	Sandy loam	H	Many hematitic sandstone nodules and small gravels	Subsoil
LS07	I	35	Dark grayish brown	Sandy loam	L	Many roots	-
LS07	II	50	Yellowish brown with few reddish brown mottles	Sandy loam	H	Few gravels	Water table at 40 cmbs
LS08	I	25	Dark grayish brown	Sandy loam	-	-	Water table at bottom of strat
LS08	II	50	Yellowish brown with reddish brown mottles	Sandy loam	H	Few gravels increasing with depth	Very hard soils, water table at 25cmbs
LS09	I	15	Dark grayish brown	Sandy loam	L	Many roots	-
LS09	II	60	Yellowish brown with reddish brown mottles	Coarse sandy loam	M	Few gravels increasing with depth	Water table at 50 cmbs
LS10	I	15	Dark grayish brown	Sandy loam	L	Many roots	Water table at 30 cmbs
LS10	II	60	Yellowish brown with reddish brown mottles	Coarse sandy loam	M	Few gravels increasing with depth	Subsoil
LS11	I	30	Dark grayish brown	Sandy loam	L	Many roots	-
LS11	II	40	Yellowish brown	Hard sandy loam	H	Few gravels	-
LS11	III	70	Yellowish brown with reddish brown mottles	Hard sandy loam	H	Few gravels and common sandstone nodules	Hard pan
LS12	I	30	Dark grayish brown	Sandy loam	L	Many roots	-
LS12	II	40	Yellowish brown	Hard sandy loam	H	Few gravels	-
LS12	III	70	Yellowish brown with reddish brown mottles	Hard sandy loam	H	Few gravels and common sandstone nodules	Hard pan
LS13	I	30	Dark grayish brown	Sandy loam	L	Many roots	-
LS13	II	40	Yellowish brown	Fine sand	H	Few iron masses and sandstone concretions	-
LS13	III	70	Brown	Fine sand	H	Many iron masses and sandstone concretions	Subsoil
LS14	I	30	Dark grayish brown	Sandy loam	L	Many roots	-
LS14	II	40	Yellowish brown	Fine sand	H	Few iron masses and sandstone concretions	-
LS14	III	70	Brown	Fine sand	H	Many iron masses and sandstone concretions	Subsoil
LS15	I	45	Mixed dark grayish brown and yellowish brown	Sandy loam	L	Common roots	-
LS15	II	80	Yellowish brown	Sand	M	-	-
LS15	III	100	Brown	Fine sand	M	Iron masses and sandstone concretions	Subsoil
LS16	I	35	Dark brown	Loam	-	-	-

SHOVEL TEST NO	STRATUM	DEPTH (CM)	MUNSELL	TEXTURE	COMPACTION	INCLUSIONS	COMMENTS
LS16	II	50	Dark gray with reddish brown mottles	Clay	M	Saturated soils	Water table at 35 cmbs
LS17	I	40	Dark grayish brown	Sandy loam	M	Few gravels	-
LS17	II	100	Yellowish brown	Sand	M	Very few gravels	Subsoil
LS18	I	15	Dark brown with strong brown mottles	Sandy loam	L	No gravels	-
LS18	II	45	Dark grayish brown with strong brown mottles	Sandy loam	L	-	Saturated soils
LS18	III	55	Yellowish brown with reddish brown mottles	Sandy loam	M	Sandstone concretions	Subsoil, water table at 55 cmbs
LS19	I	30	Very dark brown	Loam	M	Many roots	-
LS19	II	50	Dark gray with dark yellowish brown mottles	Clay	M	-	Saturated soils, water table at 45 cmbs. In low lying area/drainage
LS20	I	35	Dark grayish brown	Sandy loam	M	Many roots	-
LS20	II	60	Brown with strong brown mottles	Sand	M	Iron masses and sandstone concretions	Saturated soils, inclusions increased with depth, subsoil
LS21	I	50	Mixed very dark brown and dark gray	Loam	M	-	Mixed disturbed, saturated soils
LS22	I	35	Dark grayish brown	Loam	M	Very few gravels	-
LS22	II	60	Gray with strong brown mottles	Clay loam	M	Common to few iron masses	Soil saturation and inclusions increased with depth, subsoil
LS23	I	30	Dark grayish brown	Sandy loam	L	Many roots	-
LS23	II	50	Yellowish brown with dark gray and reddish brown m	Sand	M	Large and small sized sandstone concretions	Saturated soils, water table at 30 cmbs
LS24	I	40	Very dark grayish brown	Loam	M	Many roots	Friable soils, all hydric soils in low lying areas were friable
LS24	II	50	Yellowish brown with strong brown mottles	Sand	H	Sandstone concretions	Saturated soils throughout, water table at 30 cmbs, friable soils
LS25	I	35	Dark grayish brown with yellowish brown mottles	Loam	M	Very few gravels	-
LS25	II	60	Gray with strong brown mottles	Clay loam	M	Common to few iron masses	Soil saturation and inclusions increased with depth, subsoil
LS26	I	35	Dark grayish brown	Sandy loam	M	-	-
LS26	II	55	Mixed yellowish brown and dark grayish brown	Sandy loam	M	-	-
LS26	III	65	Yellowish brown with strong brown mottles	Sand	M	Few iron masses and common sandstone concretions	Subsoil

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APPENDIX D PHOTO LOG

Photo-1
From western end of the Project towards quarried landform

Direction: West
Date: 05/11/21
Photographer: Liz Sefton

Photo-2
Form western end of Project towards quarried landform

Direction: North
Date: 05/11/21
Photographer: Liz Sefton

Photo-3
From western end of Project towards quarried landform and access road to existing tline on ROW

Direction: Southwest
Date: 05/11/21
Photographer: Liz Sefton

Photo-4
From western portion of Project towards quarried landform, underground drainage, and electrical shed

Direction: West
Date: 05/11/21
Photographer: Liz Sefton

Photo-5
From western portion of Project towards quarried landform, existing distribution line, underground drainage

Direction: East
Date: 05/11/21
Photographer: Liz Sefton

Photo-6
From western portion of Project towards evidence of quarrying and existing house and affiliated structures

Direction: South
Date: 05/11/21
Photographer: Liz Sefton

Photo-7
From western portion of Project towards quarried landform, existing distribution line, and underground drainage

Direction: West
Date: 05/11/21
Photographer: Liz Sefton

Photo-8
From western portion of Project towards quarried landform

Direction: North
Date: 05/11/21
Photographer: Liz Sefton

Photo-9
From western portion of Project towards quarried landform, existing distribution line, underground drainage

Direction: East
Date: 05/11/21
Photographer: Liz Sefton

Photo-10
From western portion of Project towards access roads and utilities lines

Direction: West
Date: 05/11/21
Photographer: Liz Sefton

Photo-11
From west of LS01 towards area with ground disturbance i.e. push piles of wood chips, trees and branches, modern cement drain pipes and brick

Direction: North/northeast
Date: 05/11/21
Photographer: Liz Sefton

Photo-12
From west of LS01 towards area with ground disturbance i.e. push piles of wood chips, trees and branches, modern cement drain pipes and brick

Direction: North
Date: 05/11/21
Photographer: Liz Sefton

Photo-13
From area west of LS01 towards modern cement and metal pipes, brick, and cement and asphalt debris on surface . Ground surface is gravel with large cobbles covered in low brush and leaves

Direction: South
Date: 05/11/21
Photographer: Liz Sefton

Photo-14
From area west of LS01 towards modern cement and metal pipes, brick, and cement and asphalt debris on surface . Ground surface is gravel with large cobbles covered in low brush and leaves

Direction: Northeast
Date: 05/11/21
Photographer: Liz Sefton

Photo-15
From area west of LS01 towards modern cement and metal pipes, brick, and cement and asphalt debris on surface . Ground surface is gravel with large cobbles covered in low brush and leaves

Direction: West
Date: 05/11/21
Photographer: Liz Sefton

Photo-16
From area west of LS01 towards modern cement and metal pipes, brick, and cement and asphalt debris on surface . Ground surface is gravel with large cobbles covered in low brush and leaves

Direction: Down
Date: 05/11/21
Photographer: Liz Sefton

Photo-17
From area west of LS01 towards modern cement and metal pipes, brick, and cement and asphalt debris on surface . Ground surface is gravel with large cobbles covered in low brush and leaves

Direction: West
Date: 05/11/21
Photographer: Liz Sefton

Photo-18
Near LS03 towards low lying area and water at surface

Direction: West
Date: 05/11/21
Photographer: Liz Sefton

Photo-19
From LS05 towards newly constructed house and modern junk/trash in ROW

Direction: South/southeast
Date: 05/11/21
Photographer: Liz Sefton

Photo-20
General overview of eastern portion of Project towards LS05

Direction: West
Date: 05/11/21
Photographer: Liz Sefton

Photo-21
From LS05 towards modern junk/trash in ROW

Direction: Northeast
Date: 05/11/21
Photographer: Liz Sefton

Photo-22
From western portion of Project towards railroad

Direction: North
Date: 05/11/21
Photographer: Liz Sefton

Photo-23
From western portion of Project towards railroad and dirt road providing greater than 50 percent ground surface visibility

Direction: Northeast
Date: 05/11/21
Photographer: Liz Sefton

Photo-24
From LS09 towards newly constructed house and installed underground utilities at southern edge of ROW

Direction: southwest
Date: 05/11/21
Photographer: Liz Sefton

Photo-25
LS09 at water table at 50 cmbs

Direction: Down
Date: 05/11/21
Photographer: Liz Sefton

Photo-26
From western portion of City of Amherst property towards water on surface

Direction: Down
Date: 05/11/21
Photographer: Liz Sefton

Photo-27
From western portion of City of Amherst property towards existing substation and stormwater basin

Direction: East
Date: 05/11/21
Photographer: Liz Sefton

Photo-28
From western portion of City of Amherst property towards underdrainage

Direction: West
Date: 05/11/21
Photographer: Liz Sefton

Photo-29
From western portion of City of Amherst property towards existing transmission line

Direction: South
Date: 05/11/21
Photographer: Liz Sefton

Photo-30
From the area between the stormwater basin and existing substation on City of Amherst property towards large, dome-shaped mound that is likely a spoil pile from construction of the stormwater basin

Direction: South
Date: 05/11/21
Photographer: Liz Sefton

Photo-31
From the northwestern corner of City of Amherst property toward the existing substation

Direction: East
Date: 05/11/21
Photographer: Liz Sefton

Photo-32
From the area between the stormwater basin and existing substation on City of Amherst property towards stormwater basin

Direction: West
Date: 05/11/21
Photographer: Liz Sefton

Photo-33
From the western portion of the City of Amherst property towards railroad

Direction: North
Date: 05/11/21
Photographer: Liz Sefton

Photo-34
From the area between the stormwater basin and existing substation on City of Amherst property towards the stormwater basin

Direction: Multi
Date: 05/11/21
Photographer: Liz Sefton

Photo-35
From the area between the stormwater basin and existing substation on City of Amherst property towards the parking lot and southeastern end of Project area

Direction: Multi
Date: 05/11/21
Photographer: Liz Sefton

Photo-36
From the area between the stormwater basin and existing substation on City of Amherst property towards large, dome-shaped mound that is likely a spoil pile from construction of the stormwater basin

Direction: North/northeast
Date: 05/11/21
Photographer: Liz Sefton

Photo-37
From southeast end of Project towards existing substation on City of Amherst Property

Direction: Multi
Date: 05/11/21
Photographer: Liz Sefton

Photo-38
From southern end of City of Amherst property towards stormwater basin and existing transmission lines

Direction: Northwest
Date: 05/11/21
Photographer: Liz Sefton

Photo-39
From southeastern portion of Project towards low lying area and LS22

Direction: Southwest
Date: 05/12/21
Photographer: Liz Sefton

Photo-40
Southeastern portion of Project towards drainage and adjacent landforms

Direction: Northeast
Date: 05/12/21
Photographer: Liz Sefton

Photo-41
Towards Project showing no view from Quarry Road

Direction: Northeast
Date: 05/11/21
Photographer: Liz Sefton

Photo-42
Towards Project showing no view from intersection of Milan Avenue and Hamilton Street

Direction: West
Date: 05/13/21
Photographer: Liz Sefton

Photo-43
Towards Project showing no view from Cortland Circle

Direction: South
Date: 05/13/21
Photographer: Liz Sefton

Photo-44
Towards Project showing no view from W. Martin Avenue

Direction: Southwest
Date: 05/13/21
Photographer: Liz Sefton

Photo-45
Towards Project showing no view from N. Quarry Road

Direction: South
Date: 01/00/00
Photographer: Liz Sefton

Photo-46
Resource B-03 on Cross Road showing narrow view

Direction: Northeast
Date: 05/13/21
Photographer: Liz Sefton

Photo-47
View towards Project near Resource B-02 on Cross Road showing narrow view. Resource B-02 (left)

Direction: Northeast
Date: 05/13/21
Photographer: Liz Sefton

Photo-48
View towards Project from Hamilton Street showing no view

Direction: West
Date: 05/13/21
Photographer: Liz Sefton

Photo-49
View away from Project from Milan Avenue showing no potential view due to tree coverage

Direction: Northwest
Date: 05/13/21
Photographer: Liz Sefton

Photo-50
Elevation of Resource B-01 on Milan Avenue

Direction: North
Date: 05/13/21
Photographer: Liz Sefton

Photo-51
Profile of Resource B-01 on Milan Avenue

Direction: Northwest
Date: 05/13/21
Photographer: Liz Sefton

Photo-52
View towards Project area showing narrow view from Resource B-01 from intersection of Milan Avenue and Apple Orchard Lane

Direction: North
Date: 05/13/21
Photographer: Liz Sefton

Photo-53
View of Milan Avenue from Resource B-01

Direction: Southwest
Date: 05/13/21
Photographer: Liz Sefton

Photo-54
View of store and existing transmission line across street from Resource B-01, showing no view of Project

Direction: Northeast
Date: 05/13/21
Photographer: Liz Sefton

Photo-55
Resource B-02 on Cross Road

Direction: Northeast
Date: 05/13/21
Photographer: Liz Sefton

Photo-56
Elevation of Resource B-02 on Cross Road

Direction: East
Date: 05/13/21
Photographer: Liz Sefton

Photo-57
View facing away from Project near
Resource B-02 on Cross Road

Direction: Northeast
Date: 05/13/21
Photographer: Liz Sefton

Photo-58
View towards Resource B-04a (right) and B-04b (left) from Project

Direction: North
Date: 05/13/21
Photographer: Liz Sefton

Photo-59
View of Project from the south side of the railroad near Resource B-04

Direction: Southeast
Date: 05/13/21
Photographer: Liz Sefton

Photo-60
Resource B-04a

Direction: North
Date: Unknown
Photographer: Lorain County Auditor

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APPENDIX F ECOLOGICAL REPORT

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From: Ohio, FW3 <ohio@fws.gov>
Sent: Thursday, June 10, 2021 2:59 PM
To: Schirtzinger, Lauren <lauren.schirtzinger@powereng.com>
Cc: nathan.reardon@dnr.state.oh.us; Parsons, Kate <kate.parsons@dnr.state.oh.us>; Nietz, Jennifer <jennifer.nietz@powereng.com>
Subject: [EXTERNAL] AMPT Amherst #2 Substation Project, Lorain County, Ohio

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994

TAILS# 03E15000-2021-TA-1486

Dear Ms. Schirtzinger,

The U.S Fish and Wildlife Service (Service) has received your recent correspondence requesting information about the subject proposal. We offer the following comments and recommendations to assist you in minimizing and avoiding adverse impacts to threatened and endangered species pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq), as amended (ESA).

Federally Threatened and Endangered Species: The endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*) occur throughout the State of Ohio. The Indiana bat and northern long-eared bat may be found wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and breed that may also include adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, woodlots, fallow fields, and pastures. Roost trees for both species include live and standing dead trees ≥3 inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities. These roost trees may be located in forested habitats as well as linear features such as fencerows, riparian forests, and other wooded corridors. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. In the winter, Indiana bats and northern long-eared bats hibernate in caves, rock crevices and abandoned mines.

Seasonal Tree Clearing for Federally Listed Bat Species: Should the proposed project site contain trees ≥3 inches dbh, we recommend avoiding tree removal wherever possible. If any caves or abandoned mines may be disturbed, further coordination with this office is requested to determine if fall or spring portal surveys are warranted. If no caves or abandoned mines are present and trees ≥3 inches dbh cannot be avoided, we recommend removal of any trees ≥3 inches dbh only occur between October 1 and March 31. Seasonal clearing is recommended to avoid adverse effects to Indiana bats and northern long-eared bats. While incidental take of northern long-eared bats from most tree clearing is exempted by a 4(d) rule (see http://www.fws.gov/midwest/endangered/mammals/nleb/index.html [fws.gov]), incidental take of Indiana bats is still prohibited without a project-specific exemption. Thus, seasonal clearing is recommended where Indiana bats are assumed present.
If implementation of this seasonal tree cutting recommendation is not possible, a summer presence/absence survey may be conducted for Indiana bats. If Indiana bats are not detected during the survey, then tree clearing may occur at any time of the year. Surveys must be conducted by an approved surveyor and be designed and

conducted in coordination with the Ohio Field Office. Surveyors must have a valid federal permit. Please note that in Ohio summer mist net surveys may only be conducted between June 1 and August 15.

Section 7 Coordination: If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), then no tree clearing should occur on any portion of the project area until consultation under section 7 of the ESA, between the Service and the federal action agency, is completed. We recommend the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence. This letter provides technical assistance only and does not serve as a completed section 7 consultation document.

Stream and Wetland Avoidance: Over 90% of the wetlands in Ohio have been drained, filled, or modified by human activities, thus is it important to conserve the functions and values of the remaining wetlands in Ohio (https://epa.ohio.gov/portals/47/facts/ohio_wetlands.pdf [epa.ohio.gov]). We recommend avoiding and minimizing project impacts to all wetland habitats (e.g., forests, streams, vernal pools) to the maximum extent possible in order to benefit water quality and fish and wildlife habitat. Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the U.S. Army Corps of Engineers should be contacted to determine whether a Clean Water Act section 404 permit is required. Best management practices should be used to minimize erosion, especially on slopes. Disturbed areas should be mulched and revegetated with native plant species. In addition, prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, or proposed species, or proposed or designated critical habitat. Should the project design change, or additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, coordination with the Service should be initiated to assess any potential impacts.

Thank you for your efforts to conserve listed species and sensitive habitats in Ohio. We recommend coordinating with the Ohio Department of Natural Resources due to the potential for the proposed project to affect state listed species and/or state lands. Contact Mike Pettegrew, Acting Environmental Services Administrator, at (614) 265-6387 or at mike.pettegrew@dnr.state.oh.us.

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or ohio@fws.gov.

Sincerely,

Patrice Ashfield
Field Office Supervisor

cc: Nathan Reardon, ODNR-DOW
Kate Parsons, ODNR-DOW

Office of Real Estate
John Kessler, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6621
Fax: (614) 267-4764

July 23, 2021

Lauren Schirtzinger
Power Engineering, Inc.
11733 Chesterdale Road
Cincinnati, Ohio 45246

Re: 21-0520; Amherst No. 2 Substation Project

Project: The proposed project involves the expansion of the existing 69 kilovolt (kV) substation and 0.3 miles of 138 kV transmission line between Amherst #2 Substation and the existing Beaver – Black River 138 kV Transmission Line.

Location: The proposed project is located in Amherst Township, Lorain County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Natural Heritage Database: The Natural Heritage Database has the following records at or within a one-mile radius of the project area:

Round-leaved dogwood (*Cornus rugose*), State potentially threatened
Amherst Beaver Creek Reservation – Lorain Co. Metro Parks

The review was performed on the project area specified in the request as well as an additional one-mile radius. Records searched date from 1980. This information is provided to inform you of features present within your project area and vicinity. Additional comments on some of the features may be found in pertinent sections below.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to streams, wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The entire state of Ohio is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species, the northern long-eared bat (*Myotis septentrionalis*), a state endangered and federally threatened species, the little brown bat (*Myotis lucifugus*), a state endangered species, and the tricolored bat (*Perimyotis subflavus*), a state endangered species. During the spring and summer (April 1 through September 30), these species of bats predominately roost in trees behind loose, exfoliating bark, in crevices and cavities, or in the leaves. However, these species are also dependent on the forest structure surrounding roost trees. If trees are present within the project area, and trees must be cut, the DOW recommends cutting only occur from October 1 through March 31, conserving trees with loose, shaggy bark and/or crevices, holes, or cavities, as well as trees with DBH ≥ 20 if possible. If trees are present within the project area, and trees must be cut during the summer months, the DOW recommends a mist net survey or acoustic survey be conducted from June 1 through August 15, prior to any cutting. Mist net and acoustic surveys should be conducted in accordance with the most recent version of the "*OHIO DIVISION OF WILDLIFE GUIDANCE FOR BAT SURVEYS AND TREE CLEARING*". https://ohiodnr.gov/static/documents/wildlife/wildlife-management/Bat+Survey+Guidelines.pdf

If state listed bats are documented, DOW recommends cutting only occur from October 1 through March 31, however, limited summer tree cutting may be acceptable after consultation with DOW (contact Erin Hazelton, Erin.Hazelton@dnr.ohio.gov)

The DOW also recommends that a desktop habitat assessment, followed by a field assessment if needed, is conducted to determine if there are potential hibernaculum(a) present within the project area. Information about how to conduct habitat assessments can be found in the current USFWS "*Range-wide Indiana Bat Survey Guidelines*." If a habitat assessment finds that potential hibernacula are present within 0.25 miles of the project area, please send this information to Erin Hazelton, Erin.Hazelton@dnr.ohio.gov for project recommendations. If a potential or known hibernaculum is found, the DOW recommends a 0.25-mile tree cutting and subsurface disturbance buffer around the hibernaculum entrance, however, limited summer or winter tree cutting may be acceptable after consultation with DOW. If no tree cutting or subsurface impacts to a hibernaculum are proposed, this project is not likely to impact these species.

The project is within the range of the black sandshell (*Ligumia recta*), a state threatened mussel, and the pondhorn (*Uniomerus tetralasmus*), a state threatened mussel. Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.

The project is within the range of the following listed fish species:

State Endangered
lake sturgeon (*Acipenser fulvescens*)
Ohio lamprey (*Ichthyomyzon bdellium)*
spotted gar (*Lepisosteus oculatus*)

State Threatened
American eel (*Anguilla rostrata*)
bigmouth shiner (*Notropis dorsalis*)
channel darter (*Percina copelandi*)

The DOW recommends no in-water work in perennial streams from March 15 through June 30 to reduce impacts to indigenous aquatic species and their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact these or other aquatic species.

The project is within the range of the Blanding's turtle (*Emydoidea blandingii*), a state threatened species. This species inhabits marshes, ponds, lakes, streams, wet meadows, and swampy forests. Although essentially aquatic, the Blanding's turtle will travel over land as it moves from one wetland to the next. Due to the location, the type of habitat within the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the spotted turtle (*Clemmys guttata*), a state threatened species. This species prefers fens, bogs and marshes, but also is known to inhabit wet prairies, meadows, pond edges, wet woods, and the shallow sluggish waters of small streams and ditches. Due to the location, the type of habitat within the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the American bittern (*Botaurus lentiginosus*), a state endangered bird. Nesting bitterns prefer large undisturbed wetlands that have scattered small pools amongst dense vegetation. They occasionally occupy bogs, large wet meadows, and dense shrubby swamps. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, the project is not likely to impact this species.

The project is within the range of the black-crowned night-heron *(Nycticorax nycticorax*), a state-threatened bird. Night-herons are so named because they are nocturnal, conducting most of their foraging in the evening hours or at night, and roost in trees near wetlands and waterbodies during the day. Night herons are migratory and are typically found in Ohio from April 1 through December 1 but can be found in more urbanized areas with reliable food sources year-round. Black-crowned night-herons primarily forage in wetlands and other shallow aquatic habitats, and roost in trees nearby. These night-herons nest in small trees, saplings, shrubs, or sometimes on the ground, near bodies of water and wetlands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the lark sparrow (*Chondestes grammacus*), a state endangered bird. This sparrow nests in grassland habitats with scattered shrub layers, disturbed open areas, as well as patches of bare soil. These summer residents normally migrate out of Ohio shortly after their young fledge or leave the nest. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the least bittern (*Ixobrychus exilis*), a state threatened bird. This secretive marsh species prefers dense emergent wetlands with dense, tall growths of aquatic or semiaquatic vegetation (particularly cattail, sedge, rushes, arrowheads, or sawgrass) interspersed with clumps of woody vegetation and open water. Nests are made from dried vegetation suspended .5 to 2.5 feet above the water. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the northern harrier (*Circus hudsonis*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a

nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 through July 31. If this habitat will not be impacted, the project is not likely to impact this species.

The project is within the range of the sandhill crane (*Grus canadensis*), a state endangered species. Sandhill cranes are primarily a wetland-dependent species. On their wintering grounds, they will utilize agricultural fields; however, they roost in shallow, standing water or moist bottomlands. On breeding grounds, they require a rather large tract of wet meadow, shallow marsh, or bog for nesting. If grassland, prairie, or wetland habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 1 through August 31. If this habitat will not be impacted, this project is not likely to have an impact on this species.

The project is within the range of the trumpeter swan (*Cygnus buccinator*), a state threatened bird. Trumpeter swans prefer large marshes and lakes ranging in size from 40 to 150 acres. They like shallow wetlands one to three feet deep with a diverse mix of plenty of emergent and submergent vegetation and open water. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 through June 15. If this habitat will not be impacted, this project is not likely to have an impact on this species.

The project is within the range of the upland sandpiper (*Bartramia longicauda*), a state endangered bird. Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (CRP). If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

Natural Areas: The Division of Natural Areas and Preserves has the following comment.

Two rare plant species, the round-leaved dogwood (*Cornus rugosa*, state species of concern) and rock harlequin (*Capnoides sempervirens,* state endangered) have previously been found within the footprint of the proposed Amherst #2 substation project. Due to the possible disruption of these species, a pre-construction survey of the proposed project site should be conducted to ensure that the plants and any other rare species within the proposed construction limits are not impacted. If there are any questions about Ohio flora or if survey assistance is required, please contact the Division of Natural Areas and Preserves' Chief Botanist, Rick Gardner. Mr. Gardner can be contacted directly at richard.gardner@dnr.ohio.gov or (614) 265-6419.

Water Resources: The Division of Water Resources has the following comment.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project. Your local floodplain administrator contact information can be found at the website below.

http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List_8_16.pdf

ODNR appreciates the opportunity to provide these comments. Please contact Sarah Tebbe, Environmental Specialist, at Sarah.Tebbe@dnr.ohio.gov if you have questions about these comments or need additional information.

Mike Pettegrew
Environmental Services Administrator (Acting)

Orbis Environmental Consulting
PO Box 10235 South Bend, IN 46680
574-635-1338

November 5, 2021

Jennifer Nietz
POWER Engineers
6530 W. Campus Oval
Suite 200
New Albany, OH 43054

Re: Amherst, Ohio Rare Plant Field Survey (Orbis #2107014)

Dear Ms. Nietz:

Orbis Environmental Consulting (Orbis) was contracted by POWER Engineers (POWER) to conduct a field survey for the Ohio-listed plants *Capnoides sempervirens* (rock-harlequin) and *Cornus rugosa* (round-leaved dogwood) in a proposed utility project site in Amherst, Lorain County, Ohio (Orbis #2107014). The following report summarizes the results of the survey.

INTRODUCTION

In July 2021, POWER contracted with Orbis to conduct a field survey for two vascular plant species of conservation concern in Ohio that were historically documented from the vicinity of a proposed utility project site, consisting of a 0.7-mile long, 300' wide corridor located near Quarry Road in Amherst, Lorain County, Ohio (Figure 1). *Capnoides sempervirens* (rock-harlequin) is a biennial herb characteristic of rocky habitats, particularly in areas of recent soil disturbance, and is known in Ohio primarily from the Allegheny Plateau region (Kartesz 2015). It is listed as an Endangered species in Ohio (Ohio Department of Natural Resources 2021). *Cornus rugosa* (round-leaved dogwood) is a rhizomatous shrub of forests, thickets, and shores, known in Ohio primarily from the counties bordering Lake Erie (Cooperrider 1995; Kartesz 2015). It is listed as a Potentially Threatened species in Ohio (Ohio Department of Natural Resources 2021). Orbis was also contracted to record any other listed plant species incidentally observed at the project site. The field survey was conducted on October 5, 2021.

METHODS

On October 5, 2021, Orbis visited the site and conducted visual surveys for *Capnoides sempervirens*, *Cornus rugosa*, and other listed plant species in the approximately 0.7-mile long, 300' wide project site (Figure 1). For each individual or population of a state-listed plant species observed in the field, Orbis planned to record its location using a hand-held GPS unit and document information on life stages (flowering vs. non-flowering), occupied habitats/microhabitats, and associated species. Representative photographs were also taken.

RESULTS

The project site is part of a suburban landscape on the west side of Amherst. Landcover is a mix of suburban development, including residences and associated roads and driveways, lawn, an electrical substation and associated poles, a constructed retention wetland, old field, and immature forest (Figure 1). Sandstone outcrops are prevalent on and near the western portion of the project site, and at least one former quarry is present.

The principal habitats of interest were the wooded areas and sandstone outcroppings. The forests on site are characterized by immature, mixed canopies consisting primarily of *Acer rubrum* (red maple), *Juglans nigra* (black walnut), *Liriodendron tulipifera* (tulip tree), *Populus deltoides* (cottonwood), *Quercus rubra* (red oak), *Sassafras albidum* (sassafras), *Tilia americana* (basswood), and *Ulmus rubra* (slippery elm). Common native understory species included *Cornus drummondii* (rough-leaved dogwood), *Fraxinus americana* (white ash), *Hamamelis virginiana* (witch-hazel), and *Ostrya virginiana* (hop-hornbeam). Invasive species were abundant, represented by *Berberis aquifolium* (Oregon-grape), *Frangula alnus* (glossy buckthorn), *Ligustrum vulgare* (common privet), *Lonicera* spp. (non-native honeysuckles), *Morus alba* (white mulberry), *Pyrus calleryana* (Bradford pear), *Rhamnus cathartica* (common buckthorn), *Rosa multiflora* (multiflora rose), and *Viburnum opulus* (European highbush-cranberry). The low shrub and herbaceous layer consisted primarily of weedy native and non-native taxa such as *Ageratina altissima* (white snakeroot), *Alliaria petiolata* (garlic mustard), *Dactylis glomerata* (orchard grass), *Geum canadense* (white avens), *Leonurus cardiaca* (motherwort), *Persicaria longiseta* (creeping smartweed), *P. virginica* (jumpseed), *Phytolacca americana* (pokeberry), *Rubus allegheniensis* (common blackberry), and *R. occidentalis* (black raspberry).

The sandstone outcroppings on site are largely degraded, having been impacted by quarrying, railroad construction, and suburban development more generally. They support many of the aforementioned weedy native and non-native species, but less disturbed areas support a scattering of more conservative species, including *Heuchera americana* (alum root), *Micranthes virginiensis* (early saxifrage), and *Sambucus racemosa* (red-berried elder).

No individuals or populations of *Capnoides sempervirens*, *Cornus rugosa*, or other Ohio-listed plant species were observed at the project site.

DISCUSSION

No state-listed plant species were observed at the project site. Existing landcover is primarily cultural (infrastructure, including lawns) and ruderal (young forests on formerly cleared ground; old fields and thickets in former quarry and in utility right-of-way). The extent and severity of land disturbance and abundance of invasive plant species indicate low potential for *Capnoides sempervirens*, *Cornus rugosa*, and other listed plant species.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of the October 5 field survey, no listed plant species are likely to be impacted by construction activities conducted within the 0.7-mile long, 300' wide project site, and no further surveys are suggested.

Sincerely,

Brad Slaughter
Botanist

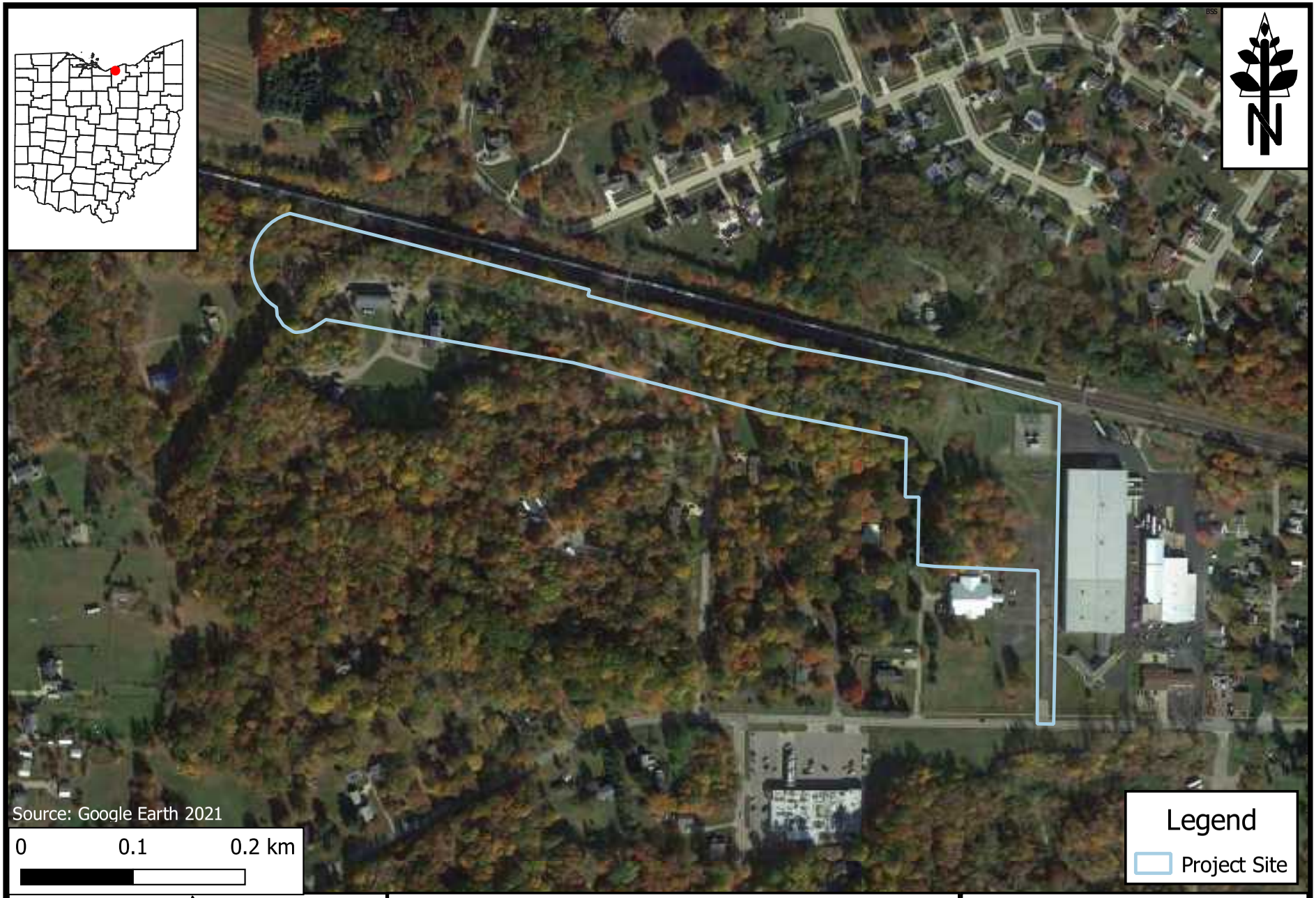
attachments: Figure 1
Photopages
#2107014

LITERATURE CITED

Cooperrider, T.S. 1995. The *Dicotyledoneae* of Ohio, Part Two: Linaceae through Campanulaceae. Ohio State University Press, Columbus.

Kartesz, J.T. 2015. The Biota of North America Program (BONAP). North American Plant Atlas. Available at http://bonap.net/napa (Accessed November 3, 2021).

Ohio Department of Natural Resources. 2021. Rare native Ohio plants: 2020-21 status list. Available at https://ohiodnr.gov/static/documents/natural-areas/2020-21+Ohio+Rare+Native+Plants+Status+List+FINAL.pdf (Accessed November 3, 2021).



orbis

Rare Plant Field Survey
POWER Engineers
Amherst, Lorain County, Ohio

Figure #1
Project Site
Project #2107014

1 – Trees with mowed lawn understory on Amherst Fraternal Order of Eagles property.

2 – Mowed lawn and constructed retention basin on City of Amherst property.

3 – Retention basin on City of Amherst property with weedy old field vegetation.

4 – *Cornus drummondii* (rough-leaved dogwood), which is common at the project site, differs from the listed *C. rugosa* (round-leaved dogwood) in having 3-5 lateral veins per leaf side and twigs with brown pith (vs. 6-8 lateral veins and twigs with white pith in *C. rugosa*).

5 – Immature forest on private property south of the Norfolk Southern rail line.

6 – Relatively intact sandstone outcropping with *Dryopteris marginalis* (marginal woodfern), on private property along access drive.

7 – Quarry face just south of project site.

8 – Sandstone outcropping (or modified berm) along private property access drive.

9 – Dense stands of the non-native *Artemisia vulgaris* (mugwort) cover sandstone rubble in an old quarry on private property near the western margin of the project site.

10 – Repeatedly disturbed utility corridor with weedy species at the west margin of the project site.

From: Richard.Gardner@dnr.ohio.gov
To: Nietz, Jennifer
Cc: Branham, Lindsey
Subject: [EXTERNAL] RE: Botanical Survey Questions- Amherst #2
Date: Monday, November 8, 2021 12:40:13 PM
Attachments: image003.png
image004.jpg
image005.png
image006.png

Hi Jennifer,

Thank you for sending me the detailed report. Brad Slaughter with Orbis is an excellent botanist and he certainly would have found any state listed plants if they were present. From the report, I conclude no additional survey work is necessary and the project will not impact any state endangered and threatened plant populations.

Thank you.

Rick Gardner, Chief Botanist
Ohio Department of Natural Resources
Division of Natural Areas and Preserves
2045 Morse Road, H-3
Columbus, OH 43229
614-265-6419 (Office)
614-745-6781 (Cell)

From: jennifer.nietz@powereng.com <jennifer.nietz@powereng.com>
Sent: Monday, November 8, 2021 12:25 PM
To: Gardner, Richard <Richard.Gardner@dnr.ohio.gov>
Cc: lindsey.branham@powereng.com
Subject: RE: Botanical Survey Questions- Amherst #2

Hi Rick,

As we discussed, I've attached the RTE plant report for the AMP Transmission Amherst #2 Project (Project) in Amherst, Ohio. Please review the report and provide your written/emailed concurrence that no further surveys are required and no impacts to RTE plant species are likely to occur in association with the Project. Your response email/letter will be included with AMPT's OPSB filing.

If you have any questions, please give me a call.

Thank you,

Jennifer

JENNIFER NIETZ
DEPARTMENT MANAGER OF EASTERN BIOLOGY
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[gcc02.safelinks.protection.outlook.com]

From: Richard.Gardner@dnr.ohio.gov <Richard.Gardner@dnr.ohio.gov>
Sent: Wednesday, July 28, 2021 2:54 PM
To: Nietz, Jennifer <jennifer.nietz@powereng.com>
Subject: [EXTERNAL] RE: Botanical Survey Questions- Amherst #2

Yes both species should be visible at that time. Rock harlequin is a winter annual, often sending up leaves late in the season.

Rick Gardner, Chief Botanist
Ohio Department of Natural Resources
Division of Natural Areas and Preserves
2045 Morse Road, A-2
Columbus, OH 43229
614-265-6419 (Office)
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POWER ENGINEERS, INC.
6530 W. CAMPUS OVAL ROAD
2ND FLOOR, SUITE 200
NEW ALBANY, OH 43054
PHONE 614-441-0900

March 11, 2022

Kim Magovac, P.E.
Director of Transmission Project Management
AMP Transmission, LLC
111 Schrock Road, Suite 100
Columbus, OH 43229

Subject: AMP Transmission, LLC Amherst #2 Substation and 138 kV Transmission Line Project, Amherst, Lorain County, Ohio
Ecological Survey Report

Dear Ms. Magovac:

This ecological survey report presents a summary of the results of the ecological survey and desktop analysis conducted by POWER Engineers, Inc. (POWER) for AMP Transmission, LLC's proposed Amherst #2 Substation and 138 kilovolt (kV) Transmission Line Project (Project), in the City of Amherst, Lorain County, Ohio. The report provides a summary of both the wetland and regulated waters delineation as well as the threatened and endangered species agency records review and cursory habitat assessment of the Project site.

The proposed Project consists of the expansion of the existing 69 kV Amherst #2 Substation and 0.4 mile of 138 kV transmission line between Amherst #2 Substation and the existing First Energy-owned Beaver – Black River 138 kV Transmission Line. The substation portion of the site is located on an approximately 2.0-acre parcel behind an existing retail storefront at 1163 Milan Avenue, Amherst, Ohio. The purpose of the Project is to improve the reliability of the local electrical grid. An overview Project Location Map is presented in Figure 1.

AMP Transmission, LLC retained POWER to determine the boundaries and limits of streams, wetlands, and other aquatic resources within the survey area; provide a professional opinion of whether the United States Army Corps of Engineers (USACE) and/or the Ohio Environmental Protection Agency (OEPA) would regulate the aquatic resources; characterize the existing site conditions; and complete a cursory review of the Project site for potential threatened and endangered species habitat. The findings and results of the assessment are described below.

1.0 METHODOLOGY

POWER biologists identified streams, wetlands, and other aquatic resources during an on-site assessment of the survey area completed on May 11, 2021. Field surveys were performed within a survey area that generally encompassed the area around 0.4 mile of proposed transmission line between Amherst #2 Substation and the existing Beaver – Black River 138 kV Transmission Line and the proposed substation expansion area. The total survey area reviewed for the proposed Project comprises approximately 16 acres. The survey area is depicted in Figure 2.

A handheld Trimble Global Positioning System (GPS) unit capable of submeter accuracy was used to gather data points and determine boundaries of the aquatic resources and other important features. A visual survey was also conducted for aquatic resources that may be situated immediately outside the survey area and could be affected by construction. The field-collected resource locations and data points, as well as National Hydrography Dataset streams and waterbodies, National Wetland Inventory wetlands, and the survey area are depicted in Figure 2. The dimensions and characteristics of the delineated aquatic resources can be found in Tables 1 and 2.

Locations of wetland determination data points were selected in accordance with procedures outlined in the USACE *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*. Paired wetland data points (i.e., one wetland data point and one upland data point) were taken for each wetland. Based on field observations and/or desktop analysis, additional data points were recorded in areas considered to be potentially suitable for wetland development and to characterize existing site conditions.

During the field surveys, the OEPA's *Ohio Rapid Assessment Method* (ORAM) was used to evaluate the identified wetlands within the survey area. The OEPA *Headwater Habitat Evaluation Index* was used to assess streams with drainage areas less than one square mile.

Due to the U.S. District Court order on August 30, 2021, vacating and remanding the Navigable Waters Protection Rule, POWER's professional opinion on jurisdictional status of identified wetlands and streams is based on field connectivity observations, desktop review, and current guidance provided by the U.S. Environmental Protection Agency (USEPA). Based upon the 2021 ruling, the USEPA and USACE are currently interpreting "Waters of the United States" (WOTUS) consistent with the pre-2015 regulatory regime. This includes implementation of the definition of WOTUS under the Clean Water Act (CWA) following the 1986 and 1988 regulatory definition together with the Rapanos v. United States, Carabell v. United States, and SWANCC Supreme Court decisions, which includes adjacent waters and those that may have a significant nexus to a Traditional Navigable Water (TNW). In addition, isolated wetlands could be considered waters of the State and may be regulated by the OEPA. Information on potential jurisdictional status of identified streams and wetlands is provided below in text and in Tables 1 and 2.

Streams identified within the survey area exhibited a defined bed and bank with substrate sorting or other ordinary high-water mark (OHWM) indicators and were classified in accordance with the USACE Jurisdictional Determination Form Instructional Guidebook. POWER biologists characterized the flow regime of identified streams on field observations and desktop review. Noted flow regimes are based on the following:

- Ephemeral streams are precipitation-dependent and carry water only during and immediately after periods of rainfall or snowmelt and are characterized as having a well-defined channel with no significant habitat for aquatic fauna.

- Intermittent streams carry water for extended periods of time but cease to flow occasionally or seasonally during periods of low precipitation or drought. Signs of seasonal flow include scouring, sediment deposits, undercut banks, and/or isolated pools that may support aquatic life.

- Perennial streams typically carry water throughout the year except during extreme drought. Pool depths may be deeper compared to intermittent streams and will often have evidence of aquatic fauna such as macroinvertebrates and fish.

Delineated aquatic resources within the survey area were given an identifier based on the order collected in the field. For example, a wetland with the identifier "WET-1" equates to WET (wetland) -1 (first collected data point, numbered sequentially). Similarly, delineated streams were given the identifier "STRM" and were labeled in a similar manner to wetlands. Additional upland data points collected during the field surveys and were also given an identifier based on the order collected in the field, however, letters were used to avoid confusion with the upland points associated with a wetland. For example, an additional upland data point with the identifier UDP-A equates to UDP (upland data point) – A (first collected additional data point, lettered alphabetically).

POWER submitted a letter to the United States Fish and Wildlife Service (USFWS) and an Environmental Review (ER) request letter to the Ohio Department of Natural Resources (ODNR) requesting any known occurrences of federally or state listed threatened or endangered species as well as any areas of designated critical habitat on-site or within a one-mile radius of the Project on May 24, 2021. During the on-site assessment for wetlands and streams, POWER biologists performed a cursory visual assessment of the survey area for any potential protected species habitat, rare or unique habitats, and migratory bird nests such as bald eagles (*Haliaeetus leucocephalus*), hawks (family *Accipitridae*), and herons (family *Ardeidae*).

2.0 RESULTS

2.1 Wetland and Stream Assessment

POWER biologists identified one 0.13-acre Palustrine Forested (PFO) wetland and two Palustrine Emergent (PEM) wetlands totaling 0.14-acre within the survey area (Figure 2). Details of each wetland are included in Table 1. Representative photographs of these wetlands are included in Attachment A. The USACE Wetland Determination Data Forms for these wetlands are included as Attachment B. The corresponding upland data forms, as well as the additional upland data points collected are included as Attachment C. The completed 10-page ORAM forms are included as Attachment D. POWER's preliminary determination is that WET-1 is likely jurisdictional based on its connection via a stormwater catch basin that discharges to an unnamed tributary of Quarry Creek, which is hydrologically connected to Lake Erie. WET-2 is likely jurisdictional based on its connection to a drainage ditch that flows to an unnamed tributary of Quarry Creek. WET-3 is likely jurisdictional based on its connection to an unnamed intermittent tributary to Quarry Creek.

POWER biologists identified one intermittent stream totaling 20 feet within the survey area (Figure 2). The stream channel exhibited at least one OHWM as described in USACE Regulatory Guidance Letter 05-05. Additional details on the stream can be found in Table 2. Representative photographs of the stream can be found in Attachment A. Based on field observations, the delineated stream is likely jurisdictional by the USACE, due to exhibiting an intermittent flow regime that contributes surface flow to a Traditionally Navigable Water. A preliminary Headwater Habitat Evaluation Index score and designation for the stream was collected and is included in Table 2 with the data form presented in Appendix E. POWER biologists determined that the delineated stream has a hydrological connection to Lake Erie, a Traditionally Navigable Water, and therefore will likely to be considered jurisdictional by the USACE (i.e., a WOTUS).

POWER identified one man-made stormwater basin during the site visit. The stormwater basin met all three wetland criteria at the time of the site visit. POWER was provided the 2006 construction plans for the basin. Based on a review of historical aerials provided by Google Earth, the stormwater basin was constructed between 2006 and 2009 per the provided site design plan. POWER did not observe any outflows that may be hydrologically connected to downstream aquatic resources during the site visit. Based on the status as a documented man-made stormwater detention system, it is POWER's opinion that the stormwater detention basin should not be regulated by the federal or state agencies. The stormwater basin is depicted on Figure 2 and photos can be seen on the photo page for UDP-A in Appendix B.

Several ditches were also identified within the survey area. Based on observations made during field investigations POWER's preliminary determination is that one of the identified drainage ditches located north of WET-2 provides a connection to an Unnamed tributary of Quarry Creek, and therefore may be considered jurisdictional. The other the identified drainage features are likely not jurisdictional, as it lacks a defined bed and bank and does not appear to provide a connection from upslope aquatic resources to other downslope streams or wetlands.

2.2 Rare, Threatened, and Endangered Species

POWER received a response from the USFWS on June 10, 2021, indicating that the proposed Project is in the vicinity of the Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*), both federally listed species. The USFWS indicated that summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and breed and may also include adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, woodlots, fallow fields, and pastures. The USFWS recommended that trees be saved wherever possible, and that the removal of any trees three inches or more in diameter at breast height (dbh) only occur between October 1 and March 31. The USFWS also recommended avoiding and minimizing impacts on wetland habitats to the extent possible, to benefit water quality and fish and wildlife habitat. The USFWS stated that due to the project type, size, and location, they do not anticipate adverse effects to any other federally endangered, threatened, or proposed species, or proposed or designated critical habitat. POWER submitted an ER Request to the ODNR and received a response on July 23, 2021. The ODNR provided several comments, which are provided in Table 3. The Division of Natural Areas and Preserves identified two rare plant species within the proposed Project area. These rare plant species include the round-leaved dogwood (*Cornus rugosa*), a state species of concern, and rock harlequin (*Capnoides sempervirens*), a state endangered species. These two species were reported by the Division of Natural Areas and Preserves as having previously been found within the footprint of the

proposed Project. A rare plant survey was conducted on October 5, 2021, which resulted in no rare, threatened, or endangered plant species identified within the Project area. The rare species report is included in Appendix F along with copies of the agency responses.

During the on-site assessment for wetlands and streams, POWER biologists performed a cursory visual assessment of the survey area for any potential protected species habitat, rare or unique habitats, and migratory bird nests such as bald eagles, hawks, and herons. During the habitat assessment POWER did not observe any migratory bird nests. Additionally, POWER observed a few trees exhibiting roost habitat characteristics for the Indiana or northern long-eared bats. No caves or mine portals were observed within the survey area, and there are no records of any near the site. Impacts to these bat species are anticipated to be avoided with winter tree clearing. If winter tree clearing isn't feasible, then presence/absence surveys may be needed. No other state- or federally-listed species nor any unique habitats were observed during the on-site assessment.

2.3 Habitat Characterization

The Project survey area consisted of predominately forested land and mowed grass at the time of the field review. The dominant plant species found within the forested land were pin oak (*Quercus palustris*), American sycamore (*Platanus occidentalis*), sugar maple (*Acer saccharum*), American elm (*Ulmus americana*), red maple (*Acer rubrum*), tulip poplar (*Liriodendron tulipifera*), spice bush (*Lindera benzoin*), spotted jewelweed (*Impatiens capensis*), and Japanese honeysuckle (*Lonicera japonica*). The dominant plant species in the mowed grass portion of the site included Kentucky bluegrass (*Poa pratensis*), annual bluegrass (*Poa annua*), yellow sweet clover (*Melilotus officinalis*), narrowleaf plantain (*Plantago lanceolata*), and white clover (*Trifolium repens*). A Land Use Map is presented as Figure 3.

3.0 SUMMARY AND RECOMMENDATIONS

POWER biologists identified three wetlands totaling 0.27-acre within the survey area. One stream was identified totaling 20 feet within the survey area. One man-made stormwater basin was identified on the eastern portion of the site. Based on observations made during field investigations, WET-1, WET-2, WET-3, and STRM-1 are likely to be considered jurisdictional by the USACE.

The stormwater basin met all three wetland criteria at the time of the site visit. However, based on the provided construction plans for the basin from 2006 and the lack of observed outflows to downstream aquatic resources, it is POWER's opinion that the stormwater detention basin should not be regulated by the USACE or OEPA. Additional drainage ditches were also identified within the survey area. Based on observations made during field investigations and desktop reviews, the drainage ditch located north of WET-2 provides a connection to an Unnamed tributary of Quarry Creek, and therefore may be considered jurisdictional. The other the identified drainage features is likely non-jurisdictional by the USACE and not regulated. No state- or federally-listed species and no unique habitats were observed during the on-site assessment.

Depending on the extent of earth disturbance in the final engineering design, additional coordination and permitting for impacts to jurisdictional WOTUS may be required. Any required tree removal should be performed during the seasonal tree clearing window between October 1 and March 31. If tree clearing must occur between April 1 and September 30, consultation with

the USFWS is recommended. Additionally, no adverse impacts to migratory bird nests such as bald eagles, hawks, and herons are anticipated as a result of the Project.

This letter reports the results of the ecological survey performed for the AMP Transmission, LLC Amherst #2 Substation and 138 kV Transmission Line Project. If proposed construction activity will require impacts to aquatic resources, POWER recommends that this report be submitted to the USACE for verification and jurisdictional determination along with any necessary permitting.

Sincerely,

Lauren Schirtzinger
Biologist / Wetland Ecologist
POWER Engineers, Inc.

TABLE 1 DELINEATED WETLANDS IDENTIFIED WITHIN THE SURVEY AREA

WETLAND ID	COWARDIN CLASSIFICATION[1]	ACREAGE WITHIN SURVEY AREA	ORAM CATEGORY (SCORE)	COORDINATES OF CENTER POINT OF WETLAND		CONNECTION TO NEAREST WATERWAY[2]	OPINION OF JURISDICTION[3,4]
WET-1	PEM	0.13	1 (17)	41.400917	-82.248724	Adjacent to unnamed tributary to Quarry Creek and Lake Erie	Jurisdictional
WET-2	PFO	0.13	Modified 2 (37)	41.401335	-82.250611	Adjacent to unnamed tributary to Quarry Creek and Lake Erie	Jurisdictional
WET-3	PEM	0.01	1 (15)	41.402375	-82.254104	Adjacent to an unnamed tributary to Quarry Creek and Lake Erie	Jurisdictional
PROJECT TOTAL		**0.27**					

[1] PEM = Palustrine Emergent, PFO = Palustrine Forested
[2] Connection to nearest potentially jurisdictional waterway, based on observations made during field review.
[3] Note that the official determination of the jurisdictional status of onsite features is under the purview of the USACE and may require an onsite inspection with USACE representatives in order to provide an official jurisdictional determination.
[4] Jurisdictional = Wetlands adjacent to or abutting aquatic resources regulated by the USACE.

TABLE 2 DELINEATED STREAMS IDENTIFIED WITHIN THE SURVEY AREA

STREAM ID	FLOW REGIME	LENGTH WITHIN SURVEY AREA (FEET)	HHEI SCORE	WATERS TYPE[1]	COORDINATES OF CENTER POINT OF STREAM		WATERWAY NAME	LIKELY JURISDICTIONAL STATUS[2,3]
STRM-1	Intermittent	20	48 (Modified Class II)	RPW	41.402445	-82.254205	Unnamed tributary to Quarry Creek and Lake Erie	Jurisdictional
PROJECT TOTAL		**20**						

[1] RPW = Relatively Permanent Water
[2] Based on observations made during field review; note that the official determination of the jurisdictional status of onsite features is under the review of the USACE and they may require an onsite inspection with USACE representatives in order to provide an official jurisdictional determination.
[3] Jurisdictional = Streams with apparent connection or potential significant nexus to downstream aquatic resources regulated by the USACE.

TABLE 3 THREATENED AND ENDANGERED SPECIES TABLE

COMMON/ *SCIENTIFIC NAMES*	STATE LISTED STATUS	FEDERALLY LISTED STATUS	TYPICAL HABITAT DESCRIPTION[1]	HABITAT OBSERVED IN SURVEY AREA[2]	AGENCY COMMENT (APPENDIX D)	POTENTIAL IMPACTS AND AVOIDANCE DATES
Indiana bat/ *Myotis sodalis*	E	E	During the spring and summer (April 1 through September 30), these species of bats habitat comprises of forested/wooded areas where they usually roost under loose tree bark on dead or dying trees. Winter hibernation habitat consists of caves or, occasionally, abandoned mines. Tree cutting between October 1 and March 31 is recommended.	Yes; Potential roost tree summer habitat was observed across the Project survey area, but no potential portal or hibernaculum was observed	ODNR/USFWS- Cutting of trees is recommended to occur between October 1 and March 31. If seasonal tree cutting is not possible, a mist net survey or acoustic survey may be conducted by an approved surveyor between June 1 and August 15. ODNR-If a habitat assessment finds that potential hibernacula are present within 0.25 mile of the project area, please send this information to Erin Hazelton, at Erin.Hazelton@dnr.ohio.gov for project recommendations. If a potential or known hibernaculum is found, the DOW recommends a 0.25-mile tree cutting and subsurface disturbance buffer around the hibernaculum entrance, however, limited summer or winter tree cutting may be acceptable after consultation with DOW. If no tree cutting or subsurface impacts to a hibernaculum are proposed, this project is not likely to impact these species.	No; Impacts are avoided with winter tree clearing. If winter tree clearing isn't feasible, then presence/absence surveys may be needed.
Northern long-eared bat/ *Myotis septentrionalis*	E	T				
Little brown bat/ *Myotis lucifugus*	E	n/a				
Tricolored bat/ *Perimyotis subflavus*	E	n/a				

COMMON/ *SCIENTIFIC NAMES*	STATE LISTED STATUS	FEDERALLY LISTED STATUS	TYPICAL HABITAT DESCRIPTION[1]	HABITAT OBSERVED IN SURVEY AREA[2]	AGENCY COMMENT (APPENDIX D)	POTENTIAL IMPACTS AND AVOIDANCE DATES
Amherst Beaver Creek Reservation – Lorain Co. Metro Parks	n/a	n/a	A Conservation Site is an area deemed by the Natural Heritage Database to be a high-quality natural area not currently under formal protection. It may, for example, harbor one or more rare species, be an outstanding example of a plant community or have geologically significant features, etc. These sites may be in private ownership and our listing of them does not imply permission for access.	No	ODNR- NHD record within a one-mile radius of the project area USFWS - n/a	No; Known habitat types are not present within the project area.
Black sandshell/ *Ligumia recta*	T	n/a	Most commonly occupies rivers with strong currents and lakes with a firm substrate of gravel or sand.	No	ODNR- Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact this species. USFWS-n/a	No; Known habitat types are not present within the Project area.
Pondhorn/ *Uniomerus tetralasmus*	T	n/a	Ponds, small creeks, and the headwaters of larger streams in mud or sand.	No	ODNR- Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species. USFWS- n/a	No; Known habitat types are not present within the Project area.
lake sturgeon/ *Acipenser fulvescens*	E	n/a	Generally benthic species and occur in large rivers and shallow areas of large lakes. They are most often associated with unvegetated deep run and pool habitats (>5ft) in rivers. In lakes, habitat use varies and depends on availability. Spawning often occurs in gravel bottom streams, but rocky, wave-swept lake shore and islands areas are also used when riverine habitats are unavailable.	No	ODNR- The DOW recommends no in-water work in perennial streams from March 15 through June 30 to reduce impacts to indigenous aquatic species and their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact these or other aquatic species. USFWS- n/a	No; Known habitat types are not present within the Project area.

COMMON/ *SCIENTIFIC NAMES*	STATE LISTED STATUS	FEDERALLY LISTED STATUS	TYPICAL HABITAT DESCRIPTION[1]	HABITAT OBSERVED IN SURVEY AREA[2]	AGENCY COMMENT (APPENDIX D)	POTENTIAL IMPACTS AND AVOIDANCE DATES
Ohio lamprey/ *Ichthyomyzon bdellium*	E	n/a	Adults are found in medium to large rivers; they lay their eggs in nests constructed in gravel streambeds. The ammocoete larvae burrow into the muddy bottoms of tributary streams to feed by filtration. This species remains in larval form for about four years, and lives for two more as an adult.	No	ODNR- please see comment for lake sturgeon. USFWS- n/a	No; Known habitat types are not present within the Project area.
spotted gar/ *Lepisosteus oculatus*	E	n/a	Prefers shallow open waters, usually 3 to 5 m deep, as well as stagnant backwater. They are often found near the surface basking near fallen logs, trees, or brush.	No	ODNR- please see comment for lake sturgeon. USFWS- n/a	No; Known habitat types are not present within the Project area.
American eel/ *Anguilla rostrata*	T	n/a	Soft bottoms of medium to large streams.	No	ODNR- please see comment for lake sturgeon. USFWS- n/a	No; Known habitat types are not present within the Project area.
bigmouth shiner/ *Notropis dorsalis*	T	n/a	Prefers moderately fast-moving creeks and streams less than 3 feet deep, but is occasionally found in larger rivers as well	No	ODNR- please see comment for lake sturgeon. USFWS- n/a	No; Known habitat types are not present within the Project area.
Channel darter/ *Percina copelandi*	T	n/a	Inhabits rivers and large creeks in areas of moderate current over sand and gravel substrates.	No	ODNR- please see comment for lake sturgeon. USFWS- n/a	No; Known habitat types are not present within the Project area.
Blanding's turtle/ *Emydoidea blandingii*	T	n/a	This species inhabits marshes, ponds, lakes, streams, wet meadows, and swampy forests. Although essentially aquatic, the Blanding's turtle will travel over land as it moves from one wetland to the next.	No	Due to the location, the type of habitat within the project area, and the type of work proposed, this project is not likely to impact this species.	No; Known habitat types are not present within the Project area.
Spotted turtle/ *Clemmys guttata*	T	n/a	This species prefers fens, bogs and marshes, but also is known to inhabit wet prairies, meadows, pond edges, wet woods, and the shallow sluggish waters of small streams and ditches.	No	Due to the location, the type of habitat within the project area, and the type of work proposed, this project is not likely to impact this species.	No; Known habitat types are not present within the Project area.
American bittern/ *Botaurus lentiginosus*	E	n/a	Nesting bitterns prefer large undisturbed wetlands that have scattered small pools amongst dense vegetation. They occasionally occupy bogs, large wet meadows, and dense shrubby swamps. Nesting avoidance dates- May 1 to July 31.	No	ODNR- If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 to July 31. If this type of habitat will not be impacted, the project is not likely to impact this species. USFWS- n/a	No; Known habitat types are not present within the Project area.

COMMON/ *SCIENTIFIC NAMES*	STATE LISTED STATUS	FEDERALLY LISTED STATUS	TYPICAL HABITAT DESCRIPTION[1]	HABITAT OBSERVED IN SURVEY AREA[2]	AGENCY COMMENT (APPENDIX D)	POTENTIAL IMPACTS AND AVOIDANCE DATES
black-crowned night-heron/ *Nycticorax nycticorax*	T	n/a	Night-herons are nocturnal, conducting most of their foraging in the evening hours or at night, and roost in trees near wetlands and waterbodies during the day. Night herons are migratory and are typically found in Ohio from April 1 through December 1 but can be found in more urbanized areas with reliable food sources year-round. Black-crowned night-herons primarily forage in wetlands and other shallow aquatic habitats, and roost in trees nearby. These night-herons nest in small trees, saplings, shrubs, or sometimes on the ground, near bodies of water and wetlands.	No	ODNR- If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species. USFWS- n/a	No; Known habitat types are not present within the Project area.
lark sparrow/ *Chondestes grammacus*	E	n/a	This secretive marsh species prefers dense emergent wetlands with dense, tall growths of aquatic or semiaquatic vegetation (particularly cattail, sedge, rushes, arrowheads, or sawgrass) interspersed with clumps of woody vegetation and open water. Nests are made from dried vegetation suspended .5 to 2.5 feet above the water. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.	No	ODNR- If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species. USFWS- n/a	No; Known habitat types are not present within the Project area.
Least bittern/ *Ixobrychus exilis*	T	n/a	A marsh species prefers dense emergent wetlands with thick stands of cattails, sedges, sawgrass or other semiaquatic vegetation interspersed with woody vegetation and open water. Nesting avoidance dates- May 1 to July 31.	No	ODNR- If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 to July 31. If this type of habitat will not be impacted, this project is not likely to impact this species. USFWS- n/a	No; Known habitat types are not present within the Project area.

COMMON/ *SCIENTIFIC NAMES*	STATE LISTED STATUS	FEDERALLY LISTED STATUS	TYPICAL HABITAT DESCRIPTION[1]	HABITAT OBSERVED IN SURVEY AREA[2]	AGENCY COMMENT (APPENDIX D)	POTENTIAL IMPACTS AND AVOIDANCE DATES
Northern harrier/ *Circus hudsonis*	E	n/a	This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. Nesting avoidance dates- May 15 to August 1.	No	ODNR-If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 to July 31. If this habitat will not be impacted, this project is not likely to impact this species. USFWS- n/a	No; Known habitat types are not present within the Project area.
Sandhill crane/ *Grus canadensis*	T	n/a	Sandhill cranes are primarily a wetland-dependent species. On their wintering grounds, they will utilize agricultural fields; however, they roost in shallow, standing water or moist bottomlands. On breeding grounds, they require a rather large tract of wet meadow, shallow marsh, or bog for nesting. Nesting avoidance dates- April 1 to September 1.	No	ODNR- If grassland, prairie, or wetland habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 1 to August 31. If this habitat will not be impacted, this project is not likely to have an impact on this species. USFWS- n/a	No; Known habitat types are not present within the Project area.
Trumpeter swan/ *Cygnus buccinator*	T	n/a	Large marshes and lakes ranging in size from 40 to 150 acres. They like shallow wetlands one to three feet deep with a diverse mix of plenty of emergent and submergent vegetation and open water. Nesting avoidance dates- April 15 to June 15.	No	ODNR- If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 to June 15. If this habitat will not be impacted, this project is not likely to have an impact on this species. USFWS- n/a	No; Known habitat types are not present within the Project area.
Upland Sandpiper/ *Bartramia longicauda*	E	n/a	Utilizes dry grasslands, including native grasslands, grazed/ ungrazed pasture hayfields- Nesting avoidance dates- April 15 to July 31.	No	ODNR-If the upland sandpiper habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 to July 31. No impact to this species if habitat is avoided. USFWS- n/a	No; Known habitat types are not present within the Project area.

COMMON/ *SCIENTIFIC NAMES*	STATE LISTED STATUS	FEDERALLY LISTED STATUS	TYPICAL HABITAT DESCRIPTION[1]	HABITAT OBSERVED IN SURVEY AREA[2]	AGENCY COMMENT (APPENDIX D)	POTENTIAL IMPACTS AND AVOIDANCE DATES
Round-leaved dogwood/ *Cornus rugosa*	S	n/a	Round-leaved dogwood is an understory species of upland forest, both hardwood and conifer. Semi-shade tolerant, it prefers thinner canopies or openings and wood margins.	Yes	ODNR- These plants were previously found within the Project footprint. Due to the possible disruption of these species, a pre-construction survey of the proposed project site should be conducted to ensure that the plants and any other rare species within the proposed construction limits are not impacted. If there are any questions about Ohio flora or if survey assistance is required, please contact the Division of Natural Areas and Preserves' Chief Botanist, Rick Gardner at richard.gardner@dnr.ohio.gov	Habitat surveys were completed by a qualified botanist on October 5, 2021. No state-listed plant species were observed at the Project site during the field survey. The habitat survey also determined that the extent and severity of land disturbance and abundance of invasive plant species indicate low potential for *Capnoides sempervirens*, *Cornus rugosa*, and other listed plant species. Results were submitted to ODNR and they concluded that no additional survey work is necessary and the project will not impact any state endangered and threatened plant populations.
Rock harlequin/ *Capnoides sempervirens*	E	n/a	A biennial herb characteristic of rocky habitats, particularly in areas of recent soil disturbance, and is known in Ohio primarily from the Allegheny Plateau region	Yes		

Status key-E=Endangered; T=Threatened; S=Species of Concern; SC=Special Interest P Potentially Threatened Species X Presumed Extirpated Species
**The information is based on the literature review response information from ODNR and USFWS and is study area/project specific-if a different source is approved to be used by the WERS Lead please note.
[1] Habitat descriptions sourced from multiple resources, including Michigan Natural Features Inventory, United States Forest Service, USFWS.
[2] Represents the opinion of POWER biologists based on site conditions at time that aquatic resources delineations were completed.

FIGURE 1 PROJECT LOCATION MAP

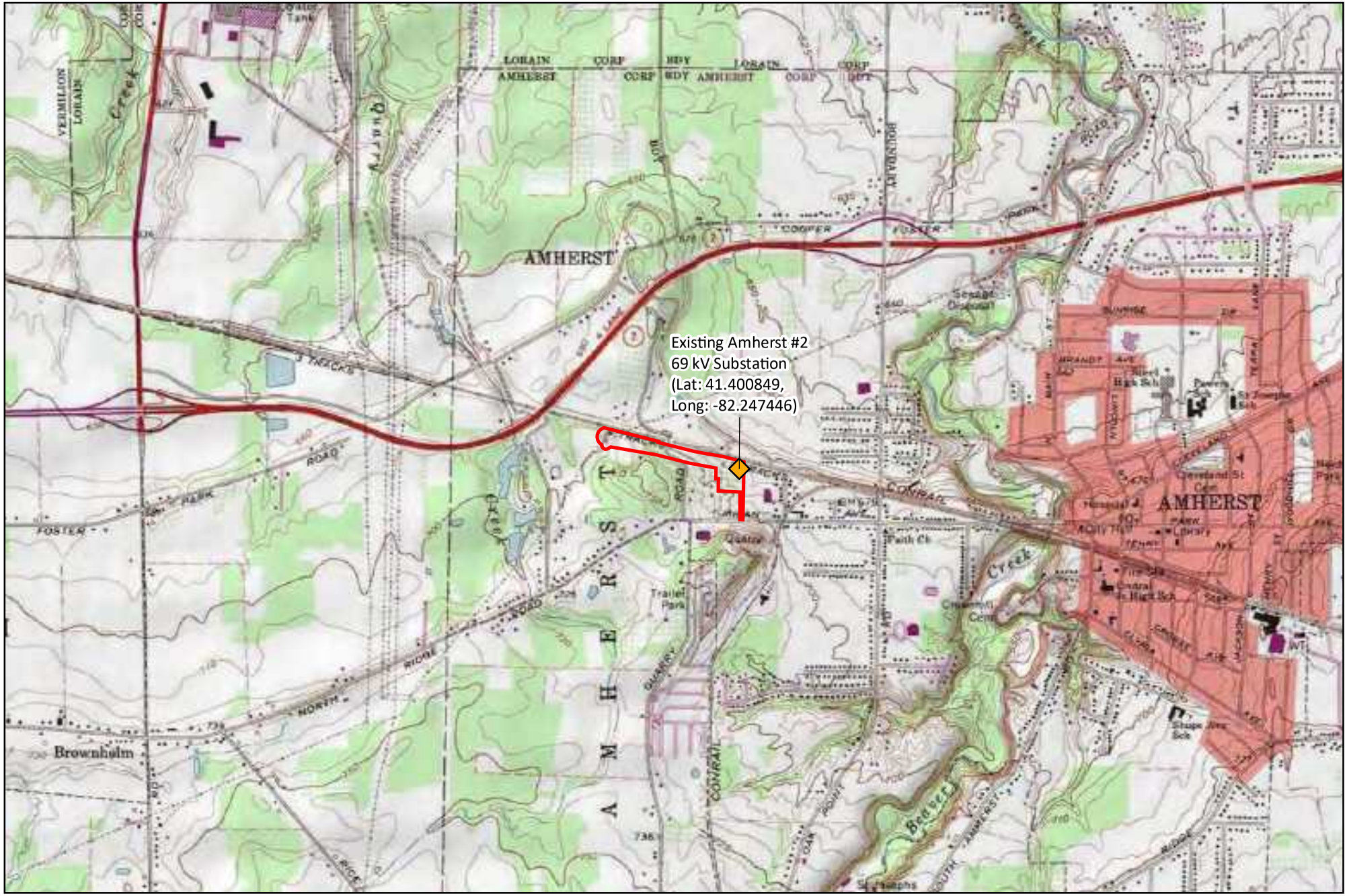


Figure 1
Project Location
Lorain County, Ohio

0 1,000 2,000
Feet

1" = 2,000'

OVERVIEW

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS
AMP TRANSMISSION

Date: 6/4/2021; Author: jhumiston; Project: 167911

FIGURE 2 RESOURCE LOCATION MAP

Existing Amherst Substation

Survey Area

NHD Lake/Pond

NHD Stream/ River

Road

Railroad

Figure 2
Overview
Lorain County, Ohio

0 600 1,200
Feet

1" = 1,200'

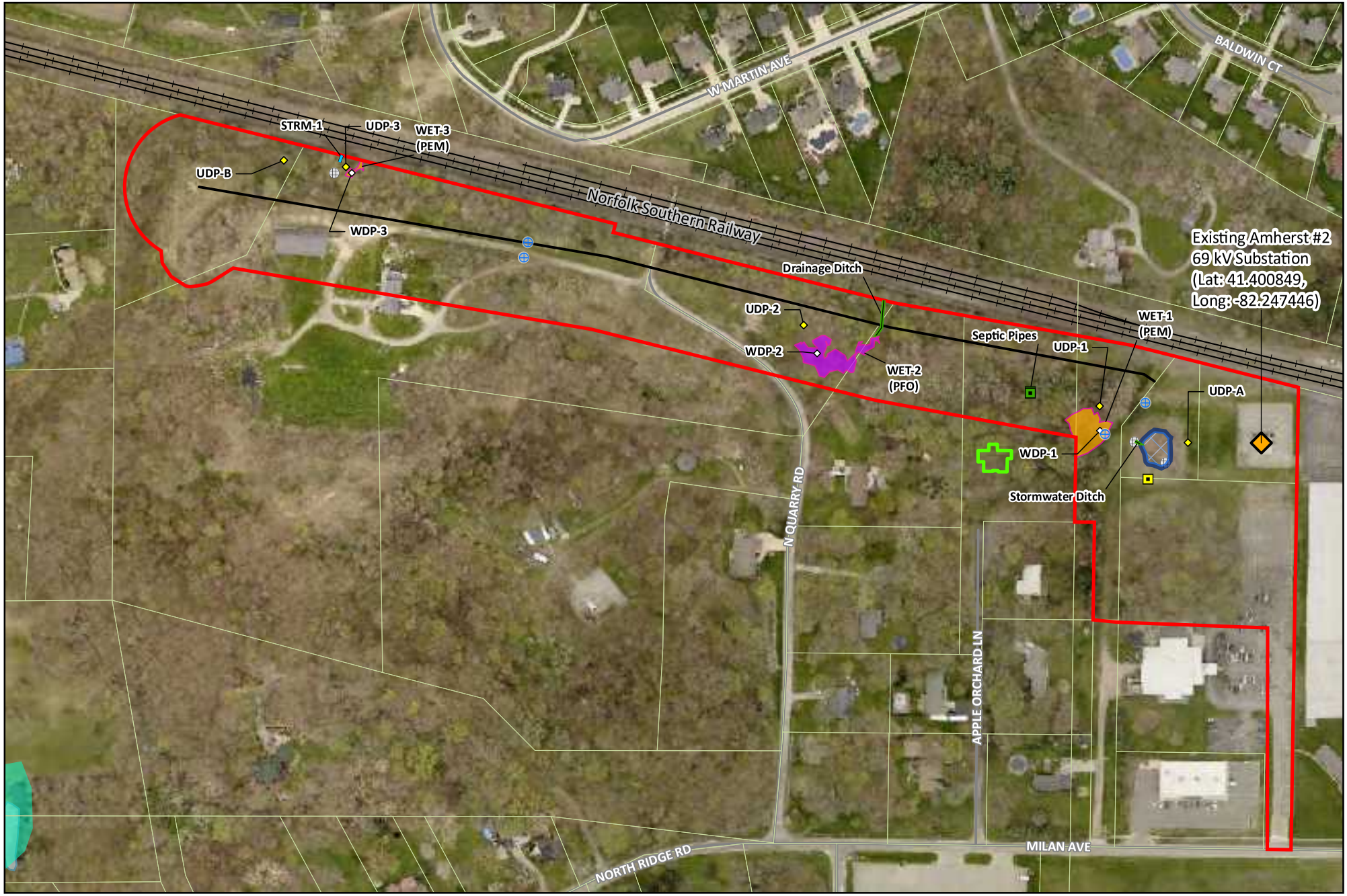
OVERVIEW

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS

AMP TRANSMISSION

Date: 6/4/2021; Author: jhumiston; Project: 167911



Existing Amherst Substation
Proposed Route
Survey Area
Catch Basin
Seep on Slope
Septic Pipe
Culvert
Upland Data Point
Wetland Data Point
Delineated Swale or Drainage Ditch
Delineated Intermittent Stream/Bank
Delineated Wetland (PEM)
Delineated Wetland (PFO)
Stormwater Basin
Railroad
Road
New House
Parcel Boundary
NWI Wetland
NHD Lake/Pond

Figure 2
Resource Location
Lorain County, Ohio

0 250
Feet

1" = 250'
Map 1 of 1

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS
AMP TRANSMISSION

Date: 6/14/2021; Author: jhumiston; Project: 167911

FIGURE 3 LAND USE MAP

Existing Amherst Substation
Parcel Boundary
Survey Area
Young/Second Growth Forest
Herbaceous Upland
High Intensity Development
Mowed Grass
New Field
Residential Area
Road/Driveway Right-of-Way
Road
Railroad

Figure 3
Land Use
Lorain County, Ohio

0 250
Feet

1" = 250'
Map 1 of 1

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS
AMP TRANSMISSION

Date: 6/4/2021; Author: jhumiston; Project: 167911

APPENDIX A PHOTOGRAPHS

PHOTOGRAPHIC RECORD of Aquatic Resources

Site Location: Amherst #2 Substation and Transmission Line Project

Client Name: AMP Transmission, LLC **Date:** May 11, 2021 **Description:** WDP-1 (WET-1); PEM Wetland

Facing North

Facing East

Facing South

Facing West

Overview of Wetland facing Northwest

Overview of Wetland East

PHOTOGRAPHIC RECORD of Aquatic Resources

Site Location: Amherst #2 Substation and Transmission Line Project

Client Name: AMP Transmission, LLC **Date:** May 11, 2021 **Description:** UDP-1; Upland of WET-1

Facing North

Facing East

Facing South

Facing West

PHOTOGRAPHIC RECORD of Aquatic Resources

Site Location: Amherst #2 Substation and Transmission Line Project

Client Name: AMP Transmission, LLC **Date:** May 11, 2021 **Description:** WDP-2 (WET-2); PFO Wetland

Facing North

Facing East

Facing South

Facing West

Overview of Wetland facing Northeast

Overview of drainage south of Wetland facing Northeast

PHOTOGRAPHIC RECORD of Aquatic Resources

Site Location: Amherst #2 Substation and Transmission Line Project

Client Name: AMP Transmission, LLC **Date:** May 11, 2021 **Description:** UDP-2; Upland of WET-2

Facing North

Facing East

Facing South

Facing West

PHOTOGRAPHIC RECORD of Aquatic Resources

Site Location: Amherst #2 Substation and Transmission Line Project

Client Name: AMP Transmission, LLC **Date:** May 11, 2021 **Description:** WDP-3 (WET-3); PEM Wetland

Facing North

Facing East

Facing South

Facing West

Overview of Wetland facing Northeast

Overview of Wetland facing West

PHOTOGRAPHIC RECORD of Aquatic Resources

Site Location: Amherst #2 Substation and Transmission Line Project

Client Name: AMP Transmission, LLC **Date:** May 11, 2021 **Description:** UDP-3; Upland of WET-3

Facing North

Facing East

Facing South

Facing West

PHOTOGRAPHIC RECORD of Aquatic Resources

Site Location: Amherst #2 Substation and Transmission Line Project

Client Name: AMP Transmission, LLC **Date:** May 11, 2021 **Description:** STRM-1; Intermittent Stream

Facing Upstream

Facing Downstream

Facing Upstream

Facing Downstream

View of stream substrate

PHOTOGRAPHIC RECORD of Aquatic Resources

Site Location: Amherst #2 Substation and Transmission Line Project

Client Name: AMP Transmission, LLC **Date:** May 11, 2021 **Description:** UDP-A; Herbaceous upland area

Facing North

Facing East

Facing South

Facing West with view of stormwater basin

Overview of stormwater basin near UDP-A facing Southwest

Overview of substation area near UDP-A (facing Northeast)

PHOTOGRAPHIC RECORD of Aquatic Resources

Site Location: Amherst #2 Substation and Transmission Line Project

Client Name: AMP Transmission, LLC **Date:** May 11, 2021 **Description:** UDP-B; Herbaceous upland area

Facing North

Facing East

Facing South

Facing West

APPENDIX B WETLAND DATA FORMS

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project City/County: Amherst/Lorain County Sampling Date: 05/11/2021
Applicant/Owner: AMP Transmission, LLC State: OH Sampling Point: WDP-1
Investigator(s): Lauren Schirtzinger and Nathan Ehlinger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR R Lat: 41.400919 Long: -82.248632 Datum: WGS 84
Soil Map Unit Name: OtB - Oshtemo sandy loam, 2 to 6 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes **X** No _____ (if no, explain in Remarks.)
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X**	No _____	**Is the Sampled Area within a Wetland?** Yes **X** No _____
Hydric Soil Present?	Yes **X**	No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes **X**	No _____	

Remarks: (Explain alternative procedures here or in a separate report.)
This point was determined to be within a wetland due to the presence of all three wetland criteria.

PEM Wetland

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___	Surface Water (A1)	**X**	Water-Stained Leaves (B9)
___	High Water Table (A2)	___	Aquatic Fauna (B13)
___	Saturation (A3)	___	Marl Deposits (B15)
___	Water Marks (B1)	___	Hydrogen Sulfide Odor (C1)
___	Sediment Deposits (B2)	**X**	Oxidized Rhizospheres on Living Roots (C3)
___	Drift Deposits (B3)	___	Presence of Reduced Iron (C4)
___	Algal Mat or Crust (B4)	___	Recent Iron Reduction in Tilled Soils (C6)
___	Iron Deposits (B5)	___	Thin Muck Surface (C7)
___	Inundation Visible on Aerial Imagery (B7)	___	Other (Explain in Remarks)
___	Sparsely Vegetated Concave Surface (B8)		

Secondary Indicators (minimum of two required)

___	Surface Soil Cracks (B6)
___	Drainage Patterns (B10)
___	Moss Trim Lines (B16)
___	Dry-Season Water Table (C2)
___	Crayfish Burrows (C8)
___	Saturation Visible on Aerial Imagery (C9)
___	Stunted or Stressed Plants (D1)
X	Geomorphic Position (D2)
___	Shallow Aquitard (D3)
___	Microtopographic Relief (D4)
X	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No **X**	Depth (inches): _____
Water Table Present?	Yes _____	No **X**	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No **X**	Depth (inches): _____

Wetland Hydrology Present? Yes **X** No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

VEGETATION - Use scientific names of plants.

Sampling Point: **WDP-1**

Tree Stratum (Plot size: 30 feet)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5 feet)			
1. *Poa trivialis*	60	Yes	FACW
2. *Juncus effusus*	20	No	OBL
3. *Carex blanda*	18	No	FAC
4. *Carex vulpinoidea*	15	No	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	113.00 = Total Cover		

Woody Vine Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	**35**	x 1 =	**35**
FACW species	**60**	x 2 =	**120**
FAC species	**18**	x 3 =	**54**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**113** (A)		**209** (B)

Prevalence Index = B/A = **1.85**

Hydrophytic Vegetation Indicators:

- **X** 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

SOIL

Sampling Point: **WDP-1**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	90	5YR 4/4	10	C	M	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ____ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ____ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ____ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- **X** Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ____ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ____ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ____ Dark Surface (S7) **(LRR K, L, M)**
- ____ Polyvalue Below Surface (S8) **(LRR K, L)**
- ____ Thin Dark Surface (S9) **(LRR K, L)**
- ____ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ____ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ____ Red Parent Material (F21)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: n/a

Depth (inches): ____

Hydric Soil Present? Yes X No ____

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project City/County: Amherst/Lorain County Sampling Date: 05/11/2021
Applicant/Owner: AMP Transmission, LLC State: OH Sampling Point: WDP-2
Investigator(s): Lauren Schirtzinger and Nathan Ehlinger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR R Lat: 41.401352 Long: -82.250710 Datum: WGS 84
Soil Map Unit Name: OtB - Oshtemo sandy loam, 2 to 6 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes **X** No _____ (if no, explain in Remarks.)
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X**	No _____	**Is the Sampled Area within a Wetland?**	**Yes X** **No** _____
Hydric Soil Present?	Yes **X**	No _____		
Wetland Hydrology Present?	Yes **X**	No _____	If yes, optional Wetland Site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)
This point was determined to be within a wetland due to the presence of all three wetland criteria.

PEM Wetland

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- **X** Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- **X** Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- **X** Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- **X** FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No **X**	Depth (inches): _____
Water Table Present?	Yes _____	No **X**	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No **X**	Depth (inches): _____

Wetland Hydrology Present? **Yes X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

VEGETATION - Use scientific names of plants.

Sampling Point: **WDP-2**

Tree Stratum (Plot size: 30 feet)	Absolute % cover	Dominant Species?	Indicator Status
1. *Platanus occidentalis*	30	Yes	FACW
2. *Quercus palustris*	25	Yes	FACW
3. *Acer saccharum*	10	No	FACU
4. *Ulmus americana*	10	No	FACW
5. *Acer rubrum*	10	No	FAC
6. *Fraxinus pennsylvanica*	5	No	FACW
7.			
	90	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	

Herb Stratum (Plot size: 5 feet)			
1. *Impatiens capensis*	5	Yes	FACW
2. *Acer rubrum*	2	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	7.00	= Total Cover	

Woody Vine Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **4** (A)

Total Number of Dominant Species Across All Strata: **4** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**75**	x 2 =	**150**
FAC species	**12**	x 3 =	**36**
FACU species	**10**	x 4 =	**40**
UPL species	**0**	x 5 =	**0**
Column Totals:	**97** (A)		**226** (B)

Prevalence Index = B/A = **2.33**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

SOIL

Sampling Point: **WDP-2**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	95	5YR 4/4	5	C	PL/M	Sandy Loam	
12-16	10YR 3/1	80	5YR 4/4	10	C	M	Sandy Loam	
			10YR 6/4	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ____ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ____ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ____ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- **X** Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ____ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ____ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ____ Dark Surface (S7) **(LRR K, L, M)**
- ____ Polyvalue Below Surface (S8) **(LRR K, L)**
- ____ Thin Dark Surface (S9) **(LRR K, L)**
- ____ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ____ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ____ Red Parent Material (F21)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: n/a

Depth (inches): ____

Hydric Soil Present? Yes X No ____

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project City/County: Amherst/Lorain County Sampling Date: 05/11/2021
Applicant/Owner: AMP Transmission, LLC State: OH Sampling Point: WDP-3
Investigator(s): Lauren Schirtzinger and Nathan Ehlinger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR R Lat: 41.402358 Long: -82.254127 Datum: WGS 84
Soil Map Unit Name: Qu - Quarries NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes **X** No _____ (if no, explain in Remarks.)
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No** ,Soil **Yes** ,or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X**	No _____	**Is the Sampled Area within a Wetland?**	**Yes X** **No** _____
Hydric Soil Present?	Yes **X**	No _____		
Wetland Hydrology Present?	Yes **X**	No _____	If yes, optional Wetland Site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)
This point was determined to be within a wetland due to the presence of all three wetland criteria.

PEM Wetland

Impacted by railroad ROW

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- **X** High Water Table (A2)
- **X** Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- **X** Sparsely Vegetated Concave Surface (B8)
- **X** Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- **X** Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- **X** FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No **X**	Depth (inches): _____
Water Table Present?	Yes **X**	No _____	Depth (inches): **3**
Saturation Present? (includes capillary fringe)	Yes **X**	No _____	Depth (inches): **0**

Wetland Hydrology Present? **Yes X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

VEGETATION - Use scientific names of plants.

Sampling Point: **WDP-3**

Tree Stratum (Plot size: 30 feet)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5 feet)			
1. *Impatiens capensis*	15	Yes	FACW
2. *Equisetum arvense*	8	Yes	FAC
3. *Toxicodendron radicans*	5	No	FAC
4. *Rosa multiflora*	3	No	FACU
5. *Fraxinus pennsylvanica*	2	No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	33.00 = Total Cover		

Woody Vine Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **2** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**17**	x 2 =	**34**
FAC species	**13**	x 3 =	**39**
FACU species	**3**	x 4 =	**12**
UPL species	**0**	x 5 =	**0**
Column Totals:	**33** (A)		**85** (B)

Prevalence Index = B/A = **2.58**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

SOIL

Sampling Point: **WDP-3**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/1	100					Muck	
2-14	10YR 4/1	95	10YR 5/6	5	C	M	Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- **X** Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ____ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ____ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ____ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- **X** 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ____ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ____ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ____ Dark Surface (S7) **(LRR K, L, M)**
- ____ Polyvalue Below Surface (S8) **(LRR K, L)**
- ____ Thin Dark Surface (S9) **(LRR K, L)**
- ____ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ____ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ____ Red Parent Material (F21)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 14

Hydric Soil Present? **Yes** **X** **No** ____

Remarks:

A positive indication of hydric soil was observed.

APPENDIX C UPLAND DATA FORMS

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project City/County: Amherst/Lorain County Sampling Date: 05/11/2021
Applicant/Owner: AMP Transmission, LLC State: OH Sampling Point: UDP-1
Investigator(s): Lauren Schirtzinger and Nathan Ehlinger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Footslope Local relief (concave, convex, none): None Slope (%): 0-1
Subregion (LRR or MLRA): LRR R Lat: 41.401056 Long: -82.248634 Datum: WGS 84
Soil Map Unit Name: OtB - Oshtemo sandy loam, 2 to 6 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes **X** No _____ (if no, explain in Remarks.)
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No **X**	**Is the Sampled Area within a Wetland?**	**Yes** _____ **No** **X**
Hydric Soil Present?	Yes _____	No **X**		
Wetland Hydrology Present?	Yes _____	No **X**	If yes, optional Wetland Site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)
This point was determined not to be within a wetland due to the lack of all three wetland criteria.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____ No **X**	Depth (inches): _____	
Water Table Present?	Yes _____ No **X**	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes _____ No **X**	Depth (inches): _____	**Wetland Hydrology Present?** **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION - Use scientific names of plants.

Sampling Point: **UDP-1**

Tree Stratum (Plot size: 30 feet)	Absolute % cover	Dominant Species?	Indicator Status
1. *Prunus serotina*	70	Yes	FACU
2. *Picea abies*	15	No	UPL
3. *Acer saccharum*	10	No	FACU
4.			
5.			
6.			
7.			
	95	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Lonicera maackii*	7	Yes	UPL
2. *Rosa multiflora*	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	17	= Total Cover	

Herb Stratum (Plot size: 5 feet)			
1. *Viburnum opulus*	12	Yes	FACW
2. *Galium aparine*	10	Yes	FACU
3. *Onoclea sensibilis*	8	No	FACW
4. *Toxicodendron radicans*	5	No	FAC
5. *Alliaria petiolata*	5	No	FACU
6. *Lonicera japonica*	3	No	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	43.00	= Total Cover	

Woody Vine Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **5** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **20%** (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**	
FACW species	**20**	x 2 =	**40**	
FAC species	**5**	x 3 =	**15**	
FACU species	**108**	x 4 =	**432**	
UPL species	**22**	x 5 =	**110**	
Column Totals:	**155**	(A)	**597**	(B)

Prevalence Index = B/A = **3.85**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **UDP-1**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	None	—	—	—	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ____ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ____ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ____ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ____ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ____ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ____ Dark Surface (S7) **(LRR K, L, M)**
- ____ Polyvalue Below Surface (S8) **(LRR K, L)**
- ____ Thin Dark Surface (S9) **(LRR K, L)**
- ____ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ____ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ____ Red Parent Material (F21)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ____

Hydric Soil Present? Yes ____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project City/County: Amherst/Lorain County Sampling Date: 05/11/2021
Applicant/Owner: AMP Transmission, LLC State: OH Sampling Point: UDP-2
Investigator(s): Lauren Schirtzinger and Nathan Ehlinger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Convex Slope (%): 2-5
Subregion (LRR or MLRA): LRR R Lat: 41.401509 Long: -82.250808 Datum: WGS 84
Soil Map Unit Name: OtB - Oshtemo sandy loam, 2 to 6 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes **X** No _____ (if no, explain in Remarks.)
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No **X**	**Is the Sampled Area within a Wetland?**	**Yes** _____ **No** **X**
Hydric Soil Present?	Yes _____	No **X**		
Wetland Hydrology Present?	Yes _____	No **X**	If yes, optional Wetland Site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)
This point was determined not to be within a wetland due to the lack of all three wetland criteria.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____ No **X**	Depth (inches): _____	
Water Table Present?	Yes _____ No **X**	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes _____ No **X**	Depth (inches): _____	**Wetland Hydrology Present?** **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION - Use scientific names of plants.

Sampling Point: **UDP-2**

Tree Stratum (Plot size: 30 feet)	Absolute % cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	50	Yes	FACU
2. *Acer saccharum*	35	Yes	FACU
3. *Fraxinus pennsylvanica*	15	No	FACW
4. *Populus tremuloides*	10	No	FACU
5.			
6.			
7.			
	110	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Rosa multiflora*	8	Yes	FACU
2. *Fraxinus pennsylvanica*	5	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	13	= Total Cover	

Herb Stratum (Plot size: 5 feet)			
1. *Lonicera japonica*	35	Yes	FACU
2. *Impatiens capensis*	10	Yes	FACW
3. *Parthenocissus quinquefolia*	9	No	FACU
4. *Rosa multiflora*	8	No	FACU
5. *Alliaria petiolata*	6	No	FACU
6. *Galium aparine*	5	No	FACU
7. *Quercus rubra*	3	No	FACU
8.			
9.			
10.			
11.			
12.			
	76.00	= Total Cover	

Woody Vine Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **2** (A)

Total Number of Dominant Species Across All Strata: **6** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **33%** (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**	
FACW species	**30**	x 2 =	**60**	
FAC species	**0**	x 3 =	**0**	
FACU species	**169**	x 4 =	**676**	
UPL species	**0**	x 5 =	**0**	
Column Totals:	**199**	(A)	**736**	(B)

Prevalence Index = B/A = **3.70**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **UDP-2**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-5	10YR 3/2	100	None	—	—	—	Sandy Loam	
5-16	10YR 3/3	100	None	—	—	—	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ____ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ____ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ____ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ____ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ____ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ____ Dark Surface (S7) **(LRR K, L, M)**
- ____ Polyvalue Below Surface (S8) **(LRR K, L)**
- ____ Thin Dark Surface (S9) **(LRR K, L)**
- ____ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ____ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ____ Red Parent Material (F21)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ____

Hydric Soil Present? Yes ____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project City/County: Amherst/Lorain County Sampling Date: 05/11/2021
Applicant/Owner: AMP Transmission, LLC State: OH Sampling Point: UDP-3
Investigator(s): Lauren Schirtzinger and Nathan Ehlinger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Backslope Local relief (concave, convex, none): None Slope (%): 2-5
Subregion (LRR or MLRA): LRR R Lat: 41.402392 Long: -82.254170 Datum: WGS 84
Soil Map Unit Name: Qu - Quarries NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes **X** No _____ (if no, explain in Remarks.)
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No **X**	**Is the Sampled Area within a Wetland?**	**Yes** _____ **No** **X**
Hydric Soil Present?	Yes _____	No **X**		
Wetland Hydrology Present?	Yes _____	No **X**	If yes, optional Wetland Site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)
This point was determined not to be within a wetland due to the lack of all three wetland criteria.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____ No **X**	Depth (inches): _____	
Water Table Present?	Yes _____ No **X**	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes _____ No **X**	Depth (inches): _____	**Wetland Hydrology Present?** **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION - Use scientific names of plants.

Sampling Point: **UDP-3**

Tree Stratum (Plot size: 30 feet)	Absolute % cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	35	Yes	FACU
2. *Acer rubrum*	15	Yes	FAC
3. *Fraxinus pennsylvanica*	10	No	FACW
4.			
5.			
6.			
7.			
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Fraxinus pennsylvanica*	10	Yes	FACW
2. *Lindera benzoin*	5	Yes	FACW
3. *Rosa multiflora*	5	Yes	FACU
4. *Tilia americana*	3	No	FACU
5.			
6.			
7.			
	23	= Total Cover	

Herb Stratum (Plot size: 5 feet)			
1. *Rosa multiflora*	25	Yes	FACU
2. *Toxicodendron radicans*	15	Yes	FAC
3. *Galium aparine*	10	Yes	FACU
4. *Parthenocissus quinquefolia*	10	Yes	FACU
5. *Equisetum arvense*	8	No	FAC
6. *Galium triflorum*	7	No	FACU
7. *Onoclea sensibilis*	5	No	FACW
8. *Lindera benzoin*	5	No	FACW
9. *Dryopteris cristata*	3	No	OBL
10.			
11.			
12.			
	88.00	= Total Cover	

Woody Vine Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **4** (A)

Total Number of Dominant Species Across All Strata: **9** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **44%** (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	**3**	x 1 =	**3**	
FACW species	**35**	x 2 =	**70**	
FAC species	**38**	x 3 =	**114**	
FACU species	**95**	x 4 =	**380**	
UPL species	**0**	x 5 =	**0**	
Column Totals:	**171**	(A)	**567**	(B)

Prevalence Index = B/A = **3.32**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **UDP-3**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/3	80	10YR 6/8	20	C	M	Sand	Gravel in layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ____ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ____ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ____ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ____ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ____ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ____ Dark Surface (S7) **(LRR K, L, M)**
- ____ Polyvalue Below Surface (S8) **(LRR K, L)**
- ____ Thin Dark Surface (S9) **(LRR K, L)**
- ____ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ____ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ____ Red Parent Material (F21)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 4

Hydric Soil Present? Yes ____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project City/County: Amherst/Lorain County Sampling Date: 05/11/2021
Applicant/Owner: AMP Transmission, LLC State: OH Sampling Point: UDP-A
Investigator(s): Lauren Schirtzinger and Nathan Ehlinger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Backslope Local relief (concave, convex, none): None Slope (%): 2-5
Subregion (LRR or MLRA): LRR R Lat: 41.400852 Long: -82.247986 Datum: WGS 84
Soil Map Unit Name: JsA - Jimtown sandy loam, 0 to 2 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes **X** No _____ (if no, explain in Remarks.)
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No **X**	**Is the Sampled Area within a Wetland?** Yes _____ No **X**
Hydric Soil Present?	Yes _____	No **X**	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes _____	No **X**	

Remarks: (Explain alternative procedures here or in a separate report.)
This point was determined not to be within a wetland due to the lack of all three wetland criteria.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No **X**	Depth (inches): _____
Water Table Present?	Yes _____	No **X**	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No **X**	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION - Use scientific names of plants.

Sampling Point: **UDP-A**

Tree Stratum (Plot size: 30 feet)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5 feet)			
1. *Poa pratensis*	30	Yes	FACU
2. *Poa annua*	20	Yes	FACU
3. *Melilotus officinalis*	15	Yes	FACU
4. *Plantago lanceolata*	15	Yes	FACU
5. *Trifolium repens*	10	No	FACU
6. *Lamium purpureum*	5	No	UPL
7. *Taraxacum officinale*	5	No	FACU
8.			
9.			
10.			
11.			
12.			
	100.00 = Total Cover		

Woody Vine Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **4** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**95**	x 4 =	**380**
UPL species	**5**	x 5 =	**25**
Column Totals:	**100** (A)		**405** (B)

Prevalence Index = B/A = **4.05**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **UDP-A**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/2	55	10YR 5/8	5	C	M	Sandy Loam	
			10YR 3/3	40	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ____ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ____ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ____ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ____ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ____ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ____ Dark Surface (S7) **(LRR K, L, M)**
- ____ Polyvalue Below Surface (S8) **(LRR K, L)**
- ____ Thin Dark Surface (S9) **(LRR K, L)**
- ____ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ____ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ____ Red Parent Material (F21)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ____

Hydric Soil Present? Yes ____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project City/County: Amherst/Lorain County Sampling Date: 05/11/2021
Applicant/Owner: AMP Transmission, LLC State: OH Sampling Point: UDP-B
Investigator(s): Lauren Schirtzinger and Nathan Ehlinger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-1
Subregion (LRR or MLRA): LRR R Lat: 41.402429 Long: -82.254627 Datum: WGS 84
Soil Map Unit Name: Qu - Quarries NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes **X** No _____ (if no, explain in Remarks.)
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No **X**	**Is the Sampled Area within a Wetland?**	**Yes** _____ **No** **X**
Hydric Soil Present?	Yes _____	No **X**		
Wetland Hydrology Present?	Yes _____	No **X**	If yes, optional Wetland Site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)
This point was determined not to be within a wetland due to the lack of all three wetland criteria.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____ No **X**	Depth (inches): _____	
Water Table Present?	Yes _____ No **X**	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes _____ No **X**	Depth (inches): _____	**Wetland Hydrology Present?** **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION - Use scientific names of plants.

Sampling Point: **UDP-B**

Tree Stratum (Plot size: 30 feet)	Absolute % cover	Dominant Species?	Indicator Status
1. *Acer saccharum*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5 feet)			
1. *Podophyllum peltatum*	15	Yes	FACU
2. *Galium aparine*	10	Yes	FACU
3. *Alliaria petiolata*	6	No	FACU
4. *Rosa multiflora*	3	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	34.00 = Total Cover		

Woody Vine Stratum (Plot size: 15 feet)			
1. *None Observed*			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **3** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**44**	x 4 =	**176**
UPL species	**0**	x 5 =	**0**
Column Totals:	**44** (A)		**176** (B)

Prevalence Index = B/A = **4.00**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **UDP-B**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR 2/1	100	None	—	—	—	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ____ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ____ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ____ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ____ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ____ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ____ Dark Surface (S7) **(LRR K, L, M)**
- ____ Polyvalue Below Surface (S8) **(LRR K, L)**
- ____ Thin Dark Surface (S9) **(LRR K, L)**
- ____ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ____ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ____ Red Parent Material (F21)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 3

Hydric Soil Present? Yes ____ No X

Remarks:

No positive indication of hydric soils was observed.

APPENDIX D ORAM FORMS

Background Information

Name:	Lauren Schirtzinger
Date:	05/11/2021
Affiliation:	POWER Engineers, Inc.
Address:	6530 W. Campus Oval Road, 2nd Floor, Suite 200, New Albany, OH 43054
Phone Number:	614-582-6481
e-mail address:	Lauren.Schirtzinger@powereng.com
Name of Wetland:	WET-1
Vegetation Communit(ies):	Palustrine Emergent
HGM Class(es):	Depressional

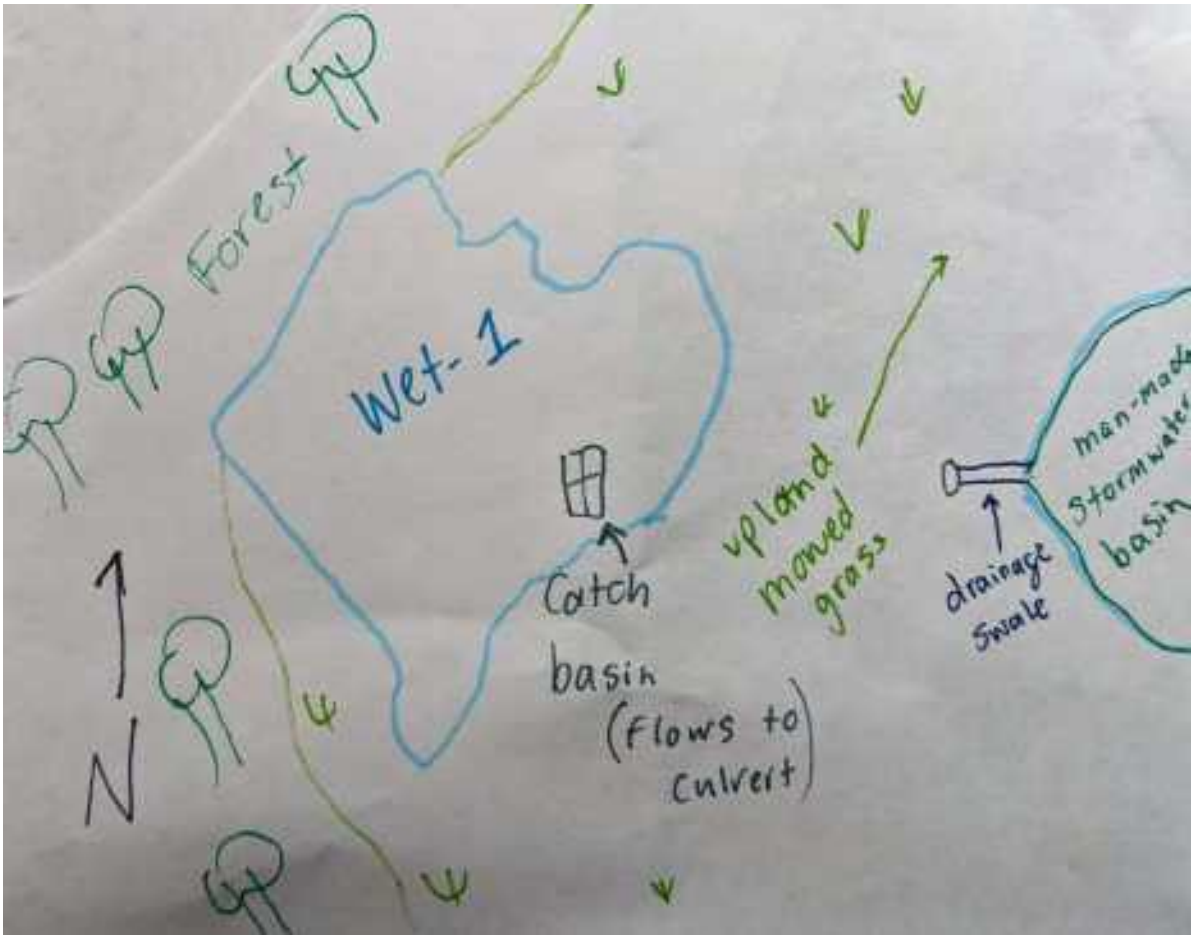
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.

Please see Ecological Report

Lat/Long or UTM Coordinate	41.400917, -82.248724
USGS Quad Name	Vermilion East
County	Lorain County
Township	Amherst
Section and Subsection	N/A
Hydrologic Unit Code	0411001
Site Visit	05/11/2021
National Wetland Inventory Map	Non-wetland
Ohio Wetland Inventory Map	No
Soil Survey	OtB - Oshtemo sandy loam, 2 to 6 percent slopes
Delineation report/map	Amherst #2 Substation and Transmission Line Project-Ecological Survey Report

Name of Wetland: WET-1	
Wetland Size (acres, hectares): 0.13-acre	

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.



Comments, Narrative Discussion, Justification of Category Changes:

Dominant vegetation in WET-1 included common woodland sedge (Carex blanda), fox sedge (Carex vulpinoidea), and rough bluestem (Poa trivialis).

Indicators of hydrology included water-stained leaves, oxidized rhizospheres, geomorphic position, and FAC-neutral test.

The indicator for hydric soil was redox dark surface.

Final score :	17	**Category:**	1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland*. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	X
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.		X

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	**Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	**Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	**Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	**Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	**Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	**Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	**"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	**Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	**Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project	Lauren Schirtzinger	Date: 5/11/2021

Metric 1. Wetland Area (size).

1 (max 6 pts.) | 1 (subtotal)

Select one size class and assign score.

	>50 acres (>20.2ha) (6 pts)
	25 to <50 acres (10.1 to <20.2ha) (5 pts)
	10 to <25 acres (4 to <10.1 ha) (4 pts)
	3 to <10 acres (1.2 to <4 ha) (3 pts)
	0.3 to < 3 acres (012 to <1.2ha) (2 pts)
X	0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
	<0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

5 (max 14 pts.) | 6 (subtotal)

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

	WIDE. Buffers average 50m (164 ft) or more around wetland perimeter (7)
	MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
X	NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
	VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

	VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
X	LOW. Old field (>10 years), shrubland, young second growth forest. (5)
X	MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
	HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

4 (max 30 pts.) | 10 (subtotal)

3a. Sources of Water. Score all that apply.

	High pH groundwater (5)
	Other groundwater (3)
X	Precipitation (1)
	Seasonal/Intermittent surface water (3)
	Perennial surface water (lake or stream (5)

3b. Connectivity. Score all that apply.

	100 year floodplain (1)
	Between stream/lake and other human use (1)
	Part of wetland/upland (e.g. forest), complex (1)
	Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

	>0.7 (27.6in) (3)
	0.4 to 0.7m (15.7 to 27.6in) (2)
X	<0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

	Semi- to permanently inundated/saturated (4)
	Regularly inundated/saturated (3)
	Seasonally inundated (2)
X	Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

	None or none apparent (12)
	Recovered (7)
	Recovering (3)
X	Recent or no recovery (1)

Check all disturbances observed

	ditch		point source (nonstormwater)
	tile	X	filling/grading
	dike		road bed/RR track
	weir	X	dredging
	stormwater input		Other

Metric 4. Habitat Alternation and Development.

5 (max 20 pts.) | 15 (subtotal)

4a. Substrate disturbance. Score one or double check and average.

	None or none apparent (4)
	Recovered (3)
X	Recovering (2)
	Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

	Excellent (7)
	Very good (6)
	Good (5)
	Moderately good (4)
	Fair (3)
X	Poor to fair (2)
	Poor (1)

4c. Habitat alteration. Score one or double check and average.

	None or none apparent (9)
	Recovered (6)
	Recovering (3)
X	Recent or no recovery (1)

Check all disturbances observed

X	mowing	X	shrub/sapling removal
	grazing		herbaceous/aquatic bed removal
X	clearcutting		sedimentation
	selective cutting		dredging
X	woody debris removal		farming
	toxic pollutants		nutrient enrichment

15 subtotal this page

Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project	Lauren Schirtzinger	Date: 5/11/2021

15
subtotal first page

Metric 5. Special Wetlands.

0 (max 10 pts.) | 15 (subtotal)

Check all that apply and score as indicated.

	Bog (10)
	Fen (10)
	Old growth forest (10)
	Mature forested wetland (5)
	Lake Erie coastal/tributary wetland -unrestricted hydrology (10)
	Lake Erie coastal/tributary wetland-restricted hydrology (5)
	Lake Plain Sand Prairies (Oak Openings) (10)
	Relict Wet Prairies (10)
	Known occurrence state/federal threatened or endangered species (10)
	Significant migratory songbird/water fowl habitat or usage (10)
	Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

2 (max 20 pts.) | 17 (subtotal)

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

	Aquatic bed
1	Emergent
	Shrub
	Forest
	Mudflats
	Open Water
	Other_____

6b. Horizontal (plan view) Interspersion.
Score only one.

	High (5)
	Moderately high (4)
	Moderate (3)
	Moderately low (2)
	Low (1)
X	None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage.

	Extensive >75% cover (-5)
	Moderate 25-75% cover (-3)
	Sparse 5-25% cover (-1)
	Nearly absent <5% cover (0)
X	Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

0	Vegetated hummucks/tussucks
0	Coarse woody debris >15cm (6in)
0	Standing dead >25cm (10in) dbh
0	Amphibian breeding pools

Vegatation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality.
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality.

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened, or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present in very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

17 GRAND TOTAL (max 100 pts)

Refer to the most recent ORAM score calibration report for the scoring breakpoints between categories at the following address: http://epa.state.oh.us/dsw/401/401.html

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES (NO)	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES (NO)	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES (NO)	If yes, Category 3.
	Question 4. Significant bird habitat	YES (NO)	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES (NO)	If yes, Category 1.
	Question 6. Bogs	YES (NO)	If yes, Category 3.
	Question 7. Fens	YES (NO)	If yes, Category 3.
	Question 8a. Old Growth Forest	YES (NO)	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES (NO)	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES (NO)	If yes, Category 3
	Question 11. Relict Wet Prairies	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	1	
	Metric 2. Buffers and surrounding land use	5	
	Metric 3. Hydrology	4	
	Metric 4. Habitat	5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	2	
	TOTAL SCORE	17	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

WET-1

	Final Category		
Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name:	Lauren Schirtzinger
Date:	05/11/2021
Affiliation:	POWER Engineers, Inc.
Address:	6530 W. Campus Oval Road, 2nd Floor, Suite 200, New Albany, OH 43054
Phone Number:	614-582-6481
e-mail address:	Lauren.Schirtzinger@powereng.com
Name of Wetland:	WET-2
Vegetation Communit(ies):	Palustrine Forested
HGM Class(es):	Depressional

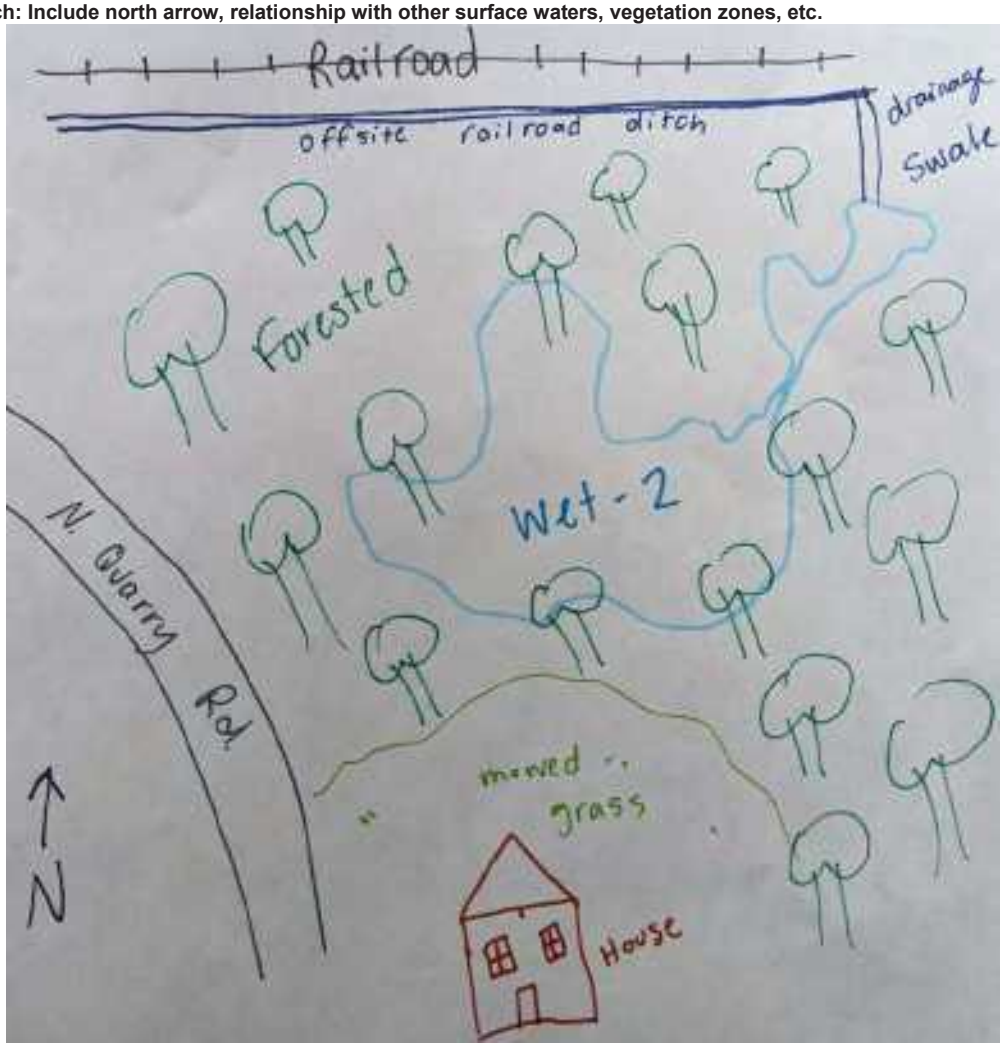
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.

Please see Ecological Report

Lat/Long or UTM Coordinate	41.401335 -82.250611
USGS Quad Name	Vermilion East
County	Lorain County
Township	Amherst
Section and Subsection	N/A
Hydrologic Unit Code	0411001
Site Visit	05/11/2021
National Wetland Inventory Map	Non-wetland
Ohio Wetland Inventory Map	No
Soil Survey	OtB - Oshtemo sandy loam, 2 to 6 percent slopes
Delineation report/map	Amherst #2 Substation and Transmission Line Project-Ecological Survey Report

Name of Wetland: WET-2	
Wetland Size (acres, hectares): 0.13-acre	

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.



Comments, Narrative Discussion, Justification of Category Changes:

Dominant vegetation in WET-2 included: spotted jewelweed (Impatiens capensis), red maple (Acer rubrum), American sycamore (Platanus occidentalis), and pin oak (Quercus palustris).

Indicators of hydrology included drift deposits, water-stained leaves, drainage patterns, and FAC-neutral test.

The indicator for hydric soil was redox dark surface.

Final score :	37	**Category:**	Modified 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland*. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	X
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.		X

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	**Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	**Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	**Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	**Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	**Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	**Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	**"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	**Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	**Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project	Lauren Schirtzinger	Date: 5/11/2021

Metric 1. Wetland Area (size).

1 (max 6 pts.) | 1 (subtotal)

Select one size class and assign score.

	>50 acres (>20.2ha) (6 pts)
	25 to <50 acres (10.1 to <20.2ha) (5 pts)
	10 to <25 acres (4 to <10.1 ha) (4 pts)
	3 to <10 acres (1.2 to <4 ha) (3 pts)
	0.3 to < 3 acres (012 to <1.2ha) (2 pts)
X	0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
	<0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

8 (max 14 pts.) | 9 (subtotal)

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

	WIDE. Buffers average 50m (164 ft) or more around wetland perimeter (7)
X	MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
	NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
	VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

	VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
X	LOW. Old field (>10 years), shrubland, young second growth forest. (5)
X	MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
	HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

11 (max 30 pts.) | 20 (subtotal)

3a. Sources of Water. Score all that apply.

	High pH groundwater (5)
	Other groundwater (3)
X	Precipitation (1)
	Seasonal/Intermittent surface water (3)
	Perennial surface water (lake or stream (5)

3b. Connectivity. Score all that apply.

	100 year floodplain (1)
	Between stream/lake and other human use (1)
X	Part of wetland/upland (e.g. forest), complex (1)
	Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

	>0.7 (27.6in) (3)
	0.4 to 0.7m (15.7 to 27.6in) (2)
X	<0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

	Semi- to permanently inundated/saturated (4)
	Regularly inundated/saturated (3)
	Seasonally inundated (2)
X	Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

	None or none apparent (12)
X	Recovered (7)
	Recovering (3)
	Recent or no recovery (1)

Check all disturbances observed

	ditch		point source (nonstormwater)
	tile		filling/grading
	dike	X	road bed/RR track
	weir		dredging
	stormwater input		Other

Metric 4. Habitat Alternation and Development.

13 (max 20 pts.) | 33 (subtotal)

4a. Substrate disturbance. Score one or double check and average.

X	None or none apparent (4)
	Recovered (3)
	Recovering (2)
	Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

	Excellent (7)
	Very good (6)
	Good (5)
	Moderately good (4)
X	Fair (3)
	Poor to fair (2)
	Poor (1)

4c. Habitat alteration. Score one or double check and average.

	None or none apparent (9)
X	Recovered (6)
	Recovering (3)
	Recent or no recovery (1)

Check all disturbances observed

	mowing	X	shrub/sapling removal
	grazing		herbaceous/aquatic bed removal
	clearcutting		sedimentation
	selective cutting		dredging
	woody debris removal		farming
	toxic pollutants		nutrient enrichment

33 (subtotal this page)

Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project	Lauren Schirtzinger	Date: 5/11/2021

33
subtotal first page

Metric 5. Special Wetlands.

0 (max 10 pts.) | 33 (subtotal)

Check all that apply and score as indicated.

	Bog (10)
	Fen (10)
	Old growth forest (10)
	Mature forested wetland (5)
	Lake Erie coastal/tributary wetland -unrestricted hydrology (10)
	Lake Erie coastal/tributary wetland-restricted hydrology (5)
	Lake Plain Sand Prairies (Oak Openings) (10)
	Relict Wet Prairies (10)
	Known occurrence state/federal threatened or endangered species (10)
	Significant migratory songbird/water fowl habitat or usage (10)
	Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

4 (max 20 pts.) | 37 (subtotal)

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

	Aquatic bed
	Emergent
	Shrub
1	Forest
	Mudflats
	Open Water
	Other_____

6b. Horizontal (plan view) Interspersion.
Score only one.

	High (5)
	Moderately high (4)
	Moderate (3)
	Moderately low (2)
X	Low (1)
	None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage.

	Extensive >75% cover (-5)
	Moderate 25-75% cover (-3)
	Sparse 5-25% cover (-1)
	Nearly absent <5% cover (0)
X	Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

0	Vegetated hummucks/tussucks
1	Coarse woody debris >15cm (6in)
0	Standing dead >25cm (10in) dbh
0	Amphibian breeding pools

Vegatation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality.
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality.

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened, or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present in very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

37 GRAND TOTAL (max 100 pts)

Refer to the most recent ORAM score calibration report for the scoring breakpoints between categories at the following address: http://epa.state.oh.us/dsw/401/401.html

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES (NO)	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES (NO)	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES (NO)	If yes, Category 3.
	Question 4. Significant bird habitat	YES (NO)	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES (NO)	If yes, Category 1.
	Question 6. Bogs	YES (NO)	If yes, Category 3.
	Question 7. Fens	YES (NO)	If yes, Category 3.
	Question 8a. Old Growth Forest	YES (NO)	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES (NO)	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES (NO)	If yes, Category 3
	Question 11. Relict Wet Prairies	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	1	
	Metric 2. Buffers and surrounding land use	8	
	Metric 3. Hydrology	11	
	Metric 4. Habitat	13	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	4	
	TOTAL SCORE	37	Category based on score breakpoints Modified 2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	(NO)	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	(NO)	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	(NO)	Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	(YES) Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	(NO)	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	(NO) Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

WET-2

Final Category

Choose one	Category 1	(Category 2)	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name:	Lauren Schirtzinger
Date:	05/11/2021
Affiliation:	POWER Engineers, Inc.
Address:	6530 W. Campus Oval Road, 2nd Floor, Suite 200, New Albany, OH 43054
Phone Number:	614-582-6481
e-mail address:	Lauren.Schirtzinger@powereng.com
Name of Wetland:	WET-3
Vegetation Communit(ies):	Palustrine Emergent
HGM Class(es):	Depressional

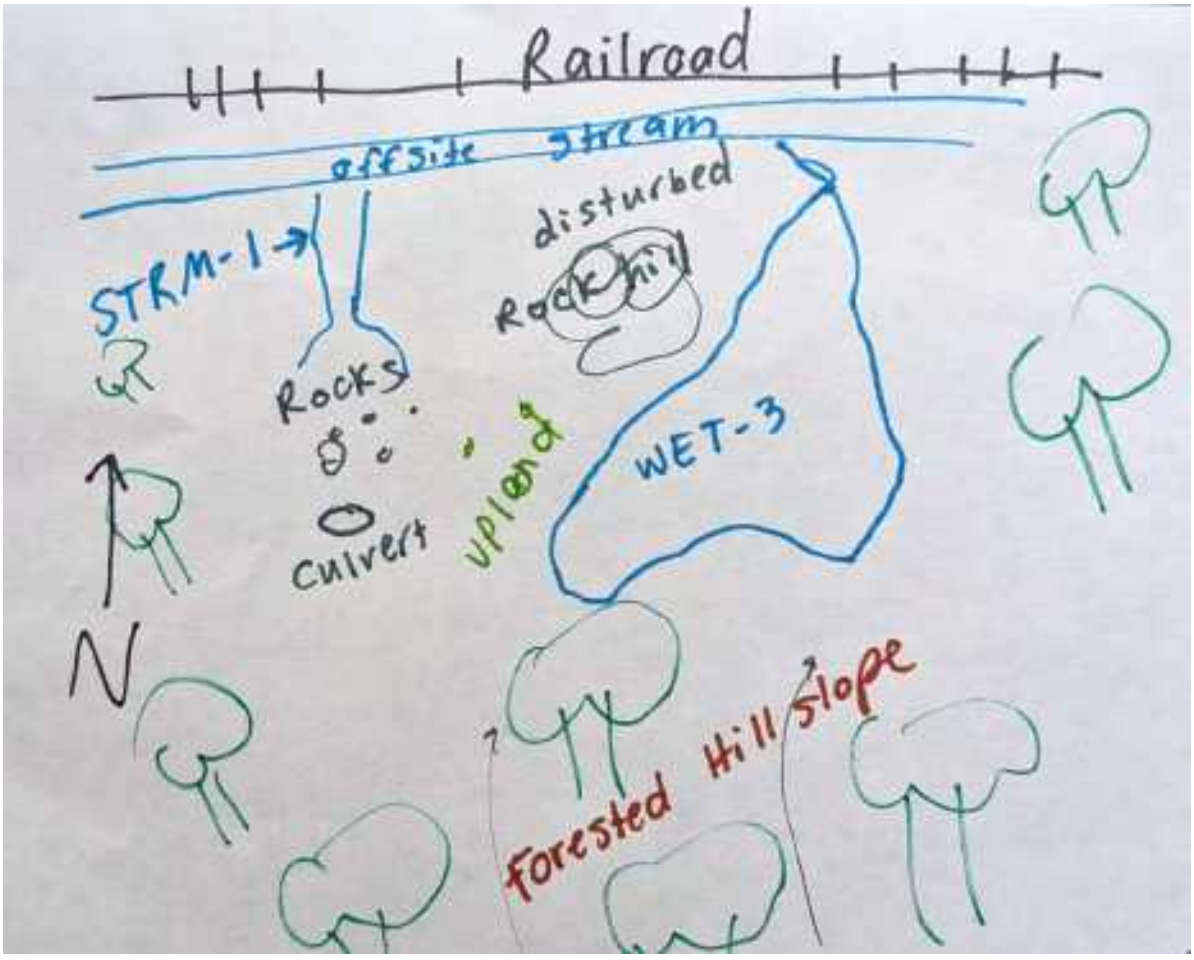
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.

Please see Ecological Report

Lat/Long or UTM Coordinate	41.402375 -82.254104
USGS Quad Name	Vermilion East
County	Lorain County
Township	Amherst
Section and Subsection	N/A
Hydrologic Unit Code	0411001
Site Visit	05/11/2021
National Wetland Inventory Map	Non-wetland
Ohio Wetland Inventory Map	No
Soil Survey	Qu - Quarries
Delineation report/map	Amherst #2 Substation and Transmission Line Project-Ecological Survey Report

Name of Wetland: WET-3	
Wetland Size (acres, hectares): 0.01-acre	

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.



Comments, Narrative Discussion, Justification of Category Changes:

Dominant vegetation in WET-3 included: Spotted jewelweed (Impatiens capensis) and field horsetail (Equisetum arvense).

Indicators of hydrology included high water table, saturation, sparsely vegetated concave surface, water-stained leaves, drainage patterns, and FAC-Neutral test.

The indicator for hydric soil was a depleted matrix a 2cm of muck.

Final score :	15	**Category:**	1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland*. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	X
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.		X

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	**Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	**Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	**Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	**Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	**Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	**Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	**"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	**Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	**Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project	Lauren Schirtzinger	Date: 5/11/2021

Metric 1. Wetland Area (size).

0 (max 6 pts.) | 0 (subtotal)

Select one size class and assign score.

	>50 acres (>20.2ha) (6 pts)
	25 to <50 acres (10.1 to <20.2ha) (5 pts)
	10 to <25 acres (4 to <10.1 ha) (4 pts)
	3 to <10 acres (1.2 to <4 ha) (3 pts)
	0.3 to < 3 acres (012 to <1.2ha) (2 pts)
	0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
X	<0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

4 (max 14 pts.) | 4 (subtotal)

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

	WIDE. Buffers average 50m (164 ft) or more around wetland perimeter (7)
	MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
X	NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
	VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

	VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
X	LOW. Old field (>10 years), shrubland, young second growth forest. (5)
	MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
X	HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

5 (max 30 pts.) | 9 (subtotal)

3a. Sources of Water. Score all that apply.

	High pH groundwater (5)
	Other groundwater (3)
X	Precipitation (1)
	Seasonal/Intermittent surface water (3)
	Perennial surface water (lake or stream (5)

3b. Connectivity. Score all that apply.

	100 year floodplain (1)
	Between stream/lake and other human use (1)
	Part of wetland/upland (e.g. forest), complex (1)
	Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

	>0.7 (27.6in) (3)
	0.4 to 0.7m (15.7 to 27.6in) (2)
X	<0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

	Semi- to permanently inundated/saturated (4)
	Regularly inundated/saturated (3)
X	Seasonally inundated (2)
	Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

	None or none apparent (12)
	Recovered (7)
	Recovering (3)
X	Recent or no recovery (1)

Check all disturbances observed

	ditch		point source (nonstormwater)
	tile	X	filling/grading
	dike	X	road bed/RR track
	weir		dredging
	stormwater input		Other

Metric 4. Habitat Alternation and Development.

3 (max 20 pts.) | 12 (subtotal)

4a. Substrate disturbance. Score one or double check and average.

	None or none apparent (4)
	Recovered (3)
	Recovering (2)
X	Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

	Excellent (7)
	Very good (6)
	Good (5)
	Moderately good (4)
	Fair (3)
	Poor to fair (2)
X	Poor (1)

4c. Habitat alteration. Score one or double check and average.

	None or none apparent (9)
	Recovered (6)
	Recovering (3)
X	Recent or no recovery (1)

Check all disturbances observed

	mowing	X	shrub/sapling removal
	grazing		herbaceous/aquatic bed removal
	clearcutting		sedimentation
X	selective cutting		dredging
	woody debris removal		farming
	toxic pollutants		nutrient enrichment

12 subtotal this page

Site: Amherst #2 Substation Expansion and 138 kV Transmission Line Project	Lauren Schirtzinger	Date: 5/11/2021

12
subtotal first page

Metric 5. Special Wetlands.

0 (max 10 pts.) | 12 (subtotal)

Check all that apply and score as indicated.

	Bog (10)
	Fen (10)
	Old growth forest (10)
	Mature forested wetland (5)
	Lake Erie coastal/tributary wetland -unrestricted hydrology (10)
	Lake Erie coastal/tributary wetland-restricted hydrology (5)
	Lake Plain Sand Prairies (Oak Openings) (10)
	Relict Wet Prairies (10)
	Known occurrence state/federal threatened or endangered species (10)
	Significant migratory songbird/water fowl habitat or usage (10)
	Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

3 (max 20 pts.) | 15 (subtotal)

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

	Aquatic bed
1	Emergent
	Shrub
	Forest
	Mudflats
	Open Water
	Other_____

6b. Horizontal (plan view) Interspersion.
Score only one.

	High (5)
	Moderately high (4)
	Moderate (3)
	Moderately low (2)
	Low (1)
X	None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage.

	Extensive >75% cover (-5)
	Moderate 25-75% cover (-3)
	Sparse 5-25% cover (-1)
	Nearly absent <5% cover (0)
X	Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

0	Vegetated hummucks/tussucks
1	Coarse woody debris >15cm (6in)
0	Standing dead >25cm (10in) dbh
0	Amphibian breeding pools

Vegatation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality.
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality.

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened, or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present in very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

15 GRAND TOTAL (max 100 pts)

Refer to the most recent ORAM score calibration report for the scoring breakpoints between categories at the following address: http://epa.state.oh.us/dsw/401/401.html

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES (NO)	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES (NO)	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES (NO)	If yes, Category 3.
	Question 4. Significant bird habitat	YES (NO)	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES (NO)	If yes, Category 1.
	Question 6. Bogs	YES (NO)	If yes, Category 3.
	Question 7. Fens	YES (NO)	If yes, Category 3.
	Question 8a. Old Growth Forest	YES (NO)	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES (NO)	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES (NO)	If yes, Category 3
	Question 11. Relict Wet Prairies	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	0	
	Metric 2. Buffers and surrounding land use	4	
	Metric 3. Hydrology	5	
	Metric 4. Habitat	3	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	3	
	TOTAL SCORE	15	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

WET-3

	Final Category		
Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

APPENDIX E PRELIMINARY HHEI FORM

Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3): 48

SITE NAME/LOCATION: **Amherst #2 Substation Expansion and 138 kV Transmission Line Project**

SITE NUMBER: **STRM-1** RIVER BASIN: **04110001** RIVER CODE: **N/A** DRAINAGE AREA (mi²): **0.01**

LENGTH OF STREAM REACH (ft): **200** LAT: **41.40245** LONG: **-82.25420** RIVER MILE: **N/A**

DATE: **05/11/2021** SCORER: **LAS** COMMENTS: **Intermittent**

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ■ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes.

(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		■	SILT [3 pt]	30%
☐	BOULDER (>256 mm) [16 pts]	1%	☐	LEAF PACK/WOODY DEBRIS [3 pts]	5%
☐	BEDROCK [16 pts]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	24%	☐	CLAY or HARDPAN [0 pt]	
■	GRAVEL (2-64 mm) [9 pts]	30%	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]	10%	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: **25**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) **12** TOTAL NUMBER OF SUBSTRATE TYPES: (B) **6**

HHEI Metric Points — Substrate Max = 40: **18** (A + B)

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61 meter (200 feet)* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

☐	> 30 centimeters [20 pts] (> 11-13/16")	■	5 cm - 10 cm [15 pts] (> 1-31/32" - 3-15/16")
☐	> 22.5 - 30 cm [30 pts] (> 8-7/8" - 11-13/16")	☐	< 5 cm [5pts] (< 1-31/32")
☐	> 10 - 22.5 cm [25 pts] (> 3-15/16" - 8-7/8")	☐	NO WATER OR MOIST CHANNEL [0pts]

7.62

COMMENTS: _____ MAXIMUM POOL DEPTH (centimeters): **7.62**

Pool Depth Max = 30: **15**

3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):

☐	> 4.0 meters (> 13') [30 pts]	■	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	☐	≤ 1.0 m (≤ 3' 3") [5 pts]
☐	> 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]		

1.37

COMMENTS: _____ AVERAGE BANKFULL WIDTH (meters): **1.37**

Bankfull Width Max=30: **15**

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY (NOTE: River Left (L) and Right (R) as looking downstream)

RIPARIAN WIDTH (Per Bank)

L	R	
☐	☐	Wide >10m
☐	☐	Moderate 5-10m
■	■	Narrow <5m
☐	☐	None

FLOODPLAIN QUALITY (Most Predominant per Bank)

L	R		L	R	
☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
■	■	Immature Forest, Shrub or Old Field	■	■	Urban or Industrial
☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS: **Near railroad tracks**

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

- ■ Stream Flowing
- ☐ Subsurface flow with isolated pools (interstitial)
- ☐ Moist Channel, isolated pools, no flow (intermittent)
- ☐ Dry channel, no water (ephemeral)

COMMENTS: **Located below large culvert**

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

■ None	☐ 1.0	☐ 2.0	☐ 3.0
☐ 0.5	☐ 1.5	☐ 2.5	☐ >3

STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft) ■ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ■ No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

■ EWH Name: Lake Erie Distance from Evaluated Stream 2.5-miles

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: Vermilion East NRCS Soil Map Page: N/A NRCS Soil Map Stream Order: N/A

County: Lorain County Township/City: Amherst

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 05/10/21 Quantity: 1.13-inches

Photo-documentation Notes: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 55

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): N/A

Field Measures: Temp (°C) 10.2 Dissolved Oxygen (mg/l) N/A pH (S.U.) 8.1 Conductivity (umhos/cm) N/A

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: In area impacted by railroad

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

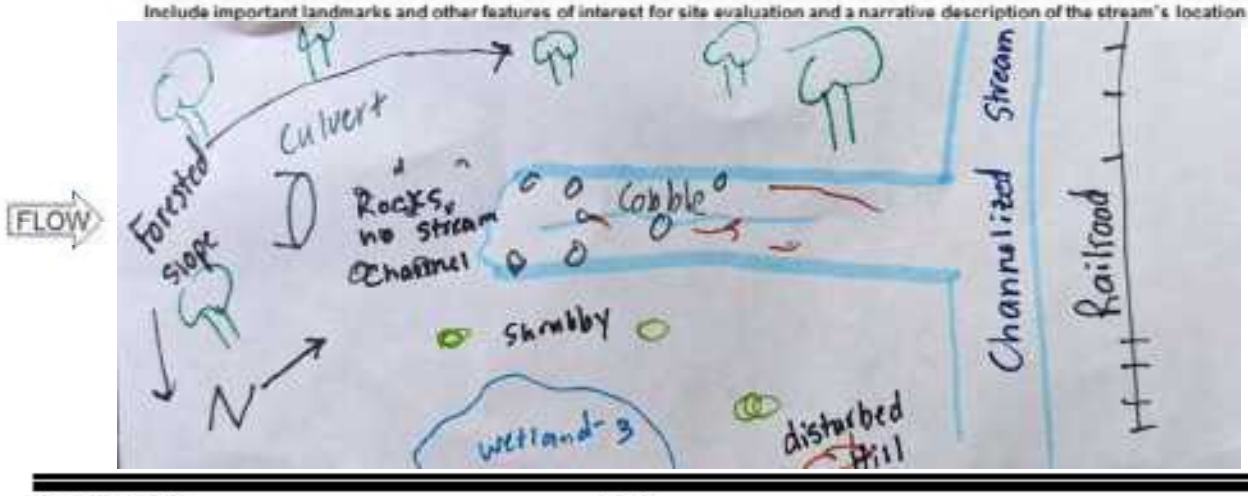
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



APPENDIX F AGENCY CORRESPONDENCE

From: Ohio, FW3 <ohio@fws.gov>
Sent: Thursday, June 10, 2021 2:59 PM
To: Schirtzinger, Lauren <lauren.schirtzinger@powereng.com>
Cc: nathan.reardon@dnr.state.oh.us; Parsons, Kate <kate.parsons@dnr.state.oh.us>; Nietz, Jennifer <jennifer.nietz@powereng.com>
Subject: [EXTERNAL] AMPT Amherst #2 Substation Project, Lorain County, Ohio

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994

TAILS# 03E15000-2021-TA-1486

Dear Ms. Schirtzinger,

The U.S Fish and Wildlife Service (Service) has received your recent correspondence requesting information about the subject proposal. We offer the following comments and recommendations to assist you in minimizing and avoiding adverse impacts to threatened and endangered species pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq), as amended (ESA).

Federally Threatened and Endangered Species: The endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*) occur throughout the State of Ohio. The Indiana bat and northern long-eared bat may be found wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and breed that may also include adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, woodlots, fallow fields, and pastures. Roost trees for both species include live and standing dead trees ≥3 inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities. These roost trees may be located in forested habitats as well as linear features such as fencerows, riparian forests, and other wooded corridors. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. In the winter, Indiana bats and northern long-eared bats hibernate in caves, rock crevices and abandoned mines.

Seasonal Tree Clearing for Federally Listed Bat Species: Should the proposed project site contain trees ≥3 inches dbh, we recommend avoiding tree removal wherever possible. If any caves or abandoned mines may be disturbed, further coordination with this office is requested to determine if fall or spring portal surveys are warranted. If no caves or abandoned mines are present and trees ≥3 inches dbh cannot be avoided, we recommend removal of any trees ≥3 inches dbh only occur between October 1 and March 31. Seasonal clearing is recommended to avoid adverse effects to Indiana bats and northern long-eared bats. While incidental take of northern long-eared bats from most tree clearing is exempted by a 4(d) rule (see http://www.fws.gov/midwest/endangered/mammals/nleb/index.html [fws.gov]), incidental take of Indiana bats is still prohibited without a project-specific exemption. Thus, seasonal clearing is recommended where Indiana bats are assumed present.
If implementation of this seasonal tree cutting recommendation is not possible, a summer presence/absence survey may be conducted for Indiana bats. If Indiana bats are not detected during the survey, then tree clearing may occur at any time of the year. Surveys must be conducted by an approved surveyor and be designed and

conducted in coordination with the Ohio Field Office. Surveyors must have a valid federal permit. Please note that in Ohio summer mist net surveys may only be conducted between June 1 and August 15.

Section 7 Coordination: If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), then no tree clearing should occur on any portion of the project area until consultation under section 7 of the ESA, between the Service and the federal action agency, is completed. We recommend the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence. This letter provides technical assistance only and does not serve as a completed section 7 consultation document.

Stream and Wetland Avoidance: Over 90% of the wetlands in Ohio have been drained, filled, or modified by human activities, thus is it important to conserve the functions and values of the remaining wetlands in Ohio (https://epa.ohio.gov/portals/47/facts/ohio_wetlands.pdf [epa.ohio.gov]). We recommend avoiding and minimizing project impacts to all wetland habitats (e.g., forests, streams, vernal pools) to the maximum extent possible in order to benefit water quality and fish and wildlife habitat. Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the U.S. Army Corps of Engineers should be contacted to determine whether a Clean Water Act section 404 permit is required. Best management practices should be used to minimize erosion, especially on slopes. Disturbed areas should be mulched and revegetated with native plant species. In addition, prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, or proposed species, or proposed or designated critical habitat. Should the project design change, or additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, coordination with the Service should be initiated to assess any potential impacts.

Thank you for your efforts to conserve listed species and sensitive habitats in Ohio. We recommend coordinating with the Ohio Department of Natural Resources due to the potential for the proposed project to affect state listed species and/or state lands. Contact Mike Pettegrew, Acting Environmental Services Administrator, at (614) 265-6387 or at mike.pettegrew@dnr.state.oh.us.

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or ohio@fws.gov.

Sincerely,

Patrice Ashfield
Field Office Supervisor

cc: Nathan Reardon, ODNR-DOW
Kate Parsons, ODNR-DOW

Office of Real Estate
John Kessler, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6621
Fax: (614) 267-4764

July 23, 2021

Lauren Schirtzinger
Power Engineering, Inc.
11733 Chesterdale Road
Cincinnati, Ohio 45246

Re: 21-0520; Amherst No. 2 Substation Project

Project: The proposed project involves the expansion of the existing 69 kilovolt (kV) substation and 0.3 miles of 138 kV transmission line between Amherst #2 Substation and the existing Beaver – Black River 138 kV Transmission Line.

Location: The proposed project is located in Amherst Township, Lorain County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Natural Heritage Database: The Natural Heritage Database has the following records at or within a one-mile radius of the project area:

Round-leaved dogwood (*Cornus rugose*), State potentially threatened
Amherst Beaver Creek Reservation – Lorain Co. Metro Parks

The review was performed on the project area specified in the request as well as an additional one-mile radius. Records searched date from 1980. This information is provided to inform you of features present within your project area and vicinity. Additional comments on some of the features may be found in pertinent sections below.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to streams, wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The entire state of Ohio is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species, the northern long-eared bat (*Myotis septentrionalis*), a state endangered and federally threatened species, the little brown bat (*Myotis lucifugus*), a state endangered species, and the tricolored bat (*Perimyotis subflavus*), a state endangered species. During the spring and summer (April 1 through September 30), these species of bats predominately roost in trees behind loose, exfoliating bark, in crevices and cavities, or in the leaves. However, these species are also dependent on the forest structure surrounding roost trees. If trees are present within the project area, and trees must be cut, the DOW recommends cutting only occur from October 1 through March 31, conserving trees with loose, shaggy bark and/or crevices, holes, or cavities, as well as trees with DBH ≥ 20 if possible. If trees are present within the project area, and trees must be cut during the summer months, the DOW recommends a mist net survey or acoustic survey be conducted from June 1 through August 15, prior to any cutting. Mist net and acoustic surveys should be conducted in accordance with the most recent version of the "*OHIO DIVISION OF WILDLIFE GUIDANCE FOR BAT SURVEYS AND TREE CLEARING*". https://ohiodnr.gov/static/documents/wildlife/wildlife-management/Bat+Survey+Guidelines.pdf

If state listed bats are documented, DOW recommends cutting only occur from October 1 through March 31, however, limited summer tree cutting may be acceptable after consultation with DOW (contact Erin Hazelton, Erin.Hazelton@dnr.ohio.gov)

The DOW also recommends that a desktop habitat assessment, followed by a field assessment if needed, is conducted to determine if there are potential hibernaculum(a) present within the project area. Information about how to conduct habitat assessments can be found in the current USFWS "*Range-wide Indiana Bat Survey Guidelines*." If a habitat assessment finds that potential hibernacula are present within 0.25 miles of the project area, please send this information to Erin Hazelton, Erin.Hazelton@dnr.ohio.gov for project recommendations. If a potential or known hibernaculum is found, the DOW recommends a 0.25-mile tree cutting and subsurface disturbance buffer around the hibernaculum entrance, however, limited summer or winter tree cutting may be acceptable after consultation with DOW. If no tree cutting or subsurface impacts to a hibernaculum are proposed, this project is not likely to impact these species.

The project is within the range of the black sandshell (*Ligumia recta*), a state threatened mussel, and the pondhorn (*Uniomerus tetralasmus*), a state threatened mussel. Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.

The project is within the range of the following listed fish species:

State Endangered
lake sturgeon (*Acipenser fulvescens*)
Ohio lamprey (*Ichthyomyzon bdellium)*
spotted gar (*Lepisosteus oculatus*)

State Threatened
American eel (*Anguilla rostrata*)
bigmouth shiner (*Notropis dorsalis*)
channel darter (*Percina copelandi*)

The DOW recommends no in-water work in perennial streams from March 15 through June 30 to reduce impacts to indigenous aquatic species and their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact these or other aquatic species.

The project is within the range of the Blanding's turtle (*Emydoidea blandingii*), a state threatened species. This species inhabits marshes, ponds, lakes, streams, wet meadows, and swampy forests. Although essentially aquatic, the Blanding's turtle will travel over land as it moves from one wetland to the next. Due to the location, the type of habitat within the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the spotted turtle (*Clemmys guttata*), a state threatened species. This species prefers fens, bogs and marshes, but also is known to inhabit wet prairies, meadows, pond edges, wet woods, and the shallow sluggish waters of small streams and ditches. Due to the location, the type of habitat within the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the American bittern (*Botaurus lentiginosus*), a state endangered bird. Nesting bitterns prefer large undisturbed wetlands that have scattered small pools amongst dense vegetation. They occasionally occupy bogs, large wet meadows, and dense shrubby swamps. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, the project is not likely to impact this species.

The project is within the range of the black-crowned night-heron *(Nycticorax nycticorax*), a state-threatened bird. Night-herons are so named because they are nocturnal, conducting most of their foraging in the evening hours or at night, and roost in trees near wetlands and waterbodies during the day. Night herons are migratory and are typically found in Ohio from April 1 through December 1 but can be found in more urbanized areas with reliable food sources year-round. Black-crowned night-herons primarily forage in wetlands and other shallow aquatic habitats, and roost in trees nearby. These night-herons nest in small trees, saplings, shrubs, or sometimes on the ground, near bodies of water and wetlands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the lark sparrow (*Chondestes grammacus*), a state endangered bird. This sparrow nests in grassland habitats with scattered shrub layers, disturbed open areas, as well as patches of bare soil. These summer residents normally migrate out of Ohio shortly after their young fledge or leave the nest. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the least bittern (*Ixobrychus exilis*), a state threatened bird. This secretive marsh species prefers dense emergent wetlands with dense, tall growths of aquatic or semiaquatic vegetation (particularly cattail, sedge, rushes, arrowheads, or sawgrass) interspersed with clumps of woody vegetation and open water. Nests are made from dried vegetation suspended .5 to 2.5 feet above the water. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the northern harrier (*Circus hudsonis*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a

nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 through July 31. If this habitat will not be impacted, the project is not likely to impact this species.

The project is within the range of the sandhill crane (*Grus canadensis*), a state endangered species. Sandhill cranes are primarily a wetland-dependent species. On their wintering grounds, they will utilize agricultural fields; however, they roost in shallow, standing water or moist bottomlands. On breeding grounds, they require a rather large tract of wet meadow, shallow marsh, or bog for nesting. If grassland, prairie, or wetland habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 1 through August 31. If this habitat will not be impacted, this project is not likely to have an impact on this species.

The project is within the range of the trumpeter swan (*Cygnus buccinator*), a state threatened bird. Trumpeter swans prefer large marshes and lakes ranging in size from 40 to 150 acres. They like shallow wetlands one to three feet deep with a diverse mix of plenty of emergent and submergent vegetation and open water. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 through June 15. If this habitat will not be impacted, this project is not likely to have an impact on this species.

The project is within the range of the upland sandpiper (*Bartramia longicauda*), a state endangered bird. Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (CRP). If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

Natural Areas: The Division of Natural Areas and Preserves has the following comment.

Two rare plant species, the round-leaved dogwood (*Cornus rugosa*, state species of concern) and rock harlequin (*Capnoides sempervirens,* state endangered) have previously been found within the footprint of the proposed Amherst #2 substation project. Due to the possible disruption of these species, a pre-construction survey of the proposed project site should be conducted to ensure that the plants and any other rare species within the proposed construction limits are not impacted. If there are any questions about Ohio flora or if survey assistance is required, please contact the Division of Natural Areas and Preserves' Chief Botanist, Rick Gardner. Mr. Gardner can be contacted directly at richard.gardner@dnr.ohio.gov or (614) 265-6419.

Water Resources: The Division of Water Resources has the following comment.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project. Your local floodplain administrator contact information can be found at the website below.

http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List_8_16.pdf

ODNR appreciates the opportunity to provide these comments. Please contact Sarah Tebbe, Environmental Specialist, at Sarah.Tebbe@dnr.ohio.gov if you have questions about these comments or need additional information.

Mike Pettegrew
Environmental Services Administrator (Acting)

Orbis Environmental Consulting
PO Box 10235 South Bend, IN 46680
574-635-1338

November 5, 2021

Jennifer Nietz
POWER Engineers
6530 W. Campus Oval
Suite 200
New Albany, OH 43054

Re: Amherst, Ohio Rare Plant Field Survey (Orbis #2107014)

Dear Ms. Nietz:

Orbis Environmental Consulting (Orbis) was contracted by POWER Engineers (POWER) to conduct a field survey for the Ohio-listed plants *Capnoides sempervirens* (rock-harlequin) and *Cornus rugosa* (round-leaved dogwood) in a proposed utility project site in Amherst, Lorain County, Ohio (Orbis #2107014). The following report summarizes the results of the survey.

INTRODUCTION

In July 2021, POWER contracted with Orbis to conduct a field survey for two vascular plant species of conservation concern in Ohio that were historically documented from the vicinity of a proposed utility project site, consisting of a 0.7-mile long, 300' wide corridor located near Quarry Road in Amherst, Lorain County, Ohio (Figure 1). *Capnoides sempervirens* (rock-harlequin) is a biennial herb characteristic of rocky habitats, particularly in areas of recent soil disturbance, and is known in Ohio primarily from the Allegheny Plateau region (Kartesz 2015). It is listed as an Endangered species in Ohio (Ohio Department of Natural Resources 2021). *Cornus rugosa* (round-leaved dogwood) is a rhizomatous shrub of forests, thickets, and shores, known in Ohio primarily from the counties bordering Lake Erie (Cooperrider 1995; Kartesz 2015). It is listed as a Potentially Threatened species in Ohio (Ohio Department of Natural Resources 2021). Orbis was also contracted to record any other listed plant species incidentally observed at the project site. The field survey was conducted on October 5, 2021.

METHODS

On October 5, 2021, Orbis visited the site and conducted visual surveys for *Capnoides sempervirens*, *Cornus rugosa*, and other listed plant species in the approximately 0.7-mile long, 300' wide project site (Figure 1). For each individual or population of a state-listed plant species observed in the field, Orbis planned to record its location using a hand-held GPS unit and document information on life stages (flowering vs. non-flowering), occupied habitats/microhabitats, and associated species. Representative photographs were also taken.

RESULTS

The project site is part of a suburban landscape on the west side of Amherst. Landcover is a mix of suburban development, including residences and associated roads and driveways, lawn, an electrical substation and associated poles, a constructed retention wetland, old field, and immature forest (Figure 1). Sandstone outcrops are prevalent on and near the western portion of the project site, and at least one former quarry is present.

The principal habitats of interest were the wooded areas and sandstone outcroppings. The forests on site are characterized by immature, mixed canopies consisting primarily of *Acer rubrum* (red maple), *Juglans nigra* (black walnut), *Liriodendron tulipifera* (tulip tree), *Populus deltoides* (cottonwood), *Quercus rubra* (red oak), *Sassafras albidum* (sassafras), *Tilia americana* (basswood), and *Ulmus rubra* (slippery elm). Common native understory species included *Cornus drummondii* (rough-leaved dogwood), *Fraxinus americana* (white ash), *Hamamelis virginiana* (witch-hazel), and *Ostrya virginiana* (hop-hornbeam). Invasive species were abundant, represented by *Berberis aquifolium* (Oregon-grape), *Frangula alnus* (glossy buckthorn), *Ligustrum vulgare* (common privet), *Lonicera* spp. (non-native honeysuckles), *Morus alba* (white mulberry), *Pyrus calleryana* (Bradford pear), *Rhamnus cathartica* (common buckthorn), *Rosa multiflora* (multiflora rose), and *Viburnum opulus* (European highbush-cranberry). The low shrub and herbaceous layer consisted primarily of weedy native and non-native taxa such as *Ageratina altissima* (white snakeroot), *Alliaria petiolata* (garlic mustard), *Dactylis glomerata* (orchard grass), *Geum canadense* (white avens), *Leonurus cardiaca* (motherwort), *Persicaria longiseta* (creeping smartweed), *P. virginica* (jumpseed), *Phytolacca americana* (pokeberry), *Rubus allegheniensis* (common blackberry), and *R. occidentalis* (black raspberry).

The sandstone outcroppings on site are largely degraded, having been impacted by quarrying, railroad construction, and suburban development more generally. They support many of the aforementioned weedy native and non-native species, but less disturbed areas support a scattering of more conservative species, including *Heuchera americana* (alum root), *Micranthes virginiensis* (early saxifrage), and *Sambucus racemosa* (red-berried elder).

No individuals or populations of *Capnoides sempervirens*, *Cornus rugosa*, or other Ohio-listed plant species were observed at the project site.

DISCUSSION

No state-listed plant species were observed at the project site. Existing landcover is primarily cultural (infrastructure, including lawns) and ruderal (young forests on formerly cleared ground; old fields and thickets in former quarry and in utility right-of-way). The extent and severity of land disturbance and abundance of invasive plant species indicate low potential for *Capnoides sempervirens*, *Cornus rugosa*, and other listed plant species.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of the October 5 field survey, no listed plant species are likely to be impacted by construction activities conducted within the 0.7-mile long, 300' wide project site, and no further surveys are suggested.

Sincerely,

Brad Slaughter
Botanist

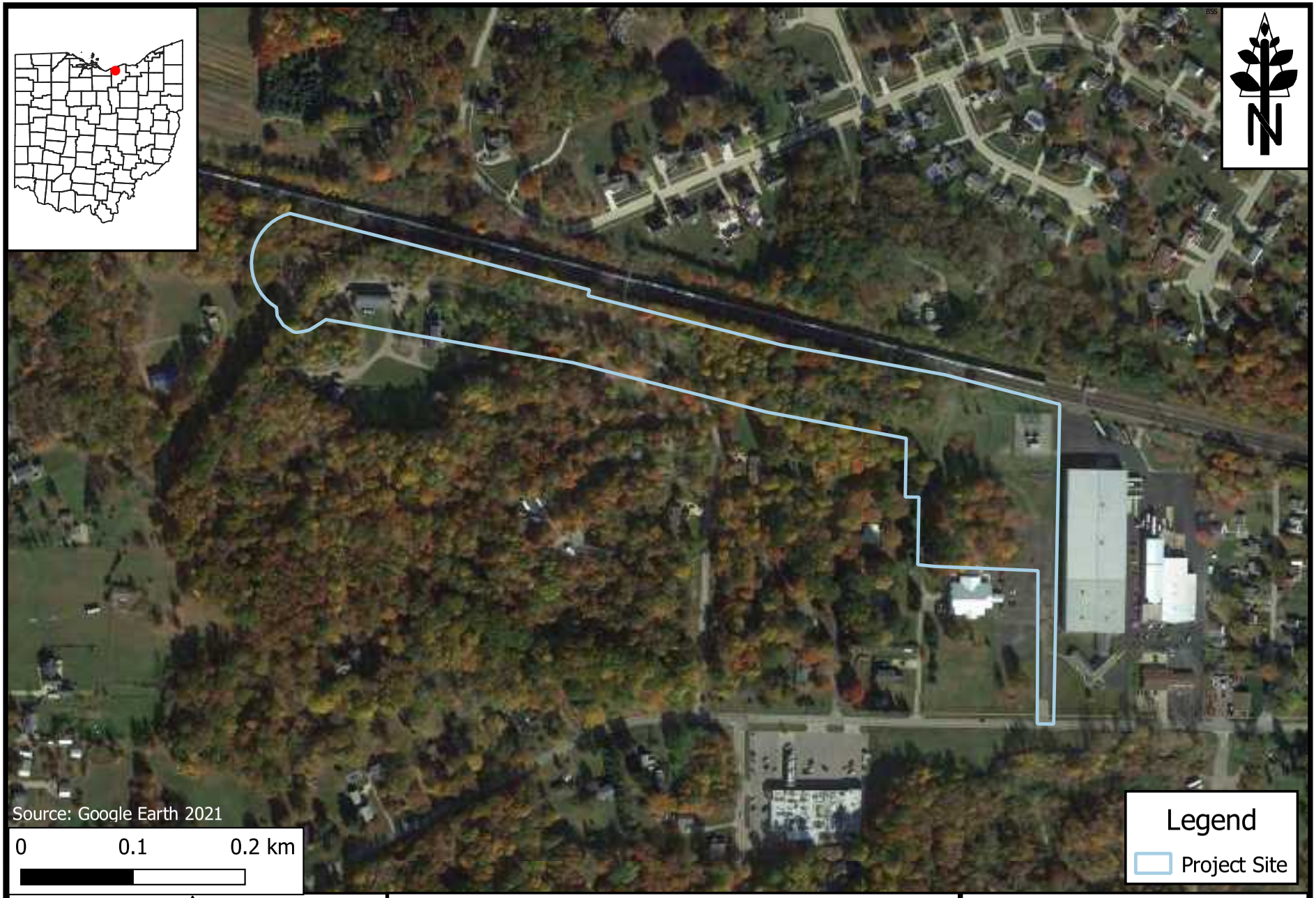
attachments: Figure 1
Photopages
#2107014

LITERATURE CITED

Cooperrider, T.S. 1995. The *Dicotyledoneae* of Ohio, Part Two: Linaceae through Campanulaceae. Ohio State University Press, Columbus.

Kartesz, J.T. 2015. The Biota of North America Program (BONAP). North American Plant Atlas. Available at http://bonap.net/napa (Accessed November 3, 2021).

Ohio Department of Natural Resources. 2021. Rare native Ohio plants: 2020-21 status list. Available at https://ohiodnr.gov/static/documents/natural-areas/2020-21+Ohio+Rare+Native+Plants+Status+List+FINAL.pdf (Accessed November 3, 2021).



orbis

Rare Plant Field Survey
POWER Engineers
Amherst, Lorain County, Ohio

Figure #1
Project Site
Project #2107014

1 – Trees with mowed lawn understory on Amherst Fraternal Order of Eagles property.

2 – Mowed lawn and constructed retention basin on City of Amherst property.

3 – Retention basin on City of Amherst property with weedy old field vegetation.

4 – *Cornus drummondii* (rough-leaved dogwood), which is common at the project site, differs from the listed *C. rugosa* (round-leaved dogwood) in having 3-5 lateral veins per leaf side and twigs with brown pith (vs. 6-8 lateral veins and twigs with white pith in *C. rugosa*).

5 – Immature forest on private property south of the Norfolk Southern rail line.

6 – Relatively intact sandstone outcropping with *Dryopteris marginalis* (marginal woodfern), on private property along access drive.

7 – Quarry face just south of project site.

8 – Sandstone outcropping (or modified berm) along private property access drive.

9 – Dense stands of the non-native *Artemisia vulgaris* (mugwort) cover sandstone rubble in an old quarry on private property near the western margin of the project site.

10 – Repeatedly disturbed utility corridor with weedy species at the west margin of the project site.

From: Richard.Gardner@dnr.ohio.gov
To: Nietz, Jennifer
Cc: Branham, Lindsey
Subject: [EXTERNAL] RE: Botanical Survey Questions- Amherst #2
Date: Monday, November 8, 2021 12:40:13 PM
Attachments: image003.png
image004.jpg
image005.png
image006.png

Hi Jennifer,

Thank you for sending me the detailed report. Brad Slaughter with Orbis is an excellent botanist and he certainly would have found any state listed plants if they were present. From the report, I conclude no additional survey work is necessary and the project will not impact any state endangered and threatened plant populations.

Thank you.

Rick Gardner, Chief Botanist
Ohio Department of Natural Resources
Division of Natural Areas and Preserves
2045 Morse Road, H-3
Columbus, OH 43229
614-265-6419 (Office)
614-745-6781 (Cell)

APPENDIX G PHASE I AND PHASE II ENVIRONMENTAL SITE ASSESSMENTS

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July 8, 2021

AMP TRANSMISSION, LLC

Phase I Environmental Site Assessment

Amherst #2 Substation Expansion and 138 kV Transmission Line Project
Amherst, Lorain County, Ohio

PROJECT NUMBER:
167911.02.02

PROJECT CONTACT:
Lindsey Branham
EMAIL:
lindsey.branham@powereng.com
PHONE:
513-326-1565

POWER ENGINEERS

Phase I Environmental Site Assessment
Amherst #2 Substation Expansion and 138 kV Transmission Line Project
Amherst, Lorain County, Ohio

PREPARED FOR: *AMP TRANSMISSION, LLC*

PREPARED BY: *POWER ENGINEERS, INC.*
LINDSEY BRANHAM
513-326-1565
LINDSEY.BRANHAM@POWERENG.COM

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ACRONYMS AND ABBREVIATIONS

AAI	All Appropriate Inquiries
AST	Aboveground Storage Tank
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CERC-NFRAP	Comprehensive Environmental Response, Compensation, and Liability Information System - No Further Remedial Action Planned
CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Regulations
CORRACTS	Resource Conservation and Recovery Act Information System Corrective Action Sites
CREC	Controlled Recognized Environmental Condition
ECHO	Enforcement and Compliance History Information
EDR	Environmental Data Resources
ENG	Engineering
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
FINDS	Facility Index System/Facility Registry System
HREC	Historical Recognized Environmental Condition
INST	Institutional
IRA	Interim Response Action
LUST	Leaking Underground Storage Tank
LQG	Large Quantity Generator
NFA	No Further Action
NFRAP	No Further Remedial Action Planned
NPL	National Priorities List
PCB	Polychlorinated Biphenyl
POWER	POWER Engineers, Inc.
PUSTRCB	Petroleum Underground Storage Tank Release Compensation Board
RCRA	Resource Conservation and Recovery Act
RCRA-NonGen	RCRA sites not generating hazardous waste
RCRIS	Resource Conservation and Recovery Act Information System
REC	Recognized Environmental Condition
Site	Amherst, Lorain County, Ohio
SPILLS	Emergency Response Database
SQG	Small Quantity Generator
SWLF	Solid Waste Landfill
TSDF	Treatment, Storage and Disposal Facility
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program
VSQG	Very Small Quantity Generator

EXECUTIVE SUMMARY

This executive summary presents key findings identified during the Phase I Environmental Site Assessment (ESA) of a 16.04-acre Survey Area located in Amherst, Lorain County, Ohio (the Site, also known as the Survey Area). The Site is proposed for development with an overhead electric transmission line and expansion of the existing Amherst electric substation. The Phase I ESA was conducted in accordance with the agreed work order between POWER Engineers, Inc. (POWER) and AMP Transmission, LLC, dated April 28, 2021.

The purpose of this Phase I ESA was to identify Recognized Environmental Conditions (RECs), Controlled RECs (CRECs), or Historical RECs (HRECs) associated with the Site and perform all appropriate inquiries concerning the Site in accordance with ASTM Standard E 1527-13 and 40 Code of Federal Regulations Part 312. A REC is defined by ASTM Standard E 1527-13 as "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions." A CREC is identified by ASTM International Standard E1527-13 as a REC that has been addressed to the satisfaction of a regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls such as activity or land use restrictions. An HREC is identified by ASTM International Standard E1527-13 as a REC that has been addressed to the satisfaction of a regulatory authority or meets unrestricted land use standards, without the need for controls such as property use restrictions, institutional controls, or engineering controls.

POWER has performed a Phase I ESA of the Site, in conformance with the scope and limitations of ASTM Practice E1527-13. Any exceptions to or deletions from this practice are described in Sections 1.5 and 8.0 of this report.

POWER has chosen an appropriate level of effort consistent with ASTM International Standard E1527-13 for evaluating the status of the property. Based on the scope of activities conducted, no HRECs, CRECs or de minimis issues were identified.

POWER has identified one REC in connection with the Survey Area. The eastern portion of the Survey Area was formerly used as an orchard from 1934 or earlier until at least 1983. Lead and arsenic-containing pesticides were commonly used in orchards from the late 1800s until the mid-1900s. If used in the Survey Area, elevated concentrations of these metals may be present in soils that may be disturbed during construction. POWER recommends limited sampling and analysis of soils of the Survey Area to evaluate for the presence of elevated concentrations of metals.

1.0 INTRODUCTION

1.1 Purpose

In May 2021, POWER Engineers, Inc. (POWER) conducted a Phase I Environmental Site Assessment (ESA) of 16.04 acres of property proposed for development with an overhead electric transmission line and expansion of an existing electric substation located in Amherst, Lorain County, Ohio (Site). The location of the Site is shown on Figure 1.

This Phase I ESA was conducted in general conformance with ASTM International Practice E 1527-13, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. The purpose of this practice is to define good commercial and customary practice for conducting an environmental site assessment of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products. As such, this practice is intended to permit a user to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitation on CERCLA liability; that is, the practice that constitutes all appropriate inquiries into the previous ownership and uses of the property consistent with good commercial and customary practice as defined at 42 United States Code § 9601(35)(B).

In defining a standard of good commercial and customary practice for conducting an environmental site assessment, the goal of the process is to identify Recognized Environmental Conditions (RECs), Controlled Recognized Environmental Conditions (CRECs) and Historical Recognized Environmental Conditions (HRECs) in connection with the Site. The term REC means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions. A CREC is identified by ASTM International Standard E1527-13 as a REC that has been addressed to the satisfaction of a regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls such as activity or land use restrictions. An HREC is identified by ASTM International Standard E1527-13 as a REC that has been addressed to the satisfaction of a regulatory authority or meets unrestricted land use standards, without the need for controls such as property use restrictions, institutional controls, or engineering controls.

Details of the work performed, sources of information, and findings are presented in the report. Limitations of the assessment are described in Sections 1.2, 1.3, and 1.5.

1.2 Methodology

A Phase I ESA generally includes a records review, site reconnaissance, and interviews with owners, operators, and occupants of the Site, if available, as well as with local government officials. More specifically, this assessment includes the following components.

- An inspection of the Site for visual evidence of potential environmental concerns including: existing or potential soil and groundwater contamination as evidenced by soil or pavement staining or discoloration, or stressed vegetation; indications of waste dumping or burial, pits, ponds, or lagoons; containers of hazardous substances or petroleum products; electrical and

hydraulic equipment that may contain polychlorinated biphenyls (PCBs), such as electrical transformers and hydraulic hoists; and present or former underground storage tanks (USTs) and aboveground storage tanks (ASTs).

- A Site property line visual assessment of adjacent properties for evidence of potential offsite environmental conditions that may affect the Site.
- An investigation of historical use of the Site through reasonably ascertainable sources (e.g., aerial photographs, fire insurance maps) for evidence of prior land use that could have led to RECs.
- A review of available information concerning general geology and topography of the Site, local groundwater conditions, sources of water, power, and sewer, and proximity to ecologically sensitive receptors, such as streams, that might be impacted by RECs and other environmental issues.
- A review of environmental records available from the client, property owner or Site contact including regulatory agency reports, permits, registrations, and consultants' reports for evidence of RECs.
- A review of a commercial database summary of federal, state, and tribal regulatory agency records pertinent to the Site and off-site facilities located within ASTM-specified search distances from the Site.
- Interviews with the subject property owner or their designated key site manager, occupants and state/local government officials, regarding current and previous uses of the property, particularly activities involving hazardous substances and petroleum products.

The Phase I ESA was performed by Lindsey Branham and Eric Riekert, representatives of POWER. Lindsey Branham and Eric Riekert are Environmental Professionals as defined in §312.10 of 40 Code of Federal Regulations (C.F.R.) 312. Resumes for the professionals involved in this assessment are included in Appendix A. Photographs taken at the time of the site inspection are included in Appendix B.

1.3 User Responsibilities

ASTM Standard E 1527-13 identifies several responsibilities of the user of a Phase I ESA. According to the ASTM Standards, these tasks "do not require the technical expertise of an environmental professional and are generally not performed by environmental professionals performing Phase I ESAs." However, the user's review of the certain non-technical data can help identify the possibility of recognized environmental conditions at a site.

Therefore, the ASTM Standard specifies that the user review the information listed below.

- Specialized knowledge, actual knowledge or experience of the user, specifically any information related to the presence of contamination at the Site.
- The relationship of the purchase price to the fair market value of the Site (assuming that the Site is not impacted by petroleum products or hazardous materials). The user should try to identify an explanation for a lower purchase price that does not reasonably reflect fair market value if the Site is not contaminated and make written record of such explanation.
- Commonly known information within the local community that indicates the possible presence of contamination.

- Title and, if applicable, judicial records for environmental liens or activity use limitations recorded against a property.

A questionnaire related to these user responsibilities is provided as Appendix C.

1.4 Statement of Reliance

This report is intended for the sole use and benefit of, and may be relied upon by, AMP Transmission, LLC, and their affiliates and assigns. Any uses of, or reliance on, this report is subject to the limitations set forth in this report, and the terms and conditions of any agreement with POWER regarding the performance of the evaluation described herein. This report may not be used or relied upon by any other party without the written consent of POWER.

1.5 Limitations and Data Gaps

ASTM Standard E 1527-13 requires that "data gaps" of a Phase I ESA be identified in the report. Data gaps are a lack of or inability to obtain information that may affect the results and conclusions of the Phase I ESA.

POWER has performed the Scope of Work set forth in our proposal dated April 28, 2021, in specific reliance on the understandings and agreements reached between POWER and AMP Transmission, LLC. POWER's scope of work was limited to that stated in the proposal.

Along with all of the limitations set forth in various sections of the United States Environmental Protection Agency (USEPA) 40 C.F.R. 312 Standards and Practices for All Appropriate Inquiries (AAI) – Final Rule approved November 1, 2005, and the ASTM International Standard Practice for ESAs (Standard E1527-approved by the USEPA on December 30, 2013), the accuracy and completeness of this report may be limited by the following:

- **Access Limitations** – The Survey Area includes a house and storage building. Access to these structures was not provided, and interiors of the buildings were not inspected.
- **Physical Obstructions to Observations** – No physical obstructions were encountered, with the exception of the access limitations described above.
- **Site Contact Knowledge** – Information was received from AMP Transmission and the City of Amherst. Questionnaires with questions about past use of property, presence of wells and septic systems and known environmental concerns were submitted to residential landowners in the Survey Area. Responses were received from two property owners, Joel and Marcia Miller and Christopher Bartish.
- **Outstanding Information Requests** – No information requests are outstanding.
- **Historical Data Source Failure** – Historical records were available dating back to 1901 (topographic maps), with aerial photography resources extending to 1934. Data gaps of more than five years were identified in the historical resources review, but this does not appear to significantly affect the understanding of the Site's history.
- **Resource Quality Limitations** – Limitations in the quality of data sources may have been encountered during preparation of this report. These limitations, if encountered, are described in relevant sections of this report.

- **Other** – Occupants or owners of adjacent properties were not interviewed.

Where required, the documents listed in the appendices were used as reference material for the completion of the Phase I ESA. Some of the information presented in this report was provided through existing documents and interviews. Although attempts were made, whenever possible, to obtain a minimum of two confirmatory sources of information, POWER in certain instances has been required to assume that the information provided is accurate.

Subsurface conditions were not field investigated and may differ from the conditions implied by the surficial observations. The potential existence of soil or groundwater contamination and waste emplacement, if any, was disclosed to POWER only by surficial indications, interviews, or regulatory records.

POWER's services in the development of this report were conducted, within the limits prescribed by the Agreement, in a manner consistent with that level of care and skill ordinarily exercised by members of the same professions currently practicing in the same locality under similar conditions and no other guarantee, warranty, or representation, either express or implied, is included or intended herein.

To qualify for innocent landowner, contiguous property owner, or bona fide prospective purchaser limitation from CERCLA liability, in addition to conducting AAI, the user of this Phase I ESA has the continued obligation of the following:

- Taking steps to stop new or continued releases.
- Complying with land use restrictions and providing legally required notices.
- Not impeding the effectiveness or integrity of institutional controls.
- Providing cooperation, assistance, and access to USEPA, state, or other parties conducting response actions or natural restoration of the property.
- Complying with CERCLA information requests and subpoenas.

Finally, the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations from CERCLA liability apply to federal (USEPA) actions only. They do not apply to potential state actions such as from the Bureau of Underground Storage Tank Regulations (BUSTR).

2.0 DESCRIPTION

2.1 Location

The Site includes 16.04-acres of land situated just south of a Norfolk and Southern Railway in Amherst, Lorain County, Ohio. The Site is situated in an urban area of mixed residential and commercial development. The western boundary of the Site is located 0.18-mile east-southeast of State Route 2 and is 1.40 miles east of Baumhart Road. The southeastern boundary of the Site is adjacent to Milan Avenue and is 1.6 miles north of Interstate 90 (Ohio Turnpike). The central business district of the City of Cleveland is located 29.3 miles northeast of the Site. The location of the Site is depicted on Figure 1 and the Site and the adjoining properties are presented on Figure 2. Adjoining land uses are described below.

- North – The Site is bounded to the north-northeast by the Norfolk and Southern railroad tracks, with residential properties on the opposite side of the tracks.
- East – KTM North America Inc., a distributor of motorcycles and motorcycle parts, is situated adjacent to the east of the Site.
- South – The Eagles Lodge and residential properties are situated to the south of the Site.
- West – Residential properties and wooded lands are located west of the Site.

2.2 Nature and Use of Property

The Site includes 16.04-acres of property comprised of portions of eight real estate parcels. The existing Amherst #2 69 kilovolt (kV) electric substation is situated in the northeastern corner of the Site, with a stormwater detention pond located west of the substation. The proposed project includes construction of an electric transmission line from an existing First Energy 138 kV line to the existing Amherst #2 69 kV substation, a distance of approximately 0.4-mile. The project will also include expansion of the substation.

3.0 PHYSICAL CHARACTERISTICS OF THE SITE

3.1 Topography

Figure 1 identifies the location of the Site on the United States Geological Survey (USGS) Vermilion East and Lorain, Ohio 7.5-minute topographic map. The Site is situated at an elevation of between approximately 695 and 701 feet above mean sea level (msl).

The southern portion of the Site is generally situated at a higher elevation than the northern portion of the Site, although a raised berm is present along the south side of much Norfolk Southern railway tracks. The topographic gradient in the area of the Site is to the north-northeast toward Millers Creek and the north toward Lake Erie.

Information provided by Environmental Data Resources (EDR) includes Federal Emergency Management Agency (FEMA) flood information as well as the United States Fish and Wildlife Service's National Wetland Inventory information. According to this information, the Site is not located within a flood zone and wetlands are not mapped at the Site (EDR 2021c).

3.2 Soils

Based on information provided by EDR, soils mapped at the Site include Jimtown sandy loam, Elnora loamy fine sand, Oshtemo sandy loam, and Quarries sandy loam (EDR 2021c).

Jimtown is mapped in the eastern portion of the Site. The sandy loam soils are somewhat poorly drained and exhibit slow infiltration rates. The soils have layers impeding downward movement of water and have moderately fine or fine textures. The soils exhibit a moderate corrosion potential for uncoated steel (EDR 2021c). The soils originate from outwash and occur on terrace landforms. The Jimtown is considered prime farmland if drained and is not a hydric soil (USDA 2020).

Elnora is mapped in areas located in the southeastern portion of the Site. The loamy fine sand is moderately well drained and exhibits moderate infiltration rates. The soils are deep and moderately deep and have moderately coarse textures. The corrosion potential for uncoated steel is low (EDR 2021c). The soils originate from glacial lake deposits and occur on beach ridges and longshore bars. The Elnora is not considered prime farmland and is not a hydric soil (USDA 2020).

Oshtemo is mapped in the east-central portion of the Site. The sandy loam is well drained and exhibits moderate infiltration rates. The soils are deep and moderately deep and have moderately coarse textures. The corrosion potential for uncoated steel is low (EDR 2021c). The soils originate from outwash and occur on terrace landforms. The Oshtemo sandy loam is considered prime farmland and is not a hydric soil (USDA 2020).

The western portion of the Site is mapped as Quarries sandy loam. The sandy loam is well drained and moderately well drained and exhibits moderate infiltration rates. The soils have moderately coarse textures. The hydric status of the soils is unknown and the corrosion potential for uncoated steel is not reported (EDR 2021c).

3.3 Geology

According to the Ohio Department of Natural Resources (ODNR) Geological Survey Physiographic Map of Ohio, the Site is situated in the Erie Lake Plain physiographic region. This region is characterized as an area with low topographic relief. Formed from an Ice-Age lake basin, the region is separated from present-day Lake Erie by shoreline cliffs. Major streams and deep gorges are common. Surficial materials include Pleistocene-age lacustrine silt, sand, clay and till. These deposits overly the sandstone and shale bedrock (ODNR 1998).

The USGS identifies the bedrock in the area of the Site as Devonian age that specifically includes the Berea Sandstone and Bedford Shale. The sandstone component includes thick, planar to lenticular bedding with minor interbedded shale (USGS 2006).

EDR identifies a water well log associated with a property located approximately 125 feet to the south of the south-southeastern portion of the Site at 1010 North Quarry Road. The well log indicates that sand was encountered to a depth of 11 feet below the ground surface, clay and sand was encountered at depths of between 11 and 18 feet, and shale was encountered at 18 feet below the ground surface to the total depth of the well at 35 feet below the ground surface. The log indicates that water was encountered at 18 feet below the ground surface in the sand (ODNR 2021).

3.4 Hydrogeology

The Site is located in area where water wells seldom exceed yields of three gallons per minute of groundwater. The impermeable deposits of clay overlying the shale bedrock are a poor source for groundwater. Dry wells that do not produce groundwater are common in this area. Deep wells may produce brackish or oily water (ODNR 1994).

As discussed in Section 3.3, a water well log associated with a nearby property indicates that groundwater was encountered in sand at a depth of 18 feet below the ground surface at the contact between the shale bedrock and the overlying unconsolidated deposits (ODNR 2021).

The topographic gradient in the area of the Site is to the north-northeast toward Millers Creek and the north toward Lake Erie. The topographic gradient may be indicative of the direction of groundwater flow. Groundwater in the area of the Site is interpreted to flow to the north and//or northeast, although drainage channels, groundwater pumping and other factors may alter this flow direction.

4.0 SITE HISTORY

4.1 Historic Resource Review

The objective of consulting historical sources is to develop a history of the previous uses of the Site and surrounding area, in order to evaluate the potential that past uses have resulted in RECs, HRECs, or CRECs in connection with the property. A summary of these resources is provided below, and a copy of this information is included in Appendix D.

4.1.1 Sanborn Fire Insurance Maps

Sanborn Fire Insurance Maps are maps of urban areas that were created by the Sanborn Company from the late 1800s until approximately the late 1980s. They were originally created to assist property insurers develop fire insurance rates for properties, and therefore provided details about development and property use, construction materials, and occupancy at sites.

There were no Sanborn Fire Insurance made available by EDR for the area of the Site for review.

4.1.2 Aerial Photographs

POWER reviewed aerial photographs provided by EDR from the years 1934, 1951, 1960, 1969, 1977, 1983, 1988, 1994, 2000, 2006, 2010, 2013 and 2017 (EDR 2021a). The information obtained from the historic aerial photography is presented in Table 1.

TABLE 1 AERIAL PHOTOGRAPH SUMMARY

YEAR	DESCRIPTION
1934	The eastern portion of the Site appears to be utilized as an orchard. A structure appears to be situated along the western edge of a gravel or unimproved drive (oriented north south) that traverses the Site and orchard. A second gravel or unimproved drive traverses the central portion of the Site. Areas of the Site north and east of the drive although not depicted as part of the orchard, appear cleared of trees and thick vegetation. The western portion of the Site appears heavily forested.

YEAR	DESCRIPTION
	The area south of the eastern portion of the Site is also utilized as an orchard. Areas south of the western portion of the Site are also heavily forested. The Norfolk and Southern railroad tracks are present on the aerial. Farmsteads and orchards are located north of the Site. Much of the surrounding area is utilized for agricultural purposes. Disturbances depicted further southeast of the Site appear associated with quarry activities.
1951	The Site and the surrounding areas appear mostly unchanged from the previous photograph. The structure previously depicted in the eastern portion of the Site within the orchard is no longer depicted. A linear utility corridor is depicted traversing the northwestern portion of the Site.
1960	The aerial image is of poor quality. The Site and the surrounding areas appear to be mostly unchanged from the previous photograph. The northeastern portion of the Site appears partially disturbed, it appears that the western portion of the orchard in the eastern portion of the Site may have been cleared or removed. The orchard remains depicted in the easternmost portion of the Site and in areas to the south. Quarry activities appear to have expanded in the area southeast of the Site.
1969	The aerial image is of poor quality. It appears that the western portion of the eastern area of the Site has been mostly reestablished as an orchard. Apparent vehicle tracks appear in the western portion of the Site. Commercial and residential development has occurred in areas east of the Site. Additional expansion has occurred at the quarry southeast of the Site. State Route 2 has been constructed west of the Site.
1977	The aerial image is of poor quality. The land in the western portion of the Site appears disturbed and portions of the forested area cleared. Residential development appears to have occurred along Apple Orchard Lane and Quarry Road in the areas south of the Site. Additional details related to development of the Site and the surrounding properties are unclear from review of the aerial photograph.
1983	The eastern portion of the Site remains depicted as an orchard. The forested areas previously depicted in the central and western portions of the Site appear to have been cleared of vegetation. Land disturbances (possible quarry or dumping related activities) and vehicle tracks are depicted in this area of the Site and in areas to the south of the Site.
1988	The aerial image is of poor quality. The land in the western portion of the Site appears very disturbed (possible quarry or dumping related activities). The linear ground feature (utility corridor) traversing the western portion of the Site appears disturbed in the areas northeast and southwest of the Site. An access drive is depicted from Quarry Road to the west-southwest, likely associated with the construction of the present-day radio/cellular tower in this general location south of the Site.
1994	The Amherst #2 substation appears on the aerial photograph. Vegetation is depicted west of the substation and associated roadway/drive; however, it is unknown if the trees are associated with the orchard previously described. Residential developed has occurred in the areas south of the east and east-central portions of the Site. The western portion of the Site appears less disturbed than in previous photographs, the land appears altered possibly due to quarry or dumping activities. Residential development has occurred in areas north of the Site.
2000	The aerial image is of poor quality. The western portion of the Site appears disturbed due to construction of the present-day residential structures. Land located east of the Amherst #2 substation appears disturbed, possibly related to construction activities.
2006	The development of the Site appears similar to present-day conditions. The residence and barn situated in the western portion of the Site have been constructed. Areas in the central and southernmost portion of the Site appear forested. The Eagles Lounge located adjacent to the south of the Site appears on the photograph and the southern portion of the KTM North America building appears adjacent to the southeast of the Site. The land adjacent to the east appears mostly revegetated from the previously described disturbances.
2010	The Site appears materially unchanged from the previous photograph except for an apparent low-lying area possible utilized for stormwater detention located to west of the Amherst #2 substation. The KTM North America building has been expanded to the north and the property is reflective of present-day conditions.
2013	The Site and the surrounding areas appear materially unchanged from the previous photograph.
2017	The Site and the surrounding areas appear materially unchanged from the previous photograph.

As described above, an orchard was present in the eastern portion of the Survey Area in the earliest aerial photograph dated 1934 through the 1983 aerial photograph. Lead and arsenic-containing pesticides were commonly used in orchards from the late 1800s until the mid-1900s. If used in the Survey Area, elevated concentrations of these metals may be present in soils that may be disturbed during construction. The past use of portions of the Survey Area as an orchard is identified as REC.

4.1.3 Historic Topographic Maps

POWER reviewed the Oberlin (1901 and 1903) and Vermilion (1903) 15-minute topographic maps and the Vermilion East (1959, 1969, 1979 and 2013) and Lorain (1960, 1969, 1979 and 2013) 7.5-minute topographic maps provided by EDR (EDR 2021d). The information obtained from review of the historic topographic maps is provided in Table 2.

TABLE 2 HISTORIC TOPOGRAPHIC MAP SUMMARY

YEAR	DESCRIPTION
1901	The western portion of the Site is not included in the area depicted on the map. The eastern portion of the Site appears developed with three residential structures situated along an unimproved north south oriented drive. The Norfolk and Southern railroad is present, situated along the northern portion of the Site and Milan Road is depicted south of the Site. The area south-southeast of the Site is identified as a quarry. A railroad line is depicted along the western edge of the quarry, extending north to connect with the Norfolk and Southern railroad line.
1903	No significant changes to the eastern portion of the Site or the surrounding areas are depicted on the map. A railroad spur is depicted in the western portion of the Site and Quarry Road is shown traversing the central portion of the Site. The railroad spur begins between 200 and 230 feet past the southern boundary of the Site. The railroad spur crosses the Norfolk and Southern railroad line and extends to the north-northwest approximately 0.65-mile before terminating at a topographic low point northwest of Cooper Foster Park Road.
1959	The railroad spur in the western portion of the Site is no longer depicted. The eastern portion of the Site appears to be utilized as an orchard. The residential structures previously depicted in this portion of the Site are no longer identified on the map. The western portion of the Site is depicted as forested. Quarry Road and Apple Orchard Lane are depicted on the map. The area south-southeast of the Site, south of Milan Road remains identified as a quarry. Overhead utility lines are depicted traversing the northwestern corner of the Site.
1969	No significant changes to the Site or the surrounding properties are depicted on the topographic map.
1979	Apple Orchard Lane appears as an unimproved road traversing the Site. A dwelling appears near the southwestern boundary of the Site near the west-central portion of the Site. Residential structures appear along Apple Orchard Lane and Quarry Road south of the Site and north of Milan Road, commercial structures and additional development has occurred in areas east and south-southeast of the Site.
2013	There are no structures depicted on the map. Information related to the use and development of the Site and the surrounding properties is unattainable by review of this topographic map.

4.2 County Auditor Information

The Site includes 16.04 acres of property contained in eight parcels of real property. Parcel information obtained from the Lorain County Auditor is provided below.

- Parcel Number 0500003106026 is comprised of 4.66 acres of property. The parcel is owned by the Amherst Eagles Inc. and is developed with a 12,248 square foot recreational building

and an asphalt parking lot. The Site-portion of this parcel includes a portion of the asphalt parking area and vegetated and forested land.

- Parcel Number 0500003106018 is comprised of one acre of which one acre is included in the Site. The parcel is owned by the City of Amherst and is developed with the Amherst #2 substation.
- Parcel Number 0500003106020 is comprised of 0.7-acre of property of which 0.7-acre is included in the Site. The parcel is owned by the City of Amherst and is developed with a stormwater pond associated with the Amherst #2 substation.
- Parcel Number 0500098000148 is comprised of 2.74 acres of property owned by Joel and Marcia Miller.
- Parcel Number 0500098000147 is comprised of 2.29 acres of property addressed 1009 Apple Orchard Lane and is owned by Christopher Bartish.
- Parcel Number 0500098000081 is comprised of 1.71 acres of owned by Marcia and Joel Miller. The property consists of vacant forested land situated along the northern-northeastern side of North Quarry Road.
- Parcel Number 05000098000085 is comprised of 16 acres of property owned by Susanne and Samuel Silva and developed with a residential structure and barn.
- Parcel Number 0500098000023 is comprised of 1.3 acres of property owned by the Ohio Edison Company.

4.3 Interviews

POWER contacted the City of Amherst Fire Department to request information about the Site related to fires, spills of hazardous substances or petroleum products, or other incidents at or near the Site requiring a department response. Mr. Chris Niehart, a member of the Amherst Fire Department, responded that the department has no records of fires, hazardous materials spills or other incidents requiring a department response to the Site.

POWER received responses to Owner Questionnaires from three landowners in the Survey Area, Christopher Bartish, Marcia and Joel Miller, and Suzanne and Samuel Silva. A copy of the questionnaire that was submitted and the answers received is provided in Appendix E. The response from the Millers indicated that they have owned the parcel that is part of the Survey Area since the 1980s and that they constructed a house in 1992 and a barn in 1993. Sanitary wastewater generated at the residence is discharged to a septic system, and utilities are provided by City of Amherst utilities. The questionnaire indicated no knowledge of environmental concerns or prior environmental investigations associated with the property. The responses received from the Bartish residence indicated that utilities are provided by the City of Amherst and Columbia Gas, that the property is developed with a house constructed in 2021, and that the property has been owned since 2018. This response also indicated no knowledge of environmental concerns or prior environmental reports. The responses received from the Silva residence indicated that the Sivas have owned the property since late 2018 and that it is developed with a house and a barn. Sanitary wastewater generated at the property is discharged to 2 septic systems. Ohio Edison provides electricity and the City of Amherst provides municipal water. A water well is also located near the barn. The response indicates no knowledge of environmental concerns or prior environmental reports.

4.4 Previous Reports

There were no previous environmental reports for the Site that were provided for review.

4.5 Title Records

ASTM Standard E1527-13 requires a review for the presence of environmental liens identified on the property title. The ASTM E1527-13 standard identifies a review of title records for environmental liens as a "user responsibility" (i.e., a responsibility of the person purchasing and using the Phase I ESA report). POWER's scope of work for this project did not include obtaining a chain of title review for the Site, and title information was not provided to POWER.

5.0 SITE INSPECTION

POWER representative Mr. Eric Riekert (Cincinnati, Ohio) conducted the site reconnaissance on May 11, 2021. At the time of the site reconnaissance, the skies were clear and exterior areas of the subject site were dry. On-site environmental concerns are discussed in the following subsections. Photographs collected during the Site visit are provided in Appendix B.

5.1 Structures, Roads, and Other Improvements

The Amherst #2 69 kV substation is located in the northeast portion of the Site, and a stormwater detention basin is located west of the substation. A paved access drive enters the Site from Milan Avenue. This driveway provides access to The Eagles Lodge located south of the Site. North Quarry Road provides access to the central and western portions of the Site, as shown in Figure 2. This road extends to a house and barn in the southwestern area of the Site. A parcel owned by First Energy houses an electric transmission line tower in the western portion of the Site. Access to this tower is provided by a gravel path that extends from North Quarry Road. Remaining area of the Site are undeveloped and wooded or vegetated in lawn grasses.

5.2 Chemical Substances and Petroleum Products

There were no chemical substances or petroleum products observed at the Site. As described previously, the interiors of a house and storage barn in the southwestern area of the Site were not inspected. Chemical substances and petroleum products may be present in these structures, but if present are likely used and stored in limited quantities commonly associated with a household. Mineral oil or some other dielectric fluid is used in equipment at the Amherst #2 substation. No evidence of leaks or releases from this equipment was observed from the substation perimeter fence.

5.3 Hazardous Waste

The Site was not identified by EDR as a registered generator of hazardous waste. No hazardous waste generating or disposal activities were observed on the Site.

5.4 Sumps, Pits, Wells

The Site was inspected for the presence of sumps, pits, surface impoundments, cisterns, oil-water separators, septic tanks, grease traps, or cesspools. Evidence of these features was not observed at the Site.

5.5 Storage Tanks

The Site was inspected for visual evidence of ASTs and USTs, including former tank supports or foundations, concrete vaults, fill caps, and vent pipes. Evidence of these features were not observed at the Site.

5.6 Stormwater

Stormwater that falls on the Site is managed via overland flow in the majority of the Site. Stormwater in the eastern area of the Site discharges to an existing detention pond.

5.7 Polychlorinated Biphenyls

The Site was inspected for suspected PCB-containing equipment such as electrical transformers and capacitors, fluorescent light ballasts, and hydraulic equipment. PCBs were domestically manufactured from 1929 until manufacturing was banned in 1979.

Electrical equipment at the existing Amherst #2 substation contains mineral oil or another dielectric fluid. This substation was constructed in the 1980s. Therefore, the presence of PCB-containing electrical equipment is unlikely.

5.8 Additional Observations

Trash and debris was observed in wooded areas of the Site. This consisted of a small boat, fence material, wooden blocks, restaurant food packaging and similar materials. A closed-top drum was also observed (see photograph #5 in Appendix B). This drum was empty, with no evidence (stained soils, odors or distressed vegetation) observed.

A circular cap set on a small circular concrete pad was observed along North Quarry Road (see photograph #10 in Appendix B). This cap appears to be an access port to a septic system, although it was not removed during the reconnaissance. Land surveying associated with the proposed project should carefully map existing utilities so that they can be avoided during construction.

6.0 REGULATORY RECORDS REVIEW

POWER retained EDR to conduct a search for facilities listed on environmental regulatory agency databases and located in the vicinity of the Site. This regulatory records search is based on information published by state and federal regulatory agencies and is used to evaluate if the Site or nearby properties are listed as having a past or present record of actual or potential environmental impact. Please note that regulatory listings include only those facilities which are known to the regulatory agencies at the time of publication to be: 1) contaminated, 2) in the process of evaluation for potential contamination, or 3) regulated by one or more environmental regulatory programs or

permits. Inclusion of a facility in a government database list does not necessarily indicate the presence of a REC.

The EDR report included a review of databases required by ASTM International Standard E1527-13 as well as additional databases. A complete description of the databases searched is provided in the EDR report. A copy of the information provided by EDR is attached in Appendix F and is subject to EDR's limitations and disclaimers. The results of the search (by number of facilities identified on each database) are summarized in Table 3 (EDR 2021c).

TABLE 3 SUMMARY OF REGULATORY DATABASE SEARCH

DATABASE	SEARCH RADIUS (MI)	IDENTIFIED ON SITE (Y/N)	TOTAL NUMBER IDENTIFIED
NPL	1.0	No	0
Proposed NPL	1.0	No	0
Delisted NPL	1.0	No	0
CERCLIS	0.5	No	0
CERC-NFRAP	0.5	No	0
US ENG Controls	0.5	No	0
US INST Controls	0.5	No	0
RCRA TSDFs	0.5	No	0
CORRACTS	1.0	No	0
RCRA Gen. LQG	0.25	No	0
RCRA Gen. SQG	0.25	No	0
RCRA Gen. VSQG	0.25	No	0
RCRA Gen. CESQG	0.25	No	0
ERNS	Site Only	No	N/A
FINDS	Site Only	No	N/A
State and Additional Records			
State Hazardous Waste	1.0	No	0
DERR	1.0	No	0
State Landfill	0.5	No	0
Historic Landfill	0.5	No	0
LUST	0.5	No	1
UST	0.25	No	1
RCRA-NonGen/NLR	0.25	No	1
SPILLS	Site Only	No	N/A
ENG CONTROLS	0.5	No	0
INST CONTROLS	0.5	No	0
VCP	0.5	No	0
VAPOR	0.5	No	0
DRYCLEANERS	0.25	No	0
Brownfields	0.5	No	0
Historical Auto Stations	0.25	No	0
Historical Cleaners	0.25	No	0

Notes: MI = miles; N/A = indicates not applicable, as the search radius was less than the corresponding distance.
Acronyms are defined at the beginning of this report in Acronyms and Abbreviations; Acronyms are defined where discussed in the sections below.

6.1 On-Site Listings

There were no listings identified by EDR associated with the Site.

6.2 Off-Site Listings

POWER reviewed the regulatory database report for listings located adjacent to, or potentially upgradient of the Site.

An aboveground storage tank (AST) owned by American Tower Corporation was reported at 1025 North Quarry Road, approximately 100 feet south of the Site. The EDR report identifies the status of this AST Permit Closed Out, and it was not observed during the site reconnaissance. No releases from the tank were indicated in the EDR report. Minor releases from the tank, if they occurred and were not reported to environmental regulatory agencies, are unlikely to have impacted the Site.

Midstate International MX Inc. located at 1115 Milan Avenue is identified in the Resource Conservation Recover Act (RCRA) Non Generator/No Longer Regulated (Non Gen/NLR) database. The property is located downgradient 0.101-mile southeast of the Site. Midstate International is identified as a non-generator of spent nonhalogenated solvents (F003). Midstate International is identified as a historic small quantity generator of waste in 1986. No violations are reported.

Amherst IGA Foodliner located at 1190 Milan Avenue is identified in the Leaking Underground Storage Tank (LUST), UST, and ARCHIVE UST databases. The property is located upgradient 0.117-mile south-southeast of the Site. The LUST related incident is associated with the removal of three gasoline USTs (one 10,000-gallon UST, one 6,000-gallon UST, and one 1,000-gallon UST) in 2000. The report indicates that a search for a responsible party for the USTs was inconclusive. BUSTR requires only responsible parties to address impacts from USTs, so failure to find a responsible party likely indicates that the tanks were out of service and left in place some years ago, then unearthed during construction in 2000. In accordance with BUSTR regulations, the party that discovered them in 2000 would be responsible for removal but not for collection and analysis of samples. Therefore, it is unclear if releases from the tanks occurred. However, based on the distance from the Site it is unlikely that releases, if they occurred, have impacted the Site. The facility currently operates one 12,000-gallon gasoline UST, one 4,000-gallon gasoline UST, and one 2,500-gallon kerosene UST that were installed in 2001; no indication of releases was included in the EDR report.

There are four unmapped listings identified in the EDR database report. Based on the presumed distance to these facilities and the regulatory status identified in the EDR report, they are unlikely to impact the Site.

7.0 POTENTIAL FOR VAPOR INTRUSION

ASTM E1527-13 indicates that a REC at a site can be caused by the release of vapors from contaminated soil or groundwater on or near the site. ASTM Standard E2600-15 establishes a process for conducting a vapor encroachment screening for a property. POWER completed an ASTM Standard E2600-15 Tier 1 Screening as part of this Phase I ESA.

A Tier 1 Screening consists of review of the environmental regulatory record information described earlier in this report (see Section 6.0) as well as site and surrounding property observations and other generated information to identify properties known or suspected to be impacted with chemicals of

concern. Chemicals of concern consist of compounds that are volatile and can migrate in groundwater or as vapors in the unsaturated subsurface.

The ASTM E2600 default area of concern was used for this review: the area of concern is 0.1-mile around the Site for petroleum chemicals of concern and 0.33-mile for non-petroleum chemicals of concern. POWER then reviewed other information such as current and intended use of the property and surrounding properties, site physical setting information, and known natural or man-made subsurface conduits to determine if a vapor encroachment condition exists at the Site.

7.1 On-Site Potential for Vapor Intrusion

There were no EDR listings associated with the Site which present vapor encroachment conditions.

7.2 Off-Site Potential for Vapor Intrusion

7.2.1 Petroleum Chemicals

POWER reviewed the EDR regulatory database report for facilities with reported releases from USTs within 0.1-mile of the Site. No evidence of releases was identified. Therefore, a vapor encroachment condition from petroleum compounds does not appear to be present.

7.2.2 Non-Petroleum Chemicals

POWER reviewed the EDR regulatory database report for properties identified as dry cleaners or other facilities which may currently or historically have used non-petroleum chemicals which could potentially create a vapor encroachment condition within 0.33-mile of the Site. A vapor encroachment condition from non-petroleum chemicals does not appear to be present.

8.0 FINDINGS AND CONCLUSIONS

The purpose of this Phase I ESA was to identify RECs associated with the Site and perform all appropriate inquiries concerning the subject Site in accordance with ASTM Standard E 1527-13 and 40 CFR Part 312. A REC is defined by ASTM Standard E 1527-13 as "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions."

POWER has performed a Phase I ESA of the 16.04-acre Survey Area located in Amherst, Lorain County, Ohio in conformance with the scope and limitations of ASTM Practice E1527-13. Any exceptions to or deletions from this practice are described in Sections 1.5 and 8.0 of this report.

POWER has chosen an appropriate level of effort consistent with ASTM International Standard E1527-13 for evaluating the status of the property. Based on the scope of activities conducted, no HRECs, CRECs or de minimis issues were identified.

POWER has identified one REC in connection with the Survey Area. The eastern portion of the Survey Area was formerly used as an orchard from 1934 or earlier until at least 1983. Lead and

arsenic-containing pesticides were commonly used in orchards from the late 1800s until the mid-1900s. If used in the Survey Area, elevated concentrations of these metals may be present in soils that will be disturbed during construction. POWER recommends limited sampling and analysis of soils of the Survey Area to evaluate for the presence of elevated concentrations of metals.

9.0 LITERATURE CITED

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_____. 2021d. Certified Sanborn Map Report. April 30, 2021.

Ohio Department of Natural Resources (ODNR). 1998. Physiographic Regions of Ohio. https://geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Misc_State_Maps&Pubs/physio.pdf. Accessed May 2021.

_____. 1986. Physiographic Regions of Ohio.

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ENVIRONMENTAL PROFESSIONAL STATEMENT

We declare that to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in 40 CFR 312.10. We have the specific qualifications based on education, training, and experience to assess the nature, history, and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

POWER ENGINEERS, INC.

Prepared by:

Eric A. Riekert
Environmental Specialist
Department Manager

Lindsey Branham
Environmental Specialist

July 8, 2021

FIGURES

FIGURE 1 SITE LOCATION ON A 7.5-MINUTE USGS TOPOGRAPHIC MAP

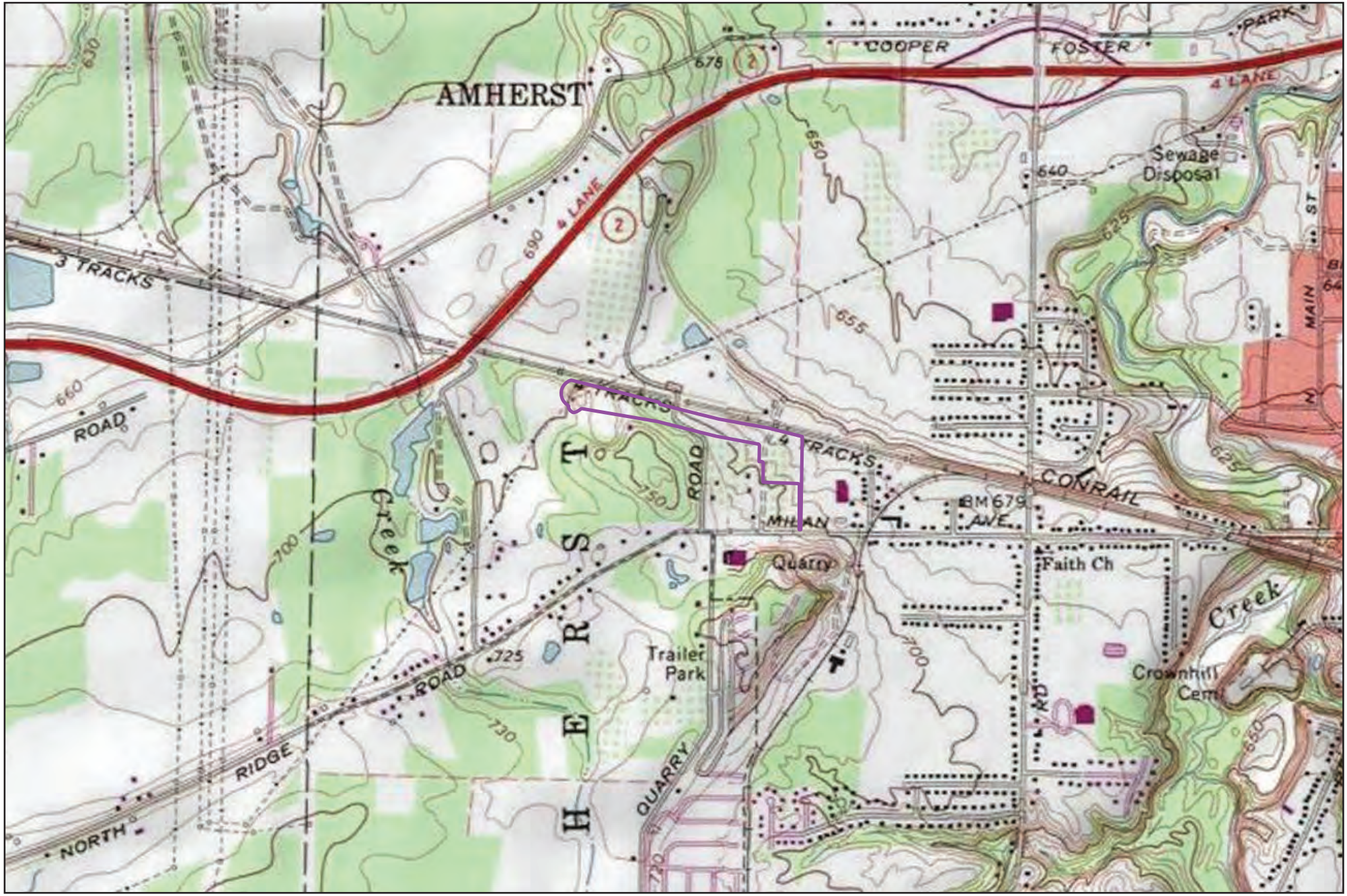


Figure 1
Survey Area on USGS Topo
Lorain County, Ohio

0 600 1,200
Feet

1" = 1,200'

Map 1 of 2

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS
AMP TRANSMISSION

Date: 5/25/2021; Author: jhumiston; Project: 167911

FIGURE 2 SITE MAP

Survey Area
Existing Amherst Substation
Road
Parcel Boundary

Figure 2
Survey Area on Imagery
Lorain County, Ohio

0 250
Feet
1" = 250'
Map 1 of 1

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS
AMP TRANSMISSION

APPENDIX A POWER PERSONNEL QUALIFICATIONS

LINDSEY BRANHAM

GEOLOGIST/ENVIRONMENTAL SPECIALIST

YEARS OF EXPERIENCE

7

EDUCATION

> B.S., Geology, University of Akron

SPECIAL TRAINING

> OSHA 40-Hour HAZWOPER Training
> OSHA 8-Hour HAZWOPER Refresher (annual)
> OSHA 10-Hour Construction Outreach Training
> Marathon Petroleum Contractor Safety Training (annual)

LICENSING

> Geologist in Training, Kentucky

AREAS OF EXPERTISE

> Phase I Environmental Site Assessments
> Phase II Environmental Site Assessments
> BUSTR – regulated UST closures, investigations, corrective actions
> Aquifer Testing
> Soil Sampling
> Low Flow Groundwater Sampling
> Purge and Collect Groundwater Sampling
> Soil Vapor Sample Collection
> SubSlab Vapor Sample Collection
> AutoCAD

EXPERIENCE SUMMARY

Lindsey Branham is a geologist and environmental specialist in the Site Assessment, Remediation & Compliance Group at POWER Engineers. She is responsible for conducting Phase I and Phase II Environmental Site Assessments (ESAs), due diligence investigations related to property acquisitions or divestures, underground storage tank (UST) closures and corrective action oversight. She is responsible for reviewing historical data, conducting site inspections, conducting interviews with property owners and regulatory agency personnel, identifying Recognized Environmental Concerns (RECs), and completing Phase I ESAs. She provides environmental oversight during Phase II ESA and BUSTR corrective action activities including the installation of soil borings and monitoring wells.

United Dairy Farmers, Multiple Sites, Ohio, Kentucky, Indiana

Works within BUSTR rules to provide environmental support for the client. Provides oversight during underground storage tank system removal.

Provides assistance for sites that have been required by BUSTR for additional corrective action. On site personnel responsible for overseeing drillers to install monitoring wells and soil borings and to collect appropriate environmental samples. Responsible for properly developing newly installed monitoring wells and collecting groundwater samples.

Has completed multiple Phase I ESAs as part of due diligence during property acquisitions and for capital financing support.

Metropolitan Sewer District of Greater Cincinnati - Multiple Projects, Ohio

Provided environmental support for planned sewer upgrades to separate the combined sewer system within the City of Cincinnati. Provided environmental due diligence support for multiple projects.

Completed a Phase I ESA of seventeen parcels in the Wooden Shoe Hollow area, as part of CSO 217/483 Phase B.

Completed a Phase I Environmental Site Assessment along the Holliday Street right-of-way;

Completed a Phase I & Phase II ESA of 2740-2750 Beekman Street, as part of the North Fairmont Bioswale.

Completed a Phase II ESA as part of CSO 217-483 Source Control Phase A.

ODOT, Phase I ESAs & Environmental Screenings, Ohio

Responsible for completing ODOT Environmental Screenings for WAR-GRE-42 in conjunction with culvert replacements. Reviewed aerials provided ODOT, contacted the local health department and fire department to inquire about environmental issues and visited each culvert location and any facilities identified in the regulator database review as a potential REC.

Completed a Phase I Environmental Site Assessment for HAM-279-0.00 in conjunction with proposed road improvements along Sycamore Road in Hamilton County. Six sites had been identified in the Environmental Screening as possible RECs. Compiled information for the complete Phase I ESA, visited the sites, reviewed BUSTR files and regulatory database information.

Quarterly Groundwater Monitoring, Surface Coal Mine, Indiana

Performs quarterly low-flow groundwater sampling and surface water sampling in efforts to monitor spoil areas for movement of buried materials through the subsurface. Performs quarterly groundwater and surface water sampling for the active mining operations to monitor groundwater and surface water quality in efforts to determine if mining activities have impacted the surrounding environment.

CenterPoint Energy, Environmental Due Diligence, Texas

Responsible for assisting with over 50 Environmental Site Assessments associated with a transmission corridor project located northwest of Houston, Texas.

Pipeline Corridor Environmental Site Assessment, Ohio

Completed a Phase I ESA of a proposed pipeline corridor located in northwestern Ohio. Identified facilities within regulatory databases that were in close proximity to the proposed corridor and requested appropriate files and information from state agencies.

Multiple Projects, Environmental Due Diligence, U.S.

Responsible for completion of Phase I Environmental Site Assessments for various clients to identify Recognized Environmental Conditions on multiple commercial, industrial, and proposed residential properties. Projects have been completed in Ohio, Indiana, Iowa, Kentucky, Florida, Tennessee, and Nevada. Completed multiple Phase II Environmental Site Assessments at sites which were found to have Recognized Environmental Conditions in the Phase I ESA report. Manages and documents field activities during soil boring and monitoring well installation.

ERIC A. RIEKERT

ENVIRONMENTAL SPECIALIST / DEPARTMENT MANAGER

YEARS OF EXPERIENCE

32

EDUCATION

> M.B.A., Coursework, University of Dayton
> B.S., Chemistry, Miami University, 1989

AREAS OF EXPERTISE

> Project Management
> Environmental Permit and Regulatory Program Compliance
> Environmental Liability Identification and Estimating
> Contaminant Investigation
> Remediation Planning and Oversight
> Waste Management
> Environmental Management System Auditing
> Health & Safety Compliance

EXPERIENCE SUMMARY

Mr. Riekert is an environmental scientist with more than 3 decades of experience, first working in industry then in environmental consulting. He brings broad environmental compliance experience as well as contaminant investigation, remediation and waste management. Mr. Riekert also has extensive experience in industrial portfolio due diligence and environmental liability cost estimating and has managed site studies and environmental permitting for several power generation facilities.

Prior to environmental consulting, Mr. Riekert was responsible for environmental compliance at a coal-fired power plant. In this role, he was responsible for compliance with Ohio EPA drinking water regulations, air monitoring, NPDES monitoring and reporting, permit renewals, and environmental and safety training.

Environmental Compliance Experience

Industrial Facility Regulatory Registry and Audit, Georgia

Project manager for environmental compliance assistance at two facilities in Georgia. The project included identification of all state and federal environmental and health & safety regulatory requirements applicable to the facility, summary of the requirements in a regulatory register, and an audit of facility compliance with the requirements. Provide quarterly updates to the regulatory registry.

Seller's Environmental Due Diligence, Multiple Projects, Multiple States

Project Manager and lead technical representative for several projects in support of an owner's pre-sale environmental due diligence. The projects were conducted in order to identify and quantify environmental, health, and safety liabilities so these could be remedied and/or disclosed to prospective purchasers. The confidential clients included paint and adhesives manufacturers in Georgia and Massachusetts; textile and geotextile manufacturers in Virginia, South Carolina, and North Carolina; industrial equipment manufacturers in New York, Illinois, and Kansas; and a light-emitting diode manufacturer in California. The scope of work at these sites included Phase I Environmental Site Assessments to identify Recognized Environmental Conditions; reviews of compliance with environmental permits, plans, and regulations; and reviews of industrial hygiene, health, and safety programs, regulatory compliance and performance at the facilities.

Environmental Auditing and Compliance Assistance, Multiple Confidential Sites, New York, Iowa, Indiana, Wisconsin, Ohio

Project Manager for environmental compliance auditing and environmental

management system auditing at numerous sites in New York, Iowa, Indiana, Wisconsin and Ohio. Projects have included audits to assess conformance with internal environmental policies, as well as both limited and in-depth environmental compliance audits at manufacturing facilities. Audited manufacturing facilities included a boiler manufacturer, finish stripping and refinishing facilities, and a hazardous waste disposal facility prior to shipment of a hazardous metal sludge.

Prepared Tier II Chemical Inventory Reports for industrial facilities in Ohio, Indiana, Illinois, Florida, Georgia and California.

Prepared Biennial Hazardous Waste Reports for industrial facilities in Ohio.

Industrial Facility Compliance Assistance, Guelph, Ontario, Flowserve

Project manager and lead technical representative to evaluate environmental compliance at a pump manufacturer recently acquired by Flowserve. The evaluation was completed after acquisition because of very short due diligence timelines. Project included evaluation of compliance with Canadian and Ontario air, water and waste regulations as well as worker protection standards. A comprehensive report that detailed compliance requirements was prepared, as were Job Hazard Analyses for each of the processes completed at the facility.

Industrial Acquisition Environmental Due Diligence, Multiple Projects in Texas, New Mexico, and Idaho (SGS)

Project manager and lead technical resource for pre-purchase environmental due diligence of multiple feed mills in Texas, New Mexico, and Idaho. The projects included a Phase I Environmental Site Assessment (ESA), Phase II ESAs at sites were concerns were identified during the Phase I ESA, and a review of environmental regulatory compliance. Also prepared cost estimates to address environmental liabilities identified at the sites. These liabilities included lack of required regulatory plans (SPCC and other plans), annual reports (Tier II reports), and impacted soil.

Industrial Acquisition Environmental Due Diligence, Texas (Flowserve)

Project manager for pre-purchase environmental / health & safety due diligence in Corpus Christi, Texas. Scope of work included a Phase I ESA, Phase II ESA and preparation of cost estimates to address impacted soil identified during the Phase II ESA. The project also included an environmental regulatory compliance review and a review of health and safety performance of the facility.

Waste Management, Site Investigation and Remediation Experience

Facility Expansion Waste Management, Arconic, California

Arconic wished to expand a facility in Rancho Cucamonga, California. The site was built on industrial fill and had little suitable staging area for placement of construction-related excavated materials. Therefore, client

desired to "live load" materials for off-site disposal if needed. POWER prepared a Waste Management Plan detailing federal and State of California waste management requirements as well as local soil reuse standards. Project Manager for subsequent investigation at the site, which included soil samples from proposed excavation areas and analysis for constituents of concern so the materials could, up front, be characterized as a federal hazardous waste, a California hazardous waste, non-hazardous but not suitable for reuse, or non-hazardous but not suitable for reuse. The project concluded with a detailed report that included waste management recommendations, then contacted client-approved waste disposal facilities to prepare waste profiles. When construction plans changed, POWER then provided on-site oversight and sampling to quickly characterize materials.

Industrial Acquisition Environmental Due Diligence, Niagara Falls, NY and Tiel, Netherlands (Confidential Client)

Project Manager for pre-acquisition environmental due diligence for a confidential client interested in purchasing manufacturing facilities in Niagara Falls, NY and Tiel, Netherlands. Served as the primary technical representative for the Niagara Falls, NY site. The site was impacted with mercury from a past owner's activities as well as with technologically enhanced naturally occurring radioactive material (TENORM) from the placement of radioactive ore processing wastes as fill at the site. Reviewed investigation documents and remediation progress reports and prepared cost estimates for remediation of the mercury and TENORM. The scope of work also included a review of the site's environmental compliance.

Decontamination and Waste Management at Facility Closure, Arconic, Baltimore, Maryland

Project Manager for project involving decontamination and waste management in order to close an industrial facility. POWER served as an owner's representative and helped client select and manage a contractor. Responsibilities included preparation of a Waste Management Plan, coordination with the client and decontamination contractor to ensure that waste were properly characterized, and oversight of the contractor during facility decontamination. The facility included several below-grade tunnels with up to 3 feet of oily water in them, as well as lubricants in dozens of machines, cooling water, and partially-full tanks. The project also required that years of accumulated materials be characterized and disposed, including paints, solvents, explosive metal powders and other materials.

YSI Incorporated, Investigation and Remediation, Ohio

Project Manager for contaminant investigation, remediation planning, and remediation implementation. Activities at the site are being conducted as required by an Administrative Order as well as a RCRA Consent Order from Ohio EPA. Prepared work plans, managed investigation and remediation activities, conducted groundwater modeling, and was the project manager and principal author of a RCRA Facility Investigation. On behalf of the client, presented project updates to community groups and the Ohio EPA. Remediation of impacted soil and groundwater has been completed. The conditions of the Administrative Order have been met and the order has been revoked. Conditions of the RCRA Order have been met and revocation of the order is pending.

Michelin North America, Former Manufacturing Site Investigation and Remediation, Michigan

Technical Representative for Michelin North America, one of several responsible parties at a brownfields site in Detroit, Michigan. This 43-acre site located on the Detroit River was historically used as a manufactured gas plant as well as for tire manufacturing, ammonia production, and metalworking. Coordinated with other PRP technical and legal representatives and the current property owner (the City of Detroit) to design investigations and remediation work plans. Reviewed investigation data to identify impacts attributable to various PRPs. In coordination with other responsible parties, retained a firm to design the remediation project including a new seawall to allow excavation up to 30 feet deep adjacent to the river and to prepare construction bid specifications. The approximately $35 million remediation project was recently completed and resulted in an Unrestricted Use No Further Action ruling from the State of Michigan.

Transcontinental Gas Pipe Line, Contaminant Investigation and Remediation, Georgia

Project Manager for the concurrent assessment, delineation, and remediation of polychlorinated biphenyl (PCB), petroleum hydrocarbon, arsenic, chromium, lead, and mercury contamination at a 145-acre natural gas compressor station. This project involved 30 weeks of active remediation, followed by agency meetings, several site visits to conduct additional sampling and analysis, and closure reporting. Served as project manager responsible for the technical, staff, and budget and administrative oversight of the project, which included up to nine direct employees and up to 25 remediation contractor employees. Responsible for planning remediation activities with facility personnel to avoid impacts to the active facility.

SLLI, Environmental Investigation, Remediation, Waste Management and Permitting, Tennessee

Project Manager for ongoing investigation and remediation activities at a 1500-acre site in Tennessee. The site is a former phosphate mine that also included a phosphate ore processing area later used for secondary aluminum smelting, a furnace operation to produce highly reactive and unstable elemental phosphorus (white phosphorus), and a pesticide production plant. An initial Phase I ESA included review of tens of thousands of pages of internal documents produced by former industrial occupants of the site as well as State of Tennessee and U.S. EPA records, and concluded by identifying concerns in more than 20 areas of the site. Remediation of several contaminants has occurred since 2012. 2017 through 2019 remediation activities involved tree removal and significant surface water diversion in order to remove impacted sediment in a marsh. These activities require permits from the U.S. Army Corps of Engineers as well as the State of Tennessee. Primary preparer of wetland permit applications that were submitted to the Corps and the State. The Corps permit application also required concurrence from the U.S. Fish and Wildlife Service and State Historic Preservation Office that the proposed activities would not affect endangered species and cultural resources. Endangered species concurrence required consultation with the Service and ultimately a contribution to the Tennessee Imperiled Bat Conservation Fund. State Historic Preservation

Office concurrence required preparation of a cultural resources evaluation for the site. The site is believed to contain a Cherokee Nation Trail of Tears path. Although the entire length of the path was later mined, this finding required the Corps to coordinate with 13 Native American tribes.

Project Manager and primary preparer of Corps and State of Tennessee permit applications for dredging of sediment from a 70-acre lake, installation of a sedimentation basin upstream of the lake, and removal of four dams from a creek downstream of the lake. The dams downstream of the lake have been removed, while the lake dredge project is pending the outcome of litigation between the client and an off-site party.

Project Manager for site evaluation and preparation of a Stream Mitigation Bank prospectus for submittal to the Tennessee Inter-Agency Review Team. The owner of this 1500-acre site is considering establishment of a mitigation bank at this property. Streams on the site total more than 19,000 feet in length and, based on the past mining history of the property, are degraded and offer ample opportunity for improvement and ecological lift. Coordination with the Inter-Agency Review Team to evaluate regulatory and economic feasibility is ongoing.

Project Manager for evaluation of TENORM in two areas of the site. POWER completed a risk assessment for these areas assuming future industrial and recreator exposures. Material from one area was relocated to an on-site consolidation area based on these results.

Polychlorinated Biphenyl (PCB) Investigation and Remediation, Multiple Sites, Ohio and Tennessee

Project Manager or technical team leader for investigation of PCB impacts at numerous industrial buildings from the past use of PCB-containing lubricants and paint, including an automotive supplier in northwestern Ohio, a shuttered lawn equipment manufacturer in northeast Ohio, several buildings at a jet engine manufacturing facility in Ohio scheduled for demolition. Planned and /or managed the remediation of PCB impacts in soils, sediment, and building surfaces at several sites including a paint and adhesive manufacturing facility in Cincinnati and a former pesticide manufacturing facility in Tennessee.

Facility Siting and Permitting

Dayton Power and Light, Environmental Siting and Permitting, Ohio

Project Manager for environmental siting studies and associated environmental permitting for utility projects in Ohio. Principal author of *Application for a Certificate of Environmental Compatibility and Public Need*, submitted to the Ohio Power Siting Board (OPSB) for six sites. A total of six applications were prepared from among 10 sites screened. Each of these applications included a review of existing conditions, and an analysis of impacts to ecological resources, cultural resources, and surface and ground water. Each application also assessed the proposed facility's adherence to existing community land use plans, and its impact on noise levels at nearby receptors. Managed less-intensive siting and permitting studies for utility projects in other Midwestern States, including Kentucky, Indiana, Illinois, and Michigan.

APPENDIX B SITE PHOTOGRAPHS

AMP Transmission, LLC
Amherst #2 Substation Expansion and 138 kV Transmission Line Project,
Lorain County, Ohio

Photographs by POWER Engineers, Inc.

Photograph 1: View of the existing Amherst #2 substation in the northeastern area of the Site.	
Photograph 2: View of KTM America warehouse at center-right of photograph, with the existing Amherst #2 substation at the left side of the photograph.	

AMP Transmission, LLC
Amherst #2 Substation Expansion and 138 kV Transmission Line Project,
Lorain County, Ohio

Photographs by POWER Engineers, Inc.

Photograph 3: View of stormwater detention basin located west of the Amherst #2 substation.	
Photograph 4: Typical view of forested areas of the Site.	

AMP Transmission, LLC
Amherst #2 Substation Expansion and 138 kV Transmission Line Project,
Lorain County, Ohio

Photographs by POWER Engineers, Inc.

Photograph 5: View of typical trash observed on the Site. This photograph shows an empty drum and several wooden blocks.	
Photograph 6: Photograph of a small boat and other debris observed on the Site.	

AMP Transmission, LLC
Amherst #2 Substation Expansion and 138 kV Transmission Line Project,
Lorain County, Ohio

Photographs by POWER Engineers, Inc.

Photograph 7: View of forested area of the Site, with a residential property behind.	
Photograph 8: View of railroad tracks that bound the Site on the north, with an overhead waterline that crosses over the rails.	

AMP Transmission, LLC
Amherst #2 Substation Expansion and 138 kV Transmission Line Project,
Lorain County, Ohio

Photographs by POWER Engineers, Inc.

Photograph 9: View of apparent bee boxes in the eastern, unforested area of the Site.	
Photograph 10: View along North Quarry Road, which traverses western portions of the Site.	

AMP Transmission, LLC
Amherst #2 Substation Expansion and 138 kV Transmission Line Project,
Lorain County, Ohio

Photographs by POWER Engineers, Inc.

Photograph 11: View of First Energy transmission tower and transmission line, at the western terminus of the Site.	
Photograph 12: View of warning post identifying the location of buried fiber optic cable along northern portion of the Site, with railroad tracks that bound the Site to the north in the background.	

APPENDIX C USER QUESTIONNAIRE

To comply with ASTM International Standard E1527-13 and to qualify for one of the Landowner Liability Protections offered under U.S. EPA's All Appropriate Inquiry regulations, the user of a Phase I ESA (the client or a client representative) must conduct certain inquiries. These inquiries are listed below. Please provide this information to POWER Engineers for inclusion in the Phase I ESA report.

1. Did a search of recorded land title records (or judicial records, where appropriate) identify any environmental liens filed or recorded against the property under federal, state, local, or tribal law?

2. Did a search of recorded land title records (or judicial records where appropriate) identify any activity use limitations (AULs) such as engineering controls, land use restrictions, or institutional controls that are in place and/or have been filed against the property under federal, state, local, or tribal law? If yes, please describe.

3. Do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupant of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business? If yes, please describe.

4. Does the purchase price being paid for this property reasonably reflect fair market value? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property?

5. Are you aware of commonly known or reasonable ascertainable information about the property that would help the environmental professional to identify conditions that indicate releases or threatened releases of hazardous substances or petroleum products? For example:

    a) Do you know the past uses of the property? If yes, please describe.

    b) Do you know of specific chemicals that are present or were once present at the property? If yes, please describe.

c) Do you know of spills or other chemical releases that have taken place at the property? If yes, please describe.

d) Do you know of any environmental cleanups that have taken place at the property? If yes, please describe.

6. Based on your knowledge and experience related to the property are there any obvious indicators that point to the presence or likely presence of releases at the property?

In addition to the information requested above, please provide copies of all available reports, documents, correspondence, and other information that provides information about the environmental condition of the property.

Completed by:

Print Name:_____

Title:_____

Signature: Scott Kiesewetter

Date:_____

APPENDIX D HISTORICAL SOURCES

Amherst #2

1161 Milan Avenue

Amherst, OH 44001

Inquiry Number: 6474298.8

May 03, 2021

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

05/03/21

Site Name:

Amherst #2
1161 Milan Avenue
Amherst, OH 44001
EDR Inquiry # 6474298.8

Client Name:

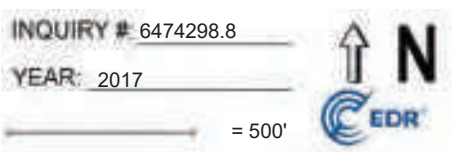
Power Engineers
11733 Chesterdale Road
Cincinnati, OH 45246
Contact: Lindsey Branham

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

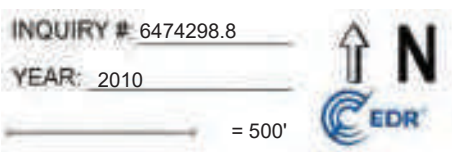
Search Results:

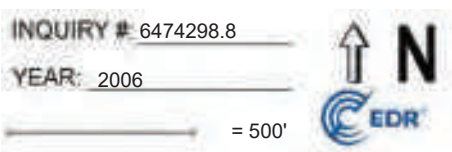
Year	Scale	Details	Source
2017	1"=500'	Flight Year: 2017	USDA/NAIP
2013	1"=500'	Flight Year: 2013	USDA/NAIP
2010	1"=500'	Flight Year: 2010	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
2000	1"=750'	Flight Date: September 29, 2000	USGS
1994	1"=500'	Acquisition Date: January 01, 1994	USGS/DOQQ
1988	1"=750'	Flight Date: April 12, 1988	USGS
1983	1"=500'	Flight Date: May 10, 1983	USDA
1977	1"=1000'	Flight Date: March 11, 1977	USGS
1969	1"=500'	Flight Date: March 18, 1969	USGS
1960	1"=500'	Flight Date: May 16, 1960	USGS
1951	1"=500'	Flight Date: May 13, 1951	USDA
1934	1"=500'	Flight Date: September 23, 1934	USDA

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.


INQUIRY #: 6474298.8
YEAR: 2017
= 500'
N
EDR


INQUIRY #: 6474298.8
YEAR: 2013
= 500'
N
EDR

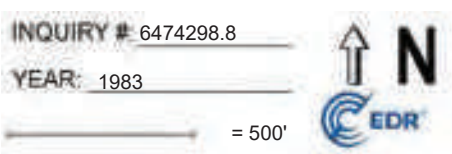

INQUIRY #: 6474298.8
YEAR: 2010
= 500'
N
EDR


INQUIRY #: 6474298.8
YEAR: 2006
= 500'
N
EDR


INQUIRY #: 6474298.8
YEAR: 2000
= 750'
N
EDR


INQUIRY #: 6474298.8
YEAR: 1994
= 500'
N
EDR


INQUIRY #: 6474298.8
YEAR: 1988
= 750'
N
EDR


INQUIRY #: 6474298.8
YEAR: 1983
= 500'
N
EDR


INQUIRY #: 6474298.8
YEAR: 1977
= 1000'
N
EDR


INQUIRY #: 6474298.8
YEAR: 1969
= 500'
N
EDR


INQUIRY #: 6474298.8
YEAR: 1960
= 500'
N
EDR


INQUIRY #: 6474298.8
YEAR: 1951
= 500'
N
EDR


INQUIRY #: 6474298.8
YEAR: 1934
= 500'
N
EDR

Amherst #2

1161 Milan Avenue

Amherst, OH 44001

Inquiry Number: 6474298.3

April 30, 2021

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

04/30/21

Site Name:

Amherst #2
1161 Milan Avenue
Amherst, OH 44001
EDR Inquiry # 6474298.3

Client Name:

Power Engineers
11733 Chesterdale Road
Cincinnati, OH 45246
Contact: Lindsey Branham

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Power Engineers were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 7350-4FDC-84B7

PO # 167911.02.02

Project Phase I ESA - AMP Amherst #2

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 7350-4FDC-84B7

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

Limited Permission To Make Copies

Power Engineers (the client) is permitted to make up to FIVE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

Amherst #2
1161 Milan Avenue
Amherst, OH 44001

Inquiry Number: 6474298.4
April 30, 2021

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

04/30/21

Site Name:	Client Name:
Amherst #2	Power Engineers
1161 Milan Avenue	11733 Chesterdale Road
Amherst, OH 44001	Cincinnati, OH 45246
EDR Inquiry # 6474298.4	Contact: Lindsey Branham

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Power Engineers were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:

P.O.# 167911.02.02

Project: Phase I ESA - AMP Amherst #2

Coordinates:

Latitude:	41.401509 41° 24' 5" North
Longitude:	-82.251373 -82° 15' 5" West
UTM Zone:	Zone 17 North
UTM X Meters:	395397.80
UTM Y Meters:	4584085.42
Elevation:	702.42' above sea level

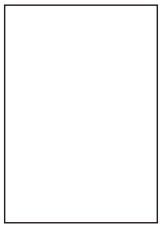
Maps Provided:

2013
1979
1969
1959, 1960
1903
1901

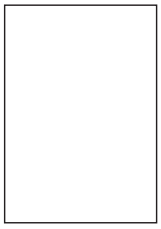
Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2013 Source Sheets



Vermilion East
2013
7.5-minute, 24000



Lorain
2013
7.5-minute, 24000

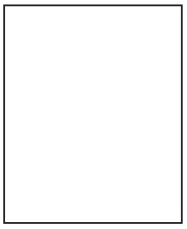
1979 Source Sheets

Lorain
1979
7.5-minute, 24000
Aerial Photo Revised 1977

Vermilion East
1979
7.5-minute, 24000
Aerial Photo Revised 1977

1969 Source Sheets

Lorain
1969
7.5-minute, 24000
Aerial Photo Revised 1958



Vermilion East
1969
7.5-minute, 24000
Aerial Photo Revised 1969

1959, 1960 Source Sheets

Vermilion East
1959
7.5-minute, 24000
Aerial Photo Revised 1956

Lorain
1960
7.5-minute, 24000
Aerial Photo Revised 1958

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1903 Source Sheets

Oberlin
1903
15-minute, 62500

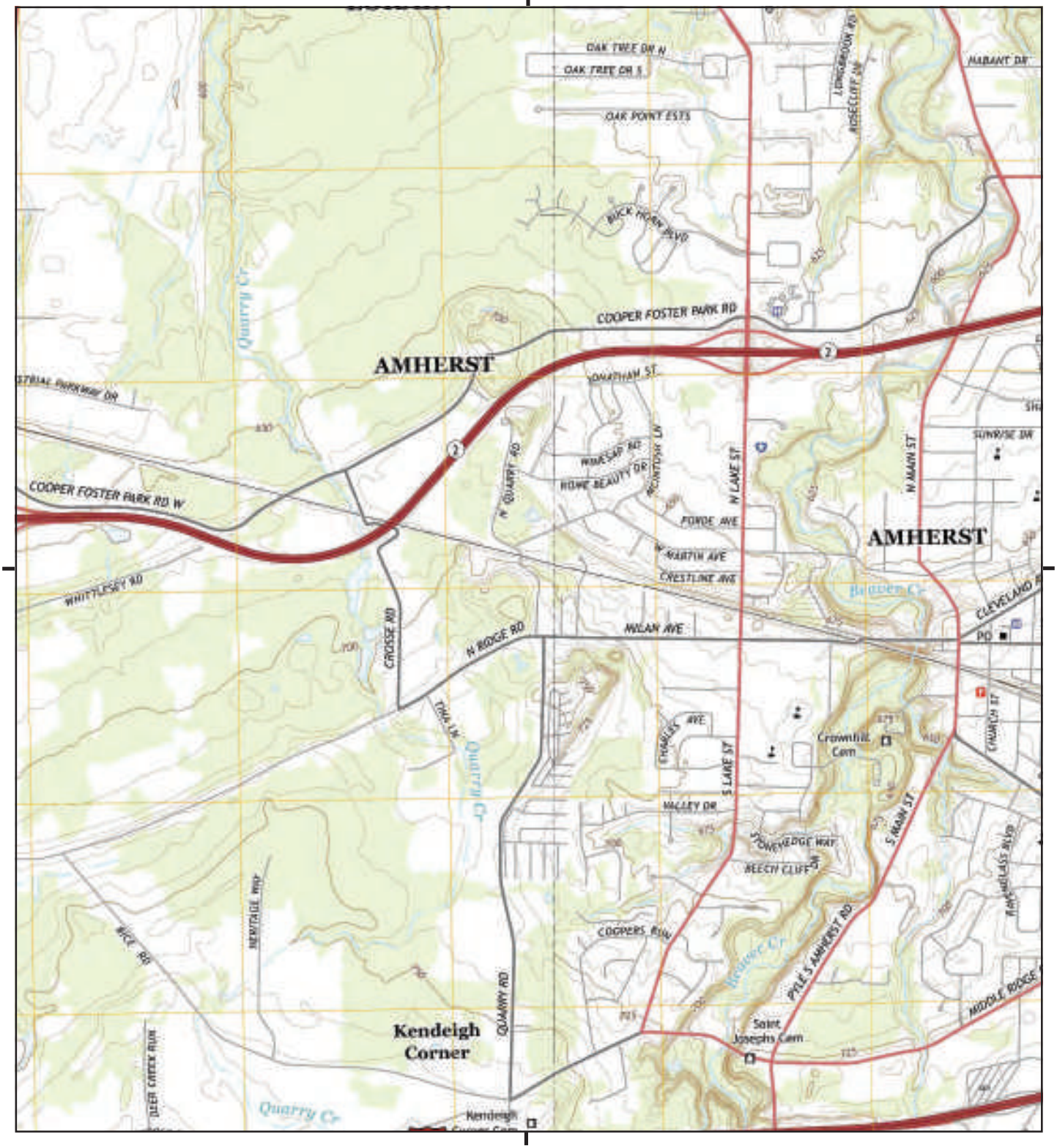
Vermilion
1903
15-minute, 62500

1901 Source Sheets

Oberlin
1901
15-minute, 62500

Historical Topo Map

2013



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

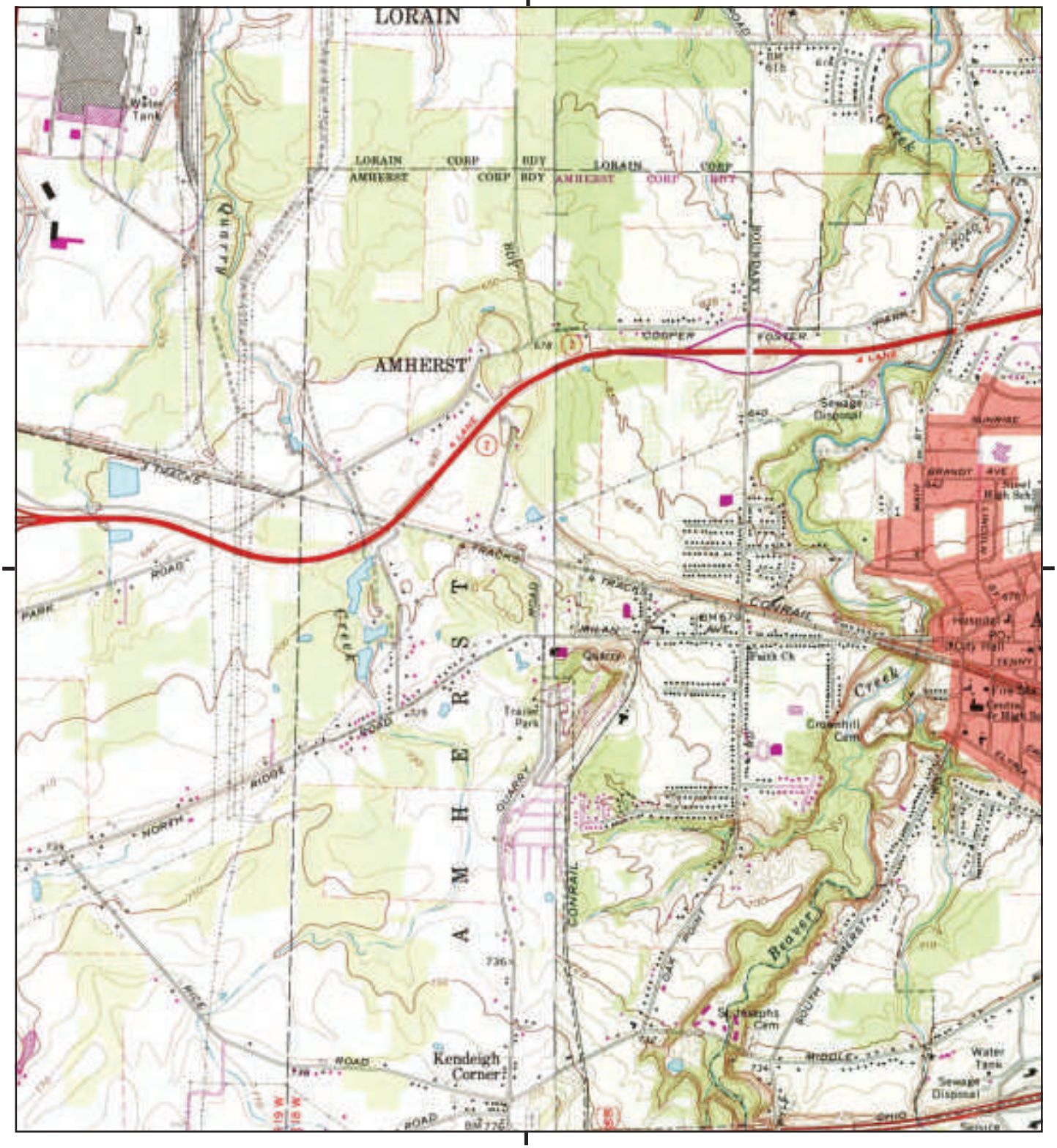
TP, Vermilion East, 2013, 7.5-minute
NE, Lorain, 2013, 7.5-minute

SITE NAME: Amherst #2
ADDRESS: 1161 Milan Avenue
Amherst, OH 44001
CLIENT: Power Engineers

N

Historical Topo Map

1979



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

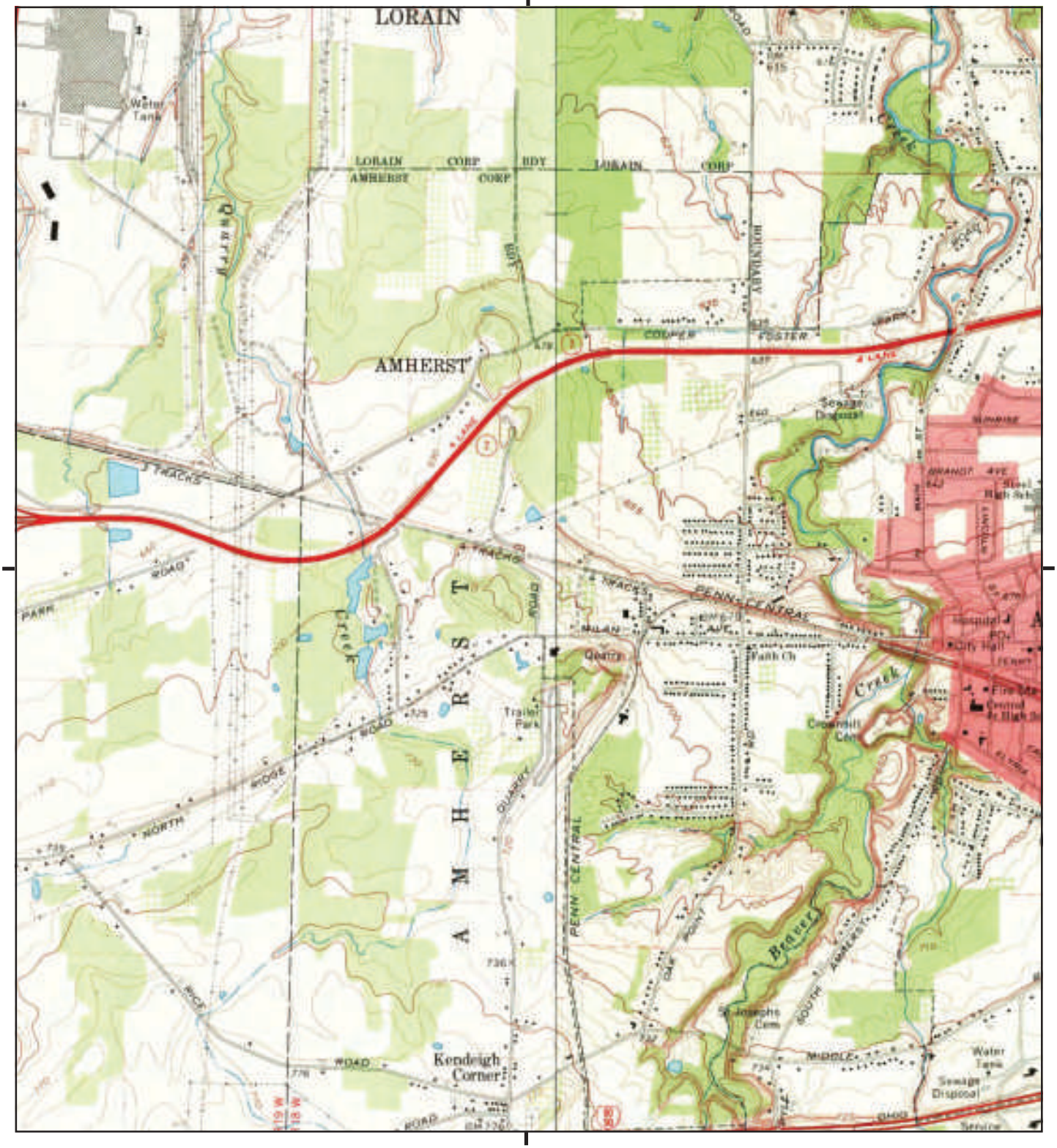
TP, Vermilion East, 1979, 7.5-minute
NE, Lorain, 1979, 7.5-minute

SITE NAME: Amherst #2
ADDRESS: 1161 Milan Avenue
Amherst, OH 44001
CLIENT: Power Engineers

N

Historical Topo Map

1969



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

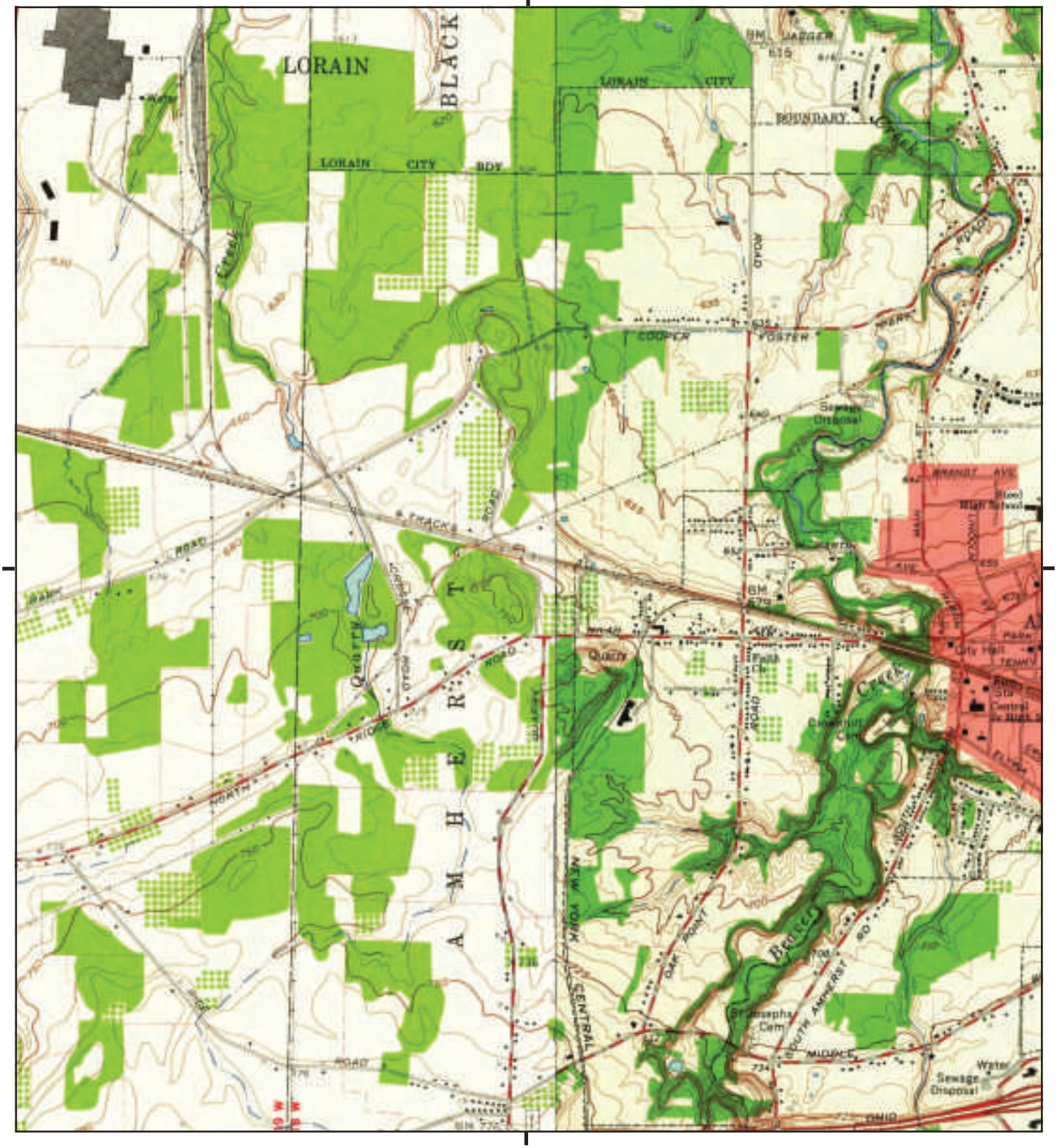
TP, Vermilion East, 1969, 7.5-minute
NE, Lorain, 1969, 7.5-minute

SITE NAME: Amherst #2
ADDRESS: 1161 Milan Avenue
Amherst, OH 44001
CLIENT: Power Engineers

N

Historical Topo Map

1959, 1960



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

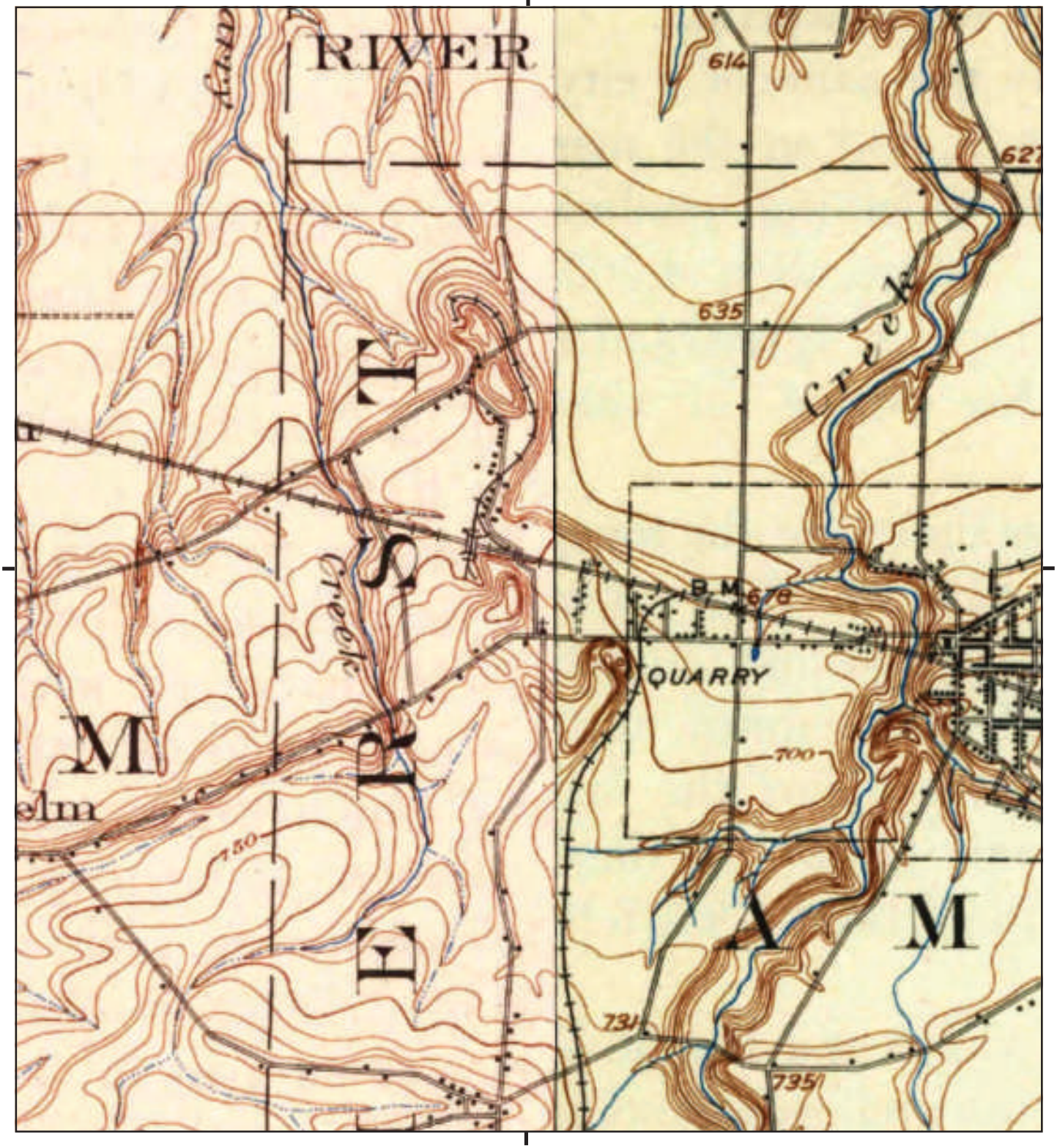
TP, Vermilion East, 1959, 7.5-minute
NE, Lorain, 1960, 7.5-minute

SITE NAME: Amherst #2
ADDRESS: 1161 Milan Avenue
Amherst, OH 44001
CLIENT: Power Engineers

N

Historical Topo Map

1903



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Vermilion, 1903, 15-minute
E, Oberlin, 1903, 15-minute

SITE NAME: Amherst #2
ADDRESS: 1161 Milan Avenue
Amherst, OH 44001
CLIENT: Power Engineers

N

Historical Topo Map

1901

This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

E, Oberlin, 1901, 15-minute

SITE NAME: Amherst #2
ADDRESS: 1161 Milan Avenue
Amherst, OH 44001
CLIENT: Power Engineers

N

APPENDIX E OWNER QUESTIONNAIRES

POWER ENGINEERS, INC.
11733 CHESTERDALE ROAD
CINCINNATI, OHIO 45246 USA

PHONE 513-326-1500
FAX 513-326-1550

Site Owner Questionnaire

POWER Engineers Inc. (POWER) is currently working on a Phase I Environmental Site Assessment (ESA) for a property which you have identified as the owner or occupant. The purpose of this questionnaire is to collect detailed information pertaining to the current and historic use of the property. Please fill out the questionnaire and provide adequate details to the best of your abilities.

Site Location: _____

Name: _____

Contact Information: _____

Date: _____

1. How long have you owned/occupied the property?
2. Are you aware of any environmental reports previously completed for the property? If so, can a copy of the report(s) be provided to POWER for review?
3. During the time which you have owned/occupied the property, what has it been used for?

4.	Are you aware of the previous uses of the property (age of development, previous occupants, etc.)?
5.	If possible, can you provide information related to the properties surrounding the site (current or previous businesses/activities).
6.	Please provide information related to the buildings located on the property (square footage, age of construction, etc.).
7.	Have you made any improvements to the building/property? If so, please provide a description of the improvements and the approximate year(s) that they occurred.

8. Please provide information related to the use/storage/handling of chemicals, hazardous materials, and/or petroleum products utilized at the property (name/type of materials, how are they stored, what are they used for, how are they disposed, etc.)
9. Are there any sumps, oil-water separators, grease traps, septic tanks, or wells on the property?
10. Are there any above ground storage tanks (ASTs) or underground storage tanks (USTs) located on the property? If so, please provide size, contents, and location of the tanks.
11. Were there any ASTs or USTs previously located on the property? If so, what were their size and contents, where were they located, and when were they removed?

12. Is there any PCB-containing equipment used at the property (such as electrical transformers and capacitors, fluorescent light ballasts, or hydraulic equipment such as lifts or cranes)?
13. Please provide information related to the utility providers and confirm that there are no water wells or septic systems at the property.
Electricity: _____ Natural Gas: _____ Water: _____ Sewer: _____
14. Are you aware of any incidents/spills/releases which may have occurred at the property that would present an environmental concern?
15. Please provide any additional information related to the site:

From: Steven Burgess
To: Nietz, Jennifer
Cc: Jamie Woelfl
Subject: [EXTERNAL] Fwd: Land Owners" Questionnaire - Bartish
Date: Wednesday, June 16, 2021 9:31:12 PM
Attachments: image001.png

Jennifer,

See below from Attorney Stahler. These are the answers to the Phase 1 ESA Questionnaire that he provided for the Bartish properties.

Thank you,

Steven Burgess II
Emerald Energy & Exploration Land Company
Lead Right of Way Agent
Cell: (606) 205-8755
9850 Von Allmen Court, Suite 201, Louisville, KY
Office: (502) 907-2487

From: Clinton Stahler <Stahler@GBSKlaw.com>
Sent: Wednesday, June 16, 2021 4:48:23 PM
To: Jamie Woelfl <jwoelfl@E3CO.Land>
Cc: Steven Burgess <sburgessII@E3CO.Land>; Aaron Kenter <Kenter@GBSKlaw.com>
Subject: RE: Land Owners' Questionnaire - Bartish

Please find herein answers on behalf of my clients, the Bartishes:

1. Since 2018
2. No
3. Residence
4. No
5. No
6. House: 3,584 s.f., 2021
7. Yes – built home in 2021
8. N/A
9. Yes
10. No
11. Unknown
12. Unknown
13. City of Amherst utilities; Columbia Gas
14. No
15. None

Clinton P. Stahler, Esq.
Partner, Goldman Braunstein Stahler Kenter LLP

A 500 S. Front St., Ste. 1200, Columbus, OH 43215
P 614-229-4501 **M** 614-330-8511 **F** 614-229-4568
E Stahler@GBSKlaw.com **W** www.GBSKlaw.com [gbsklaw.com]

Kenter LLP are not tax advisors. Contact your tax advisor about eminent domain tax consequences.

From: Jamie Woelfl <jwoelfl@E3CO.Land>
Sent: Thursday, June 10, 2021 10:54 AM
To: Clinton Stahler <Stahler@GBSKlaw.com>
Cc: Steven Burgess <sburgessII@E3CO.Land>
Subject: Re: Land Owners' Questionnaire

Mr. Stahler,

Good morning, I wanted to check in with you to see if you received any input/feedback from your clients' regarding the Phase 1 Environmental Site Assessment Site Owner Questionnaire form? For reference I have attached the site questionnaire.

Thank you,

Emerald Energy & Exploration Land Company

Jamie Woelfl

Real Estate/Right of Way Agent

Cell: (216) 392-2197

9850 Von Allmen Court, Suite 201, Louisville, KY

Office: (502) 907-2487

From: Jamie Woelfl
Sent: Tuesday, May 4, 2021 1:31 PM
To: Clinton Stahler <Stahler@GBSKlaw.com>
Cc: Steven Burgess <sburgessII@E3CO.Land>
Subject: Land Owners' Questionnaire

Mr. Stahler,

Good afternoon, POWER Engineers, Inc. has asked me to provide the attached Site Owner Questionnaire to you for your clients to fill out in support of POWER's upcoming Phase 1 Environmental Site Assessment (ESA). The purpose of the questionnaire is to acquire additional information about the Landowners' properties for the Site Assessment survey. Would you mind to please send this form to Mr. Bartish, Mr. & Mrs. Miller, and Mr. & Mrs. Silva to complete and return to me? If you or any of your clients have any questions, please let me know.

Thank you,

Emerald Energy & Exploration Land Company

Jamie Woelfl

Real Estate/Right of Way Agent

Cell: (216) 392-2197

9850 Von Allmen Court, Suite 201, Louisville, KY

Office: (502) 907-2487

From: Steven Burgess
To: Nietz, Jennifer
Cc: Jamie Woelfl
Subject: [EXTERNAL] Fwd: Land Owners" Questionnaire - Miller
Date: Wednesday, June 16, 2021 9:30:16 PM
Attachments: image001.png

Jennifer,

See below from Attorney Stahler. These are the answered to the Phase 1 ESA Questionnaire that he provided for the Miller's properties.

Thank you,

Steven Burgess II
Emerald Energy & Exploration Land Company
Lead Right of Way Agent
Cell: (606) 205-8755
9850 Von Allmen Court, Suite 201, Louisville, KY
Office: (502) 907-2487

From: Clinton Stahler <Stahler@GBSKlaw.com>
Sent: Wednesday, June 16, 2021 4:47 PM
To: Jamie Woelfl
Cc: Steven Burgess; Aaron Kenter
Subject: RE: Land Owners' Questionnaire - Miller

Jamie,

Please find herein answers on behalf of my clients, the Millers:

1. Parcel 05-00-098-000-148 – since the 1980s; Parcel 05-00-098-000-81 – since the 1990s
2. No
3. Residence
4. No
5. No
6. House: 2,000 s.f., 1992; barn: 384 s.f., 1993
7. Various renovations and improvements over the years.
8. Domestic only
9. Septic system
10. No
11. Unknown
12. Unknown
13. City of Amherst utilities; septic system; no water wells
14. No
15. None

Clinton P. Stahler, Esq.
Partner, Goldman Braunstein Stahler Kenter LLP

A 500 S. Front St., Ste. 1200, Columbus, OH 43215
P 614-229-4501 **M** 614-330-8511 **F** 614-229-4568_

E Stahler@GBSKlaw.com W www.GBSKlaw.com [gbsklaw.com]

From: Jamie Woelfl <jwoelfl@E3CO.Land>
Sent: Thursday, June 10, 2021 10:54 AM
To: Clinton Stahler <Stahler@GBSKlaw.com>
Cc: Steven Burgess <sburgessII@E3CO.Land>
Subject: Re: Land Owners' Questionnaire

Mr. Stahler,

Good morning, I wanted to check in with you to see if you received any input/feedback from your clients' regarding the Phase 1 Environmental Site Assessment Site Owner Questionnaire form? For reference I have attached the site questionnaire.

Thank you,

Emerald Energy & Exploration Land Company

Jamie Woelfl

Real Estate/Right of Way Agent

Cell: (216) 392-2197

9850 Von Allmen Court, Suite 201, Louisville, KY

Office: (502) 907-2487

From: Jamie Woelfl
Sent: Tuesday, May 4, 2021 1:31 PM
To: Clinton Stahler <Stahler@GBSKlaw.com>
Cc: Steven Burgess <sburgessII@E3CO.Land>
Subject: Land Owners' Questionnaire

Mr. Stahler,

Good afternoon, POWER Engineers, Inc. has asked me to provide the attached Site Owner Questionnaire to you for your clients to fill out in support of POWER's upcoming Phase 1 Environmental Site Assessment (ESA). The purpose of the questionnaire is to acquire additional information about the Landowners' properties for the Site Assessment survey. Would you mind to please send this form to Mr. Bartish, Mr. & Mrs. Miller, and Mr. & Mrs. Silva to complete and return to me? If you or any of your clients have any questions, please let me know.

Thank you,

Emerald Energy & Exploration Land Company

Jamie Woelfl

Real Estate/Right of Way Agent

Cell: (216) 392-2197

9850 Von Allmen Court, Suite 201, Louisville, KY

Office: (502) 907-2487

Emerald Energy & Exploration Land Company

Steven Burgess II
Lead Right of Way Agent
Cell: (606) 205-8755

9850 Von Allmen Court, Suite 201, Louisville, KY
Office: (502) 907-2487

From: Clinton Stahler <Stahler@GBSKlaw.com>
Sent: Saturday, June 19, 2021 3:30 PM
To: Jamie Woelfl <jwoelfl@E3CO.Land>
Cc: Steven Burgess <sburgessII@E3CO.Land>; Aaron Kenter <Kenter@GBSKlaw.com>
Subject: RE: Land Owners' Questionnaires - Miller and Bartish

Jamie,

Please find herein answers on behalf of my clients, the Silvas:

(1) 11/2018
(2) No
(3) Residence
(4) No
(5) No
(6) House: 3,500 s.f. with walkout basement; pole building: 5,000 s.f.; cabin: 800 s.f. All buildings less than 22 years old
(7) Complete interior remodel of house in 2019. New roofs on all buildings in 2019. New lawns and landscaping in front and back of house.
(8) None
(9) Two septic systems
(10) Water holding tank for septic system
(11) Unknown
(12) Unknown
(13) Water well in front of the barn
(14) Ohio Edison
(15) No natural gas
(16) Amherst Water
(17) Septic system
(18) Unknown
(19) Unknown

Clinton P. Stahler, Esq.
Partner, Goldman Braunstein Stahler Kenter LLP

APPENDIX F GOVERNMENT RECORDS REPORT

Amherst #2
1161 Milan Avenue
Amherst, OH 44001

Inquiry Number: 6474298.2s
April 30, 2021

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

1161 MILAN AVENUE
AMHERST, OH 44001

COORDINATES

Latitude (North):	41.4015090 - 41° 24' 5.43''
Longitude (West):	82.2513730 - 82° 15' 4.94''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	395395.0
UTM Y (Meters):	4583873.0
Elevation:	701 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5965978 VERMILION EAST, OH
Version Date:	2013
Northeast Map:	5966074 LORAIN, OH
Version Date:	2013

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20150711
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
1161 MILAN AVENUE
AMHERST, OH 44001

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	ATC #50948 JOHN JONE	1025 N QUARRY RD	AST	Higher	108, 0.020, West
2	MIDSTATE INTERNATION	1115 MILAN AVE	RCRA NonGen / NLR, FINDS, ECHO	Lower	535, 0.101, SE
3	AMHERST IGA FOODLINE	1190 MILAN AVE	LUST, UST, ARCHIVE UST	Higher	618, 0.117, SSE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-VSQG ---------- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System

US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROLS..... Institutional Controls Sites List

Federal ERNS list

ERNS..... Emergency Response Notification System

State- and tribal - equivalent CERCLIS

SHWS..... This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.
DERR..... Division of Environmental Response and Revitalization Database

State and tribal landfill and/or solid waste disposal site lists

SWF/LF..... Licensed Solid Waste Facilities

State and tribal leaking storage tank lists

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land
UNREG LTANKS..... Ohio Leaking UST File

State and tribal registered storage tank lists

FEMA UST..... Underground Storage Tank Listing
INDIAN UST..... Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

HIST INST CONTROLS..... Institutional Controls Database
HIST ENG CONTROLS..... Operation & Maintenance Agreements Database
ENG CONTROLS..... Sites with Engineering Controls
INST CONTROL..... Sites with Institutional Engineering Controls

State and tribal voluntary cleanup sites

VCP..... Voluntary Action Program Sites
INDIAN VCP..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS..... Ohio Brownfield Inventory

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

HIST LF..... Old Solid Waste Landfill
SWRCY..... Recycling Facility Listing
INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands

DEBRIS REGION 9 ---- Torres Martinez Reservation Illegal Dump Site Locations
ODI ---- Open Dump Inventory
IHS OPEN DUMPS ---- Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ---- Delisted National Clandestine Laboratory Register
CDL ---- Clandestine Drug Lab Locations
US CDL ---- National Clandestine Laboratory Register
PFAS ---- PFOA & PFOS Site Listing

Local Land Records

LIENS 2 ---- CERCLA Lien Information

Records of Emergency Release Reports

HMIRS ---- Hazardous Materials Information Reporting System
SPILLS ---- Emergency Response Database
SPILLS 90 ---- SPILLS 90 data from FirstSearch
SPILLS 80 ---- SPILLS 80 data from FirstSearch

Other Ascertainable Records

FUDS ---- Formerly Used Defense Sites
DOD ---- Department of Defense Sites
SCRD DRYCLEANERS ---- State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ---- Financial Assurance Information
EPA WATCH LIST ---- EPA WATCH LIST
2020 COR ACTION ---- 2020 Corrective Action Program List
TSCA ---- Toxic Substances Control Act
TRIS ---- Toxic Chemical Release Inventory System
SSTS ---- Section 7 Tracking Systems
ROD ---- Records Of Decision
RMP ---- Risk Management Plans
RAATS ---- RCRA Administrative Action Tracking System
PRP ---- Potentially Responsible Parties
PADS ---- PCB Activity Database System
ICIS ---- Integrated Compliance Information System
FTTS ---- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ---- Material Licensing Tracking System
COAL ASH DOE ---- Steam-Electric Plant Operation Data
COAL ASH EPA ---- Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ---- PCB Transformer Registration Database
RADINFO ---- Radiation Information Database
HIST FTTS ---- FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ---- Incident and Accident Data
CONSENT ---- Superfund (CERCLA) Consent Decrees
INDIAN RESERV ---- Indian Reservations
FUSRAP ---- Formerly Utilized Sites Remedial Action Program
UMTRA ---- Uranium Mill Tailings Sites
LEAD SMELTERS ---- Lead Smelter Sites
US AIRS ---- Aerometric Information Retrieval System Facility Subsystem
US MINES ---- Mines Master Index File

EXECUTIVE SUMMARY

ABANDONED MINES - Abandoned Mines
FINDS - Facility Index System/Facility Registry System
UXO - Unexploded Ordnance Sites
ECHO - Enforcement & Compliance History Information
DOCKET HWC - Hazardous Waste Compliance Docket Listing
FUELS PROGRAM - EPA Fuels Program Registered Listing
AIRS - Title V Permits Listing
ASBESTOS - Asbestos Notification Listing
COAL ASH - Coal Ash Disposal Site Listing
CRO - Cessation of Regulated Operations Facility Listing
DRYCLEANERS - Drycleaner Facility Listing
Financial Assurance - Financial Assurance Information Listing
HIST USD - Urban Setting Designations Database
LEAD - Lead Inspections Listing
NPDES - NPDES General Permit List
VAPOR - Vapor Intrusion
TOWNGAS - DERR Towngas Database
UIC - Underground Injection Wells Listing
USD - Urban Setting Designation Sites
MINES MRDS - Mineral Resources Data System

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP - EDR Proprietary Manufactured Gas Plants
EDR Hist Auto - EDR Exclusive Historical Auto Stations
EDR Hist Cleaner - EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF - Recovered Government Archive Solid Waste Facilities List
RGA LUST - Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Commerce Division of State Fire Marshal's List of Reported Petroleum Underground Storage Tank Release Incidents.

A review of the LUST list, as provided by EDR, and dated 11/09/2020 has revealed that there is 1 LUST site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
AMHERST IGA FOODLINE	***1190 MILAN AVE***	***SSE 0 - 1/8 (0.117 mi.)***	***3***	***12***
Facility Status: Active FR Status: CLO: Closure				
FR Status: Active FR Status: CLO: Closure				

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Commerce Division of State Fire Marshal's Facility File.

A review of the UST list, as provided by EDR, and dated 11/09/2020 has revealed that there is 1 UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
AMHERST IGA FOODLINE	***1190 MILAN AVE***	***SSE 0 - 1/8 (0.117 mi.)***	***3***	***12***
Facility Id: 47000841				
Tank Status: REM - Removed				
Tank Status: CIU - Currently In Use				

AST: A listing of aboveground storage tank site locations in the state.

A review of the AST list, as provided by EDR, and dated 11/03/2020 has revealed that there is 1 AST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ATC #50948 JOHN JONE	1025 N QUARRY RD	W 0 - 1/8 (0.020 mi.)	1	8
Permit Number: 62.47.0165				
Status: PERMIT CLOSED OUT				

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Registered Storage Tanks

ARCHIVE UST: Underground storage tank records that have been removed from the Underground Storage Tank database.

A review of the ARCHIVE UST list, as provided by EDR, and dated 11/09/2020 has revealed that there is 1 ARCHIVE UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
AMHERST IGA FOODLINE	***1190 MILAN AVE***	***SSE 0 - 1/8 (0.117 mi.)***	***3***	***12***
Facility Number: 47000841				
Tank Status: CIU				
Tank Status: REM				

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 12/14/2020 has revealed that there is 1 RCRA NonGen / NLR site within approximately 0.25 miles of the target property.

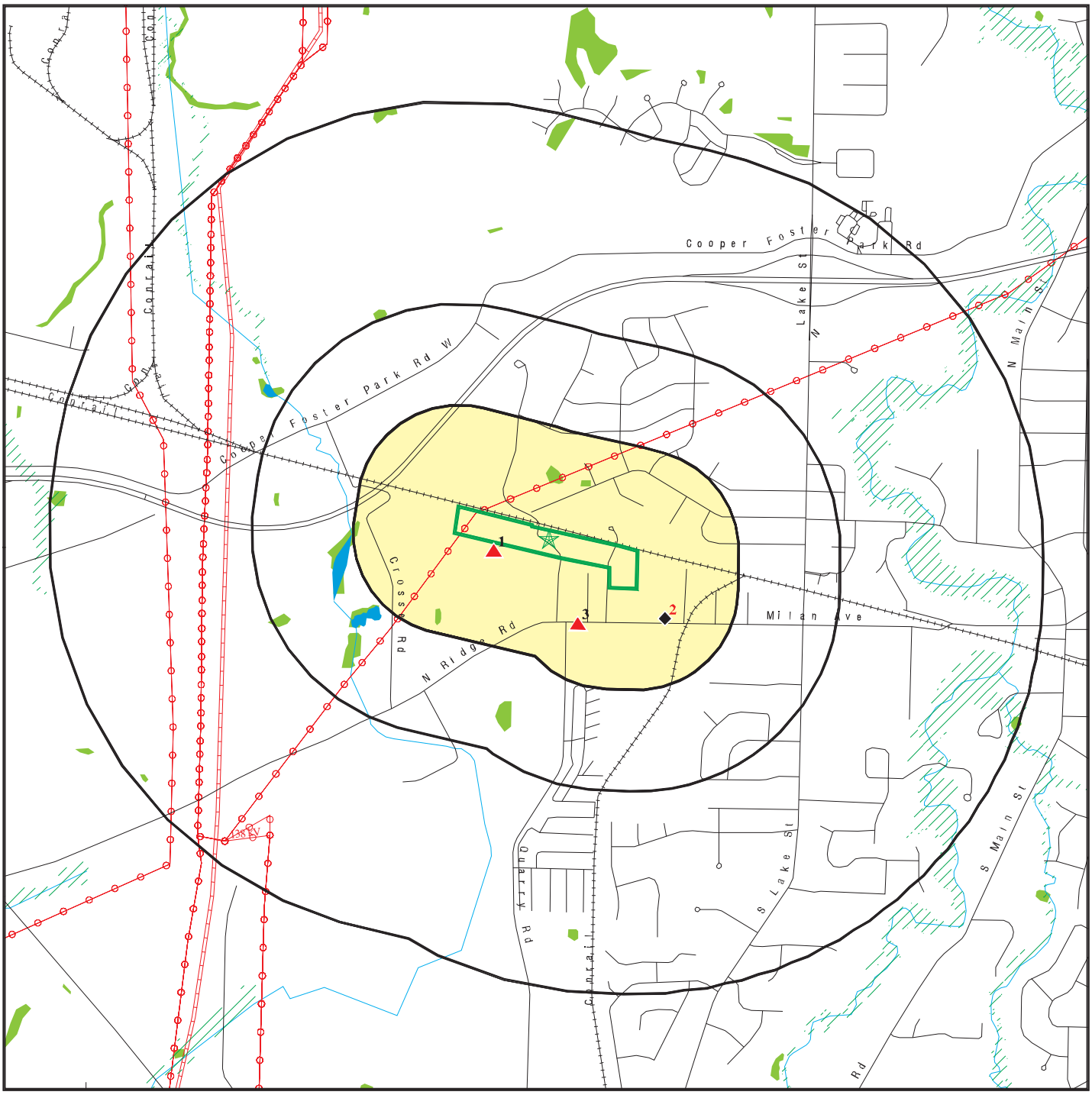
Lower Elevation	Address	Direction / Distance	Map ID	Page
MIDSTATE INTERNATION	***1115 MILAN AVE***	***SE 0 - 1/8 (0.101 mi.)***	***2***	***8***
EPA ID:: OHD981538457				

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 4 records.

Site Name	Database(s)
AMHERST QUARRY	SEMS-ARCHIVE
AMHERST MARATHON UNIT 3198	FINDS
PRICE BROS AMHERST SEWER PIPE	FINDS
AMHERST WWTP	SPILLS

OVERVIEW MAP - 6474298.2S



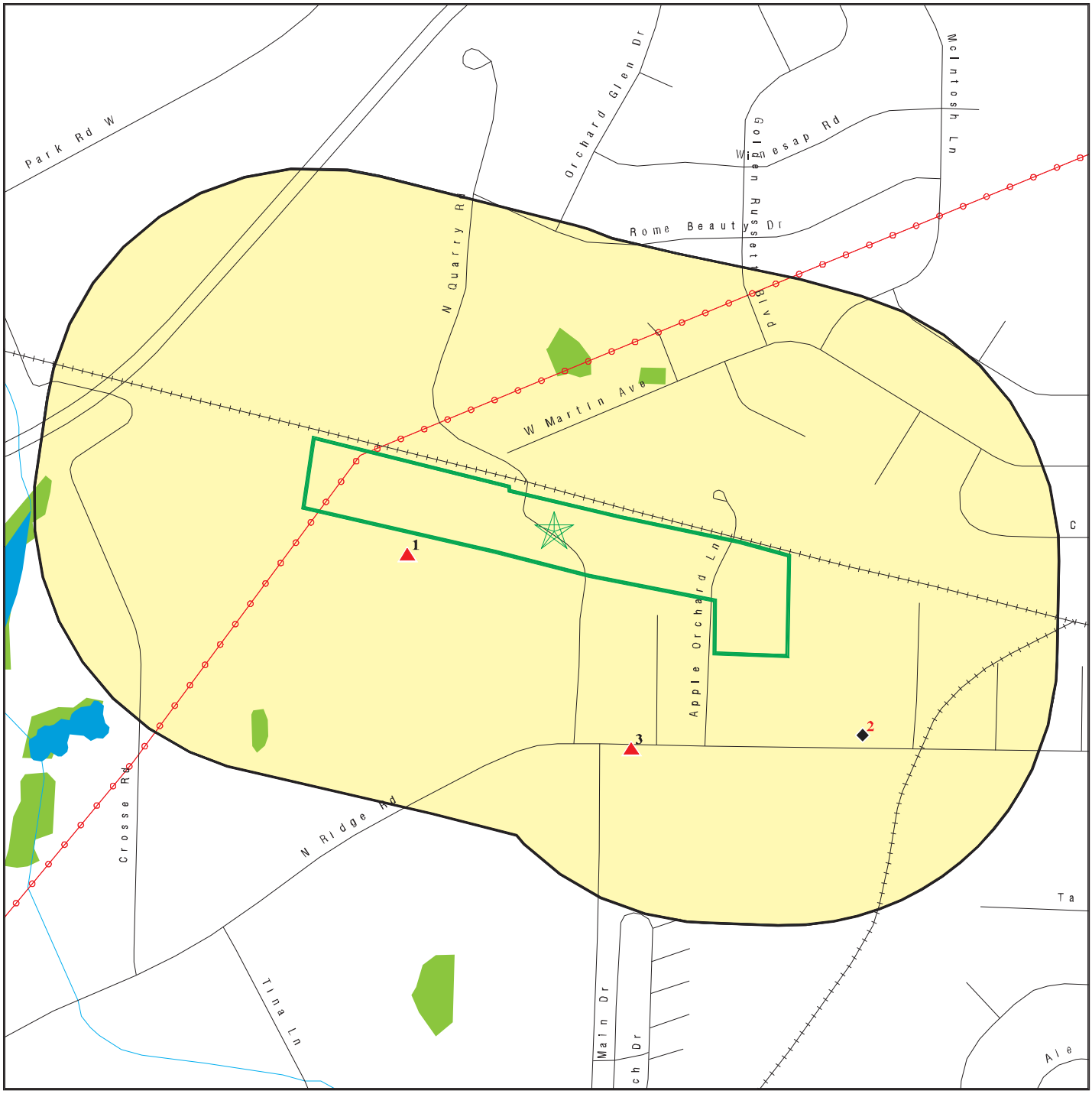
0 1/4 1/2 1 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Pipelines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Amherst #2	CLIENT:	Power Engineers
ADDRESS:	1161 Milan Avenue Amherst OH 44001	CONTACT:	Lindsey Branham
		INQUIRY #:	6474298.2s
LAT/LONG:	41.401509 / 82.251373	DATE:	April 30, 2021 2:23 pm

DETAIL MAP - 6474298.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Amherst #2	CLIENT: Power Engineers
ADDRESS: 1161 Milan Avenue Amherst OH 44001	CONTACT: Lindsey Branham INQUIRY #: 6474298.2s
LAT/LONG: 41.401509 / 82.251373	DATE: April 30, 2021 2:23 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	N/A		N/A	N/A	N/A	N/A	N/A	N/A
DERR	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		1	0	0	NR	NR	1
INDIAN LUST	0.500		0	0	0	NR	NR	0
UNREG LTANKS	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		1	0	NR	NR	NR	1
AST	0.250		1	0	NR	NR	NR	1
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
HIST INST CONTROLS	0.500		0	0	0	NR	NR	0
HIST ENG CONTROLS	0.500		0	0	0	NR	NR	0
ENG CONTROLS	0.500		0	0	0	NR	NR	0
INST CONTROL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
HIST LF	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
PFAS	0.500		0	0	0	NR	NR	0
Local Lists of Registered Storage Tanks								
ARCHIVE UST	0.250		1	0	NR	NR	NR	1
Local Land Records								
LIENS 2	0.001		0	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SPILLS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
SPILLS 80	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		1	0	NR	NR	NR	1
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
AIRS	0.001		0	NR	NR	NR	NR	0
ASBESTOS	0.001		0	NR	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
CRO	0.001		0	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
HIST USD	0.500		0	0	0	NR	NR	0
LEAD	0.001		0	NR	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
VAPOR	0.500		0	0	0	NR	NR	0
TOWNGAS	1.000		0	0	0	0	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
USD	0.500		0	0	0	NR	NR	0
MINES MRDS	0.001		0	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	5	0	0	0	0	5

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

1
West
< 1/8
0.020 mi.
108 ft.

ATC #50948 JOHN JONES PROPERTY
1025 N QUARRY RD
AMHERST, OH 44001

AST **A100391049**
N/A

Relative:
Higher

Actual:
715 ft.

AST:

Name:	ATC #50948 JOHN JONES PROPERTY
Address:	1025 N QUARRY RD
City,State,Zip:	AMHERST, OH 44001
Facility Attention:	Not reported
Permit Number:	62.47.0165
Owner Name:	AMERICAN TOWER CORP
Owner Attention:	Not reported
Owner Address:	7425 ROYALTON RD
Owner City:	NORTH ROYALTON
Owner State:	OH
Owner Zip:	44133-4743
Latitude:	0
Longitude:	0
Tank Size:	Not reported
Tank Contents:	Not reported
Status:	PERMIT CLOSED OUT

2
SE
< 1/8
0.101 mi.
535 ft.

MIDSTATE INTERNATIONAL MX INC
1115 MILAN AVE
AMHERST, OH 44001

RCRA NonGen / NLR **1000388099**
FINDS **OHD981538457**
ECHO

Relative:
Lower

Actual:
694 ft.

RCRA NonGen / NLR:

Date Form Received by Agency:	2019-02-12 00:00:00.0
Handler Name:	MIDSTATE INTERNATIONAL MX INC
Handler Address:	1115 MILAN AVE
Handler City,State,Zip:	AMHERST, OH 44001
EPA ID:	OHD981538457
Contact Name:	Not reported
Contact Address:	Not reported
Contact City,State,Zip:	Not reported
Contact Telephone:	Not reported
Contact Fax:	Not reported
Contact Email:	Not reported
Contact Title:	Not reported
EPA Region:	05
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Not reported
State District Owner:	OH
State District:	NE
Mailing Address:	Not reported
Mailing City,State,Zip:	Not reported
Owner Name:	Not reported
Owner Type:	Not reported
Operator Name:	Not reported
Operator Type:	Not reported
Short-Term Generator Activity:	No
Importer Activity:	No

MIDSTATE INTERNATIONAL MX INC (Continued) **1000388099**

Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site Fed-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site Converter Treatment storage and Disposal Facility:	Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	NN
Sub-Part K Indicator:	Not reported
Commercial TSD Indicator:	No
Treatment Storage and Disposal Type:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
Permit Renewals Workload Universe:	Not reported
Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	2019-02-12 11:32:38.0
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	Not reported

Hazardous Waste Summary:
Waste Code: F003

MIDSTATE INTERNATIONAL MX INC (Continued) **1000388099**

Waste Description: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NONHALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS, AND A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name:	PENTON IMPORTS CO
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	ADDRESS NOT REPORTED
Owner/Operator City,State,Zip:	CITY NOT REPORTED, AK 99998
Owner/Operator Telephone:	312-555-1212
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name:	NAME NOT REPORTED
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	ADDRESS NOT REPORTED
Owner/Operator City,State,Zip:	CITY NOT REPORTED, AK 99998
Owner/Operator Telephone:	312-555-1212
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	2019-02-12 00:00:00.0
Handler Name:	MIDSTATE INTERNATIONAL MX INC
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	OH
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	No
Electronic Manifest Broker:	No

Receive Date:	1986-08-27 00:00:00.0
Handler Name:	MIDSTATE INTERNATIONAL MX INC
Federal Waste Generator Description:	Small Quantity Generator
State District Owner:	OH
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No

MIDSTATE INTERNATIONAL MX INC (Continued) **1000388099**

Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	No
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

List of NAICS Codes and Descriptions:
NAICS Codes: No NAICS Codes Found

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

FINDS:
Registry ID: 110009607853

Click Here:

Environmental Interest/Information System:
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.
The OH-CORE (Ohio - Core) database contains information commonly shared among the Ohio EPA environmental programs. The information is facility-based, general in nature, and used to support specific programmatic systems while simultaneously maintaining an inventory of common facility-related data. Specific programmatic details are maintained in programmatic databases.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1000388099
Registry ID:	110009607853
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110009607853
Name:	MID-STATES INTERNATIONAL MOTORCROSS INC
Address:	1115 MILAN AVE
City,State,Zip:	AMHERST, OH 44001

3
SSE
< 1/8
0.117 mi.
618 ft.

AMHERST IGA FOODLINER #0938-6129
1190 MILAN AVE
AMHERST, OH 44001

LUST **U003765876**
UST **N/A**
ARCHIVE UST

Relative:
Higher

Actual:
716 ft.

LUST:

Name:	AMHERST IGA FOODLINER #0938-6129
Address:	1190 MILAN AVE
City,State,Zip:	AMHERST, OH 44001
Release Number:	47000841-N00001
Release Date:	02/12/2016
Facility Status:	**Active**
LTF Status:	6 Closure of regulated UST
FR Status:	**CLO: Closure**
Priority:	2
Review Date:	02/13/2020
Priority Decode:	SUS/CON from non-regulated UST
Class1 Decode:	The result of the RP Search was inconclusive
Latitude:	41.39821
Longitude:	-82.2499
Class:	Result of Responsible Party search was inconclusive

UST:

Name:	AMHERST IGA FOODLINER #0938-6129
Address:	1190 MILAN AVE
City,State,Zip:	AMHERST, OH 44001
Facility Id:	47000841
Facility Type:	Gas Station
Latitude:	41.398209999999999
Longitude:	-82.249899999999997
Owner Name:	SUNOCO RETAIL LLC
Owner Address:	1815 GALLAGHER RD
Owner City/State/Zip:	19462
Tank Number:	T00001
Status:	REM - Removed
UST Capacity:	10000
Tank Content:	Gasoline
Installation Date:	Not reported
Construction:	Not reported
Date Last Used:	09/28/2000
Date TCL Closed:	Not reported
Date Removed:	09/28/2000
CAS Number:	8006-61-9
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	Not reported
Construction Comments:	Not reported
Corrosion Protections:	Not reported
Corrosion Protection Comments:	Not reported
Primary Release Detection:	AMO - Alternative Method (Other, explain)
Secondary Release Detection:	Not reported
Release Detection Comments:	RDTank: / RDLine:
Piping Configuration:	Not reported
Piping Configuration Comments:	Not reported
Piping Styles:	NA - Not Applicable

AMHERST IGA FOODLINER #0938-6129 (Continued) **U003765876**

Piping Constructions:	OTH - Other (explain)
Piping Construction Comments:	Not reported
Piping Corrosion Protections:	OTH - Other (explain)
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	OTH - Other(explain)
Piping Release Detection Comments:	Not reported
Spill Prevention Manholes:	NP - None Present
Spill Prevention Manhole Comments:	No
OverFill Prevention:	Not reported
OverFill Prevention Comment:	OverFill Spill: No
Comments:	Not reported

Name:	AMHERST IGA FOODLINER #0938-6129
Address:	1190 MILAN AVE
City,State,Zip:	AMHERST, OH 44001

Tank Number:	T00002
Status:	REM - Removed
UST Capacity:	6000
Tank Content:	Gasoline
Installation Date:	Not reported
Construction:	Not reported
Date Last Used:	09/28/2000
Date TCL Closed:	Not reported
Date Removed:	09/28/2000
CAS Number:	8006-61-9
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	Not reported
Construction Comments:	Not reported
Corrosion Protections:	Not reported
Corrosion Protection Comments:	Not reported
Primary Release Detection:	AMO - Alternative Method (Other, explain)
Secondary Release Detection:	Not reported
Release Detection Comments:	RDTank: / RDLine:
Piping Configuration:	Not reported
Piping Configuration Comments:	Not reported
Piping Styles:	NA - Not Applicable
Piping Constructions:	OTH - Other (explain)
Piping Construction Comments:	Not reported
Piping Corrosion Protections:	OTH - Other (explain)
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	OTH - Other(explain)
Piping Release Detection Comments:	Not reported
Spill Prevention Manholes:	NP - None Present
Spill Prevention Manhole Comments:	No
OverFill Prevention:	Not reported
OverFill Prevention Comment:	OverFill Spill: No
Comments:	Not reported

Name:	AMHERST IGA FOODLINER #0938-6129
Address:	1190 MILAN AVE
City,State,Zip:	AMHERST, OH 44001

Tank Number:	T00003

AMHERST IGA FOODLINER #0938-6129 (Continued) **U003765876**

Status:	REM - Removed
UST Capacity:	1000
Tank Content:	Gasoline
Installation Date:	Not reported
Construction:	Not reported
Date Last Used:	09/28/2000
Date TCL Closed:	Not reported
Date Removed:	09/28/2000
CAS Number:	8006-61-9
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	Not reported
Construction Comments:	Not reported
Corrosion Protections:	Not reported
Corrosion Protection Comments:	Not reported
Primary Release Detection:	AMO - Alternative Method (Other, explain)
Secondary Release Detection:	Not reported
Release Detection Comments:	RDTank: / RDLine:
Piping Configuration:	Not reported
Piping Configuration Comments:	Not reported
Piping Styles:	NA - Not Applicable
Piping Constructions:	OTH - Other (explain)
Piping Construction Comments:	Not reported
Piping Corrosion Protections:	OTH - Other (explain)
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	OTH - Other(explain)
Piping Release Detection Comments:	Not reported
Spill Prevention Manholes:	NP - None Present
Spill Prevention Manhole Comments:	No
OverFill Prevention:	Not reported
OverFill Prevention Comment:	OverFill Spill: No
Comments:	Not reported

Name:	AMHERST IGA FOODLINER #0938-6129
Address:	1190 MILAN AVE
City,State,Zip:	AMHERST, OH 44001

Tank Number:	T00004
Status:	CIU - Currently In Use
UST Capacity:	12000
Tank Content:	Gasoline
Installation Date:	05/01/2001
Construction:	FRP-Fiberglass Reinforced Plastic
Date Last Used:	Not reported
Date TCL Closed:	Not reported
Date Removed:	Not reported
CAS Number:	8006-61-9
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	SC- Secondarily Contained
Construction Comments:	Double Walled Fiberglass
Corrosion Protections:	NR - None Required by Rule
Corrosion Protection Comments:	Not reported

AMHERST IGA FOODLINER #0938-6129 (Continued) **U003765876**

Primary Release Detection:	ATG - Automatic Tank Gauging
Secondary Release Detection:	Not reported
Release Detection Comments:	RDTank: Automatic Tank Gauging / RDLine:
Piping Configuration:	SC - Secondarily Contained
Piping Configuration Comments:	Not reported
Piping Styles:	P - Pressure
Piping Constructions:	OTH - Other (explain)
Piping Construction Comments:	Double Walled
Piping Corrosion Protections:	NR - None required by rule
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	MLLD - Mechanical Line Leak Detector
Piping Release Detection Comments:	Mechanical Line Leak Detector
Spill Prevention Manholes:	SB - Spill Containment Manhole (bucket)
Spill Prevention Manhole Comments:	Yes
OverFill Prevention:	FILL - Fill Pipe (drop tube flapper)
OverFill Prevention Comment:	Not reported
Comments:	Not reported

Name:	AMHERST IGA FOODLINER #0938-6129
Address:	1190 MILAN AVE
City,State,Zip:	AMHERST, OH 44001

Tank Number:	T00005
Status:	CIU - Currently In Use
UST Capacity:	4000
Tank Content:	Gasoline
Installation Date:	05/01/2001
Construction:	FRP-Fiberglass Reinforced Plastic
Date Last Used:	Not reported
Date TCL Closed:	Not reported
Date Removed:	Not reported
CAS Number:	8006-61-9
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	SC- Secondarily Contained
Construction Comments:	Double Walled Fiberglass
Corrosion Protections:	NR - None Required by Rule
Corrosion Protection Comments:	Not reported
Primary Release Detection:	ATG - Automatic Tank Gauging
Secondary Release Detection:	Not reported
Release Detection Comments:	RDTank: Automatic Tank Gauging / RDLine:
Piping Configuration:	SC - Secondarily Contained
Piping Configuration Comments:	Not reported
Piping Styles:	P - Pressure
Piping Constructions:	OTH - Other (explain)
Piping Construction Comments:	Double Walled
Piping Corrosion Protections:	NR - None required by rule
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	MLLD - Mechanical Line Leak Detector
Piping Release Detection Comments:	Mechanical Line Leak Detector
Spill Prevention Manholes:	SB - Spill Containment Manhole (bucket)
Spill Prevention Manhole Comments:	Yes
OverFill Prevention:	FILL - Fill Pipe (drop tube flapper)
OverFill Prevention Comment:	Not reported
Comments:	Not reported

AMHERST IGA FOODLINER #0938-6129 (Continued) **U003765876**

Name:	AMHERST IGA FOODLINER #0938-6129
Address:	1190 MILAN AVE
City,State,Zip:	AMHERST, OH 44001
Tank Number:	T00006
Status:	CIU - Currently In Use
UST Capacity:	2500
Tank Content:	Kerosene
Installation Date:	05/01/2001
Construction:	FRP-Fiberglass Reinforced Plastic
Date Last Used:	Not reported
Date TCL Closed:	Not reported
Date Removed:	Not reported
CAS Number:	8008-20-6
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	SC- Secondarily Contained
Construction Comments:	Double Walled Fiberglass
Corrosion Protections:	NR - None Required by Rule
Corrosion Protection Comments:	Not reported
Primary Release Detection:	ATG - Automatic Tank Gauging
Secondary Release Detection:	Not reported
Release Detection Comments:	RDTank: Automatic Tank Gauging / RDLine:
Piping Configuration:	SC - Secondarily Contained
Piping Configuration Comments:	Not reported
Piping Styles:	P - Pressure
Piping Constructions:	OTH - Other (explain)
Piping Construction Comments:	Double Walled
Piping Corrosion Protections:	NR - None required by rule
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	MLLD - Mechanical Line Leak Detector
Piping Release Detection Comments:	Mechanical Line Leak Detector
Spill Prevention Manholes:	SB - Spill Containment Manhole (bucket)
Spill Prevention Manhole Comments:	Yes
OverFill Prevention:	FILL - Fill Pipe (drop tube flapper)
OverFill Prevention Comment:	Not reported
Comments:	Not reported

ARCHIVE UST:

Name:	AMHERST IGA FOODLINER
Address:	1190 MILAN AVE
City,State,Zip:	AMHERST, OH 44001
Facility Number:	47000841
Owner Name:	SCHMITT SALES, INC.
Owner Address:	2101 ST RITAS LN
Owner City,St,Zip:	BUFFALO, NY 14221
Owner Telephone:	(716)639-1500
Owner ID:	W003753
Facility Type:	Gas Station
Contact Name:	Terry Mahon
Contact Telephone:	(716)639-1500
Tank Number:	3
Depth at Location:	AMHERST FIRE DEPARTMENT
Authorized:	No
Eligible Award:	Not reported

AMHERST IGA FOODLINER #0938-6129 (Continued) **U003765876**

Action: No

Permit:
Facility Id: 47000841
Permit Id: P00001
Permit Status: Expired
Issued Date: 3/3/2000
LFD Permit Id: Not reported

Facility Id: 47000841
Permit Id: P00002
Permit Status: Closed
Issued Date: 4/27/2001
LFD Permit Id: Not reported

Inspection:
Facility Id: 47000841
Permit Number: P00001
Code: 203
Inspection Type: Preliminary

Facility Id: 47000841
Permit Number: P00002
Code: 203
Inspection Type: Preliminary

Facility Id: 47000841
Permit Number: P00002
Code: 203
Inspection Type: Preliminary

Tank ID: T00001
Tank Type: Not reported
Tank Status: Removed
Install Date: Not reported
Content: Not reported
Capacity: Not reported
Corrosion Protection Tank: Not reported
CAS #: Not reported
Regulated: Yes
Overfill Device Installed: No
Spill Device Installed: No
Release Detection On Tank: Not reported
Date Removed: 9/28/2000
Date Last Use: 9/28/2000
Date Abandoned/Closed: Not reported
AST/UST: UST
Corrosion Protection Piping: Not reported
Piping Material: Not reported
Piping Type: Not reported
Release Detection On Piping: Not reported

Tank ID: T00002
Tank Type: Not reported
Tank Status: Removed

AMHERST IGA FOODLINER #0938-6129 (Continued) **U003765876**

Install Date:	Not reported
Content:	Not reported
Capacity:	Not reported
Corrosion Protection Tank:	Not reported
CAS #:	Not reported
Regulated:	Yes
Overfill Device Installed:	No
Spill Device Installed:	No
Release Detection On Tank:	Not reported
Date Removed:	9/28/2000
Date Last Use:	9/28/2000
Date Abandoned/Closed:	Not reported
AST/UST:	UST
Corrosion Protection Piping:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Release Detection On Piping:	Not reported

Tank ID:	T00003
Tank Type:	Not reported
Tank Status:	**Removed**
Install Date:	Not reported
Content:	Not reported
Capacity:	Not reported
Corrosion Protection Tank:	Not reported
CAS #:	Not reported
Regulated:	Yes
Overfill Device Installed:	No
Spill Device Installed:	No
Release Detection On Tank:	Not reported
Date Removed:	9/28/2000
Date Last Use:	9/28/2000
Date Abandoned/Closed:	Not reported
AST/UST:	UST
Corrosion Protection Piping:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Release Detection On Piping:	Not reported

Tank ID:	T00004
Tank Type:	Not reported
Tank Status:	**Currently In Use**
Install Date:	Not reported
Content:	Not reported
Capacity:	Not reported
Corrosion Protection Tank:	Not reported
CAS #:	Not reported
Regulated:	Yes
Overfill Device Installed:	Yes
Spill Device Installed:	Yes
Release Detection On Tank:	Not reported
Date Removed:	Not reported
Date Last Use:	Not reported
Date Abandoned/Closed:	Not reported
AST/UST:	UST

AMHERST IGA FOODLINER #0938-6129 (Continued) **U003765876**

Corrosion Protection Piping:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Release Detection On Piping:	Mechanical Line Leak Detector

Tank ID:	T00005
Tank Type:	Not reported
Tank Status:	**Currently In Use**
Install Date:	Not reported
Content:	Not reported
Capacity:	Not reported
Corrosion Protection Tank:	Not reported
CAS #:	Not reported
Regulated:	Yes
Overfill Device Installed:	Yes
Spill Device Installed:	Yes
Release Detection On Tank:	Not reported
Date Removed:	Not reported
Date Last Use:	Not reported
Date Abandoned/Closed:	Not reported
AST/UST:	UST
Corrosion Protection Piping:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Release Detection On Piping:	Mechanical Line Leak Detector

Tank ID:	T00006
Tank Type:	Not reported
Tank Status:	**Currently In Use**
Install Date:	Not reported
Content:	Not reported
Capacity:	Not reported
Corrosion Protection Tank:	Not reported
CAS #:	Not reported
Regulated:	Yes
Overfill Device Installed:	Yes
Spill Device Installed:	Yes
Release Detection On Tank:	Not reported
Date Removed:	Not reported
Date Last Use:	Not reported
Date Abandoned/Closed:	Not reported
AST/UST:	UST
Corrosion Protection Piping:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Release Detection On Piping:	Mechanical Line Leak Detector

Count: 4 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
AMHERST	S112819526	AMHERST WWTP	CORNER OF MILAN & SPRINGER		SPILLS
AMHERST	1016133511	AMHERST MARATHON UNIT 3198	ELYRIA-MILAN AND LEAVITT	44001	FINDS
AMHERST	1005873469	PRICE BROS AMHERST SEWER PIPE	WEST MILAN AVE	44001	FINDS
AMHERST	1003872144	AMHERST QUARRY	QUARRY ROAD	44001	SEMS-ARCHIVE

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 04/01/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 04/01/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 04/01/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 03/30/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/18/2021
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/01/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/18/2021
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/01/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 02/09/2021
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 39

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/08/2021
Next Scheduled EDR Contact: 05/24/2021
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/18/2020
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/23/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/18/2020
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/23/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/15/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 7

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: Ohio EPA
Telephone: 614-644-2924
Last EDR Contact: 02/01/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: N/A

DERR: Division of Emergency & Remedial Response's Database

The DERR listings contains sites from all of Ohio that are in the Division of Environmental Response and Revitalization (DERR) database, which is an index of sites for which our district offices maintain files. The database is NOT a record of contaminated sites or sites suspected of contamination. Not all sites in the database are contaminated, and a site's absence from the database does not imply that it is uncontaminated.

Date of Government Version: 10/20/2020
Date Data Arrived at EDR: 11/04/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 82

Source: Ohio EPA
Telephone: 614-644-3538
Last EDR Contact: 02/03/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Semi-Annually

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Licensed Solid Waste Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 01/06/2021
Date Data Arrived at EDR: 01/07/2021
Date Made Active in Reports: 03/23/2021
Number of Days to Update: 75

Source: Ohio Environmental Protection Agency
Telephone: 614-644-2621
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank File

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 11/09/2020
Date Data Arrived at EDR: 11/11/2020
Date Made Active in Reports: 01/28/2021
Number of Days to Update: 78

Source: Department of Commerce
Telephone: 614-752-8200
Last EDR Contact: 04/08/2021
Next Scheduled EDR Contact: 05/24/2021
Data Release Frequency: Quarterly

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/07/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/12/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/09/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 12/22/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/02/2020
Date Data Arrived at EDR: 12/18/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 84

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

UNREG LTANKS: Ohio Leaking UST File
A suspected or confirmed release of petroleum from a non-regulated UST.

Date of Government Version: 08/25/1999
Date Data Arrived at EDR: 08/19/2003
Date Made Active in Reports: 08/26/2003
Number of Days to Update: 7

Source: Department of Commerce
Telephone: 614-752-7938
Last EDR Contact: 08/01/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/29/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 33

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

UST: Underground Storage Tank Tank File
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 11/09/2020
Date Data Arrived at EDR: 11/11/2020
Date Made Active in Reports: 01/28/2021
Number of Days to Update: 78

Source: Department of Commerce
Telephone: 614-752-8200
Last EDR Contact: 02/10/2021
Next Scheduled EDR Contact: 05/24/2021
Data Release Frequency: Quarterly

AST: Above Ground Storage Tanks
A listing of aboveground storage tank site locations in the state.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/04/2020
Date Made Active in Reports: 11/16/2020
Number of Days to Update: 12

Source: Department of Commerce
Telephone: 614-752-7037
Last EDR Contact: 04/22/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Quarterly

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/07/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 12/22/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/02/2020
Date Data Arrived at EDR: 12/18/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 84

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 11/12/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/09/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

HIST ENG CONTROLS: Operation & Maintenance Agreements Database

Volunteers that complete a voluntary action that relies on the ongoing operation and maintenance (O&M) of an engineered control to make the site protective (e.g" cap systems and ground water treatment systems) must enter into a legally binding agreement with the Ohio EPA before the director issues a covenant not to sue. This O&M Agreement must describe how the remedy is constructed and how itwill be monitored, maintained and repaired. It also lays out inspection opportunities for the agency. Companies must document that they have the financial capability to operate any remedy relied on, before the agency will agree to enter into the O&M Agreement. The statute requires that the agency be notified of any change in ownership. This database is no longer updated or maintained by the state agency.

Date of Government Version: 05/10/2005
Date Data Arrived at EDR: 04/04/2006
Date Made Active in Reports: 05/04/2006
Number of Days to Update: 30

Source: Ohio EPA
Telephone: 614-644-2306
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

HIST INST CONTROLS: Institutional Controls Database

"Institutional control" is a restriction that is recorded in the same manner as a deed which limits access to or use of the property such that exposure to hazardous substances or petroleum are effectively and reliably eliminated or mitigated. Examples of institutional controls include land and water use restrictions. This database is no longer updated or maintained by the state agency.

Date of Government Version: 05/10/2005
Date Data Arrived at EDR: 04/06/2006
Date Made Active in Reports: 05/04/2006
Number of Days to Update: 28

Source: Ohio EPA
Telephone: 614-644-2306
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

ENG CONTROLS: Sites with Engineering Controls

A database that tracks properties with engineering controls.

Date of Government Version: 10/20/2020
Date Data Arrived at EDR: 11/04/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 82

Source: Ohio EPA
Telephone: 614-644-2306
Last EDR Contact: 02/03/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Semi-Annually

INST CONTROL: Sites with Institutional Engineering Controls

A database that tracks properties with institutional controls.

Date of Government Version: 10/20/2020
Date Data Arrived at EDR: 11/04/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 82

Source: Ohio Environmental Protection Agency
Telephone: 614-644-2306
Last EDR Contact: 02/03/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Semi-Annually

State and tribal voluntary cleanup sites

VCP: Voluntary Action Program Sites
Site involved in the Voluntary Action Program.

Date of Government Version: 10/20/2020
Date Data Arrived at EDR: 11/04/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 82
Source: Ohio EPA, Voluntary Action Program
Telephone: 614-728-1298
Last EDR Contact: 02/03/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Semi-Annually

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142
Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 03/22/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Ohio Brownfield Inventory
A statewide brownfields inventory. A brownfield is an abandoned, idled or under-used industrial or commercial property where expansion or redevelopment is complicated by known or potential releases of hazardous substances and/or petroleum.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/08/2020
Date Made Active in Reports: 02/23/2021
Number of Days to Update: 77
Source: Ohio EPA
Telephone: 614-644-3748
Last EDR Contact: 03/10/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/11/2020
Date Data Arrived at EDR: 12/11/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 81
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/16/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY: Recycling Facility Listing
A listing of recycling facility locations.

Date of Government Version: 01/04/2021
Date Data Arrived at EDR: 01/21/2021
Date Made Active in Reports: 04/13/2021
Number of Days to Update: 82

Source: Ohio EPA
Telephone: 614-728-5357
Last EDR Contact: 04/19/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Quarterly

HIST LF: Old Solid Waste Landfill
A list of about 1200 old abandoned dumps or landfills. This database was developed from Ohio EPA staff notebooks and other information dating from the mid-1970s

Date of Government Version: 12/02/2020
Date Data Arrived at EDR: 12/08/2020
Date Made Active in Reports: 02/23/2021
Number of Days to Update: 77

Source: Ohio EPA
Telephone: 614-644-3749
Last EDR Contact: 03/10/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 04/22/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Varies

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 04/29/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 83

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/22/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Lab Locations

A list of clandestine drug lab sites with environmental impact. This list is extracted from the SPILLS database based on the "product" type.

Date of Government Version: 11/02/2020
Date Data Arrived at EDR: 11/04/2020
Date Made Active in Reports: 01/27/2021
Number of Days to Update: 84

Source: Ohio EPA
Telephone: 614-644-2080
Last EDR Contact: 02/02/2021
Next Scheduled EDR Contact: 05/16/2021
Data Release Frequency: Semi-Annually

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 83

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/22/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Quarterly

PFAS: PFOA & PFOS Site Listing

PFAS have been widely used in numerous industrial and residential applications since the 1950a??s. Their stability and unique chemical properties produce waterproof, stain resistant, and nonstick qualities in products. They are found in some firefighting foams and a wide range of consumer products such as carpet treatments, non-stick cookware, water-resistant fabrics, food packaging materials, and personal care products.

Date of Government Version: 03/29/2018
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 54

Source: Ohio EPA
Telephone: 614-644-2752
Last EDR Contact: 03/15/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Varies

Local Lists of Registered Storage Tanks

ARCHIVE UST: Archived Underground Storage Tank Sites

Underground storage tank records that have been removed from the Underground Storage Tank database.

Date of Government Version: 11/09/2020
Date Data Arrived at EDR: 11/11/2020
Date Made Active in Reports: 01/28/2021
Number of Days to Update: 78

Source: Department of Commerce, Division of State Fire Marshal
Telephone: 614-752-7938
Last EDR Contact: 02/10/2021
Next Scheduled EDR Contact: 05/24/2021
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/18/2021
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 04/01/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/16/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 85

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/24/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

SPILLS: Emergency Response Database

Incidents reported to the Emergency Response Unit. The focus of the ER program is to minimize the impact on the environment from accidental releases, spills, and unauthorized discharges from any fixed or mobile sources. Incidents involving petroleum products, hazardous materials, hazardous waste, abandoned drums, or other materials which may pose as a pollution threat to the state?s water, land, or air should be reported immediately. Not all incidents included in the database are actual SPILLS, they can simply be reported incidents.

Date of Government Version: 11/02/2020
Date Data Arrived at EDR: 11/04/2020
Date Made Active in Reports: 01/27/2021
Number of Days to Update: 84

Source: Ohio EPA
Telephone: 614-644-2084
Last EDR Contact: 02/03/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Semi-Annually

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 09/13/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 55

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SPILLS 80: SPILLS80 data from FirstSearch

Spills 80 includes those spill and release records available from FirstSearch databases prior to 1990. Typically, they may include chemical, oil and/or hazardous substance spills recorded before 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 80.

Date of Government Version: 04/24/2004
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 03/01/2013
Number of Days to Update: 57

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 02/11/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 04/05/2021
Number of Days to Update: 47

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 02/17/2021
Next Scheduled EDR Contact: 05/31/2021
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/16/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/09/2021
Next Scheduled EDR Contact: 05/24/2021
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/02/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/05/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/17/2020
Date Made Active in Reports: 09/10/2020
Number of Days to Update: 85

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/19/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 08/14/2020
Date Made Active in Reports: 11/04/2020
Number of Days to Update: 82

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/02/2021
Next Scheduled EDR Contact: 05/31/2021
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 01/20/2021
Date Data Arrived at EDR: 01/21/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 60

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/20/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/18/2021
Number of Days to Update: 35

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 04/01/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/02/2020
Date Data Arrived at EDR: 11/12/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 74

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/19/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 03/05/2021
Number of Days to Update: 50

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 03/11/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/19/2020
Date Data Arrived at EDR: 01/08/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 73

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/05/2020
Date Data Arrived at EDR: 08/10/2020
Date Made Active in Reports: 10/08/2020
Number of Days to Update: 59

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 04/16/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 12/01/2020
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 70

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 03/05/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/02/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 02/05/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 03/25/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80
Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 01/13/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 68

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/22/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 151

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/06/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 04/28/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/18/2021
Next Scheduled EDR Contact: 05/31/2021
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 26

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 04/01/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/23/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 63

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 02/24/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Semi-Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 11/24/2020
Date Data Arrived at EDR: 11/30/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 56

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 03/01/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Quarterly

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 05/06/2020
Date Data Arrived at EDR: 05/27/2020
Date Made Active in Reports: 08/13/2020
Number of Days to Update: 78

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/26/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/26/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 12/11/2020
Date Data Arrived at EDR: 12/11/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 81

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 03/10/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/03/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 04/05/2021
Number of Days to Update: 33

Source: EPA
Telephone: (312) 353-2000
Last EDR Contact: 03/03/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/17/2020
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 02/26/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 07/02/2020
Date Made Active in Reports: 09/17/2020
Number of Days to Update: 77

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 04/13/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 01/02/2021
Date Data Arrived at EDR: 01/08/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 04/06/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/17/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 33

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/17/2021
Next Scheduled EDR Contact: 05/31/2021
Data Release Frequency: Quarterly

AIRS: Title V Permits Listing

A listing of Title V Permits issued by the Division of Air Pollution Control. It is a federal operating permit program adopted and implemented by the state. The basic program elements typically specify that major sources will submit an operating application to the specified state environmental regulatory agency according to a schedule.

Date of Government Version: 12/17/2020
Date Data Arrived at EDR: 12/18/2020
Date Made Active in Reports: 03/11/2021
Number of Days to Update: 83

Source: Ohio EPA
Telephone: 614-644-2270
Last EDR Contact: 03/29/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Quarterly

ASBESTOS: Asbestos Notification Listing

A listing of notifications site locations with abatement and demolition dates.

Date of Government Version: 01/26/2021
Date Data Arrived at EDR: 01/27/2021
Date Made Active in Reports: 04/20/2021
Number of Days to Update: 83

Source: Ohio EPA
Telephone: 614-466-3770
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Varies

COAL ASH: Coal Ash Disposal Site Listing

A listing of coal ash disposal site locations.

Date of Government Version: 04/13/2015
Date Data Arrived at EDR: 04/16/2015
Date Made Active in Reports: 05/29/2015
Number of Days to Update: 43

Source: Ohio EPA
Telephone: 614-644-2134
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

CRO: Cessation of Regulated Operations Facility Listing

"Cessation of Regulated Operations" means the discontinuation or termination of regulated operations or the finalizing of any transaction or proceeding through which those operations are discontinued. "Regulated Operations" means the production, use, storage or handling of regulated substances.

Date of Government Version: 10/26/2020
Date Data Arrived at EDR: 11/10/2020
Date Made Active in Reports: 01/27/2021
Number of Days to Update: 78

Source: Ohio EPA
Telephone: 614-644-3065
Last EDR Contact: 02/05/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Varies

DRYCLEANERS: Drycleaner Facility Listing

A listing of drycleaner facility locations.

Date of Government Version: 12/17/2020
Date Data Arrived at EDR: 12/18/2020
Date Made Active in Reports: 03/11/2021
Number of Days to Update: 83
Source: Ohio EPA
Telephone: 614-644-3469
Last EDR Contact: 03/22/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Semi-Annually

Financial Assurance: Financial Assurance Information Listing
Financial assurance information.

Date of Government Version: 12/05/2017
Date Data Arrived at EDR: 12/08/2017
Date Made Active in Reports: 01/08/2018
Number of Days to Update: 31
Source: Ohio EPA
Telephone: 614-644-2955
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

FINANCIAL ASSURANCE 3: Financial Assurance3 Information Listing
Information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 04/09/2021
Date Data Arrived at EDR: 04/13/2021
Date Made Active in Reports: 04/27/2021
Number of Days to Update: 14
Source: Ohio EPA
Telephone: 614-644-2621
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

HIST USD: Urban Setting Designations Database
A USD may be requested for properties participating in the VAP when there is no current or future use of the ground water by local residents for drinking, showering, bathing or cooking. In these areas, an approved USD would lower the cost of cleanup and promote economic redevelopment while still protecting public health and safety. If these USDs were to be approved, the ground water cleanup or response requirements for the areas could be lessened. The Ohio EPA director may approve a USD request based on a demonstration that the USD requirements are met and an evaluation of existing and future uses of ground water in the area. The Ohio EPA director’s decision on approval or denial of the request is needed before cleanup requirements for the site can be determined. This database is no longer updated or maintained by the state agency.

Date of Government Version: 05/10/2005
Date Data Arrived at EDR: 04/25/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 16
Source: Ohio EPA
Telephone: 614-644-3749
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

LEAD: Lead Inspections Listing
Department of Health lead inspections included in the Environmental Licensing System.

Date of Government Version: 12/11/2020
Date Data Arrived at EDR: 12/11/2020
Date Made Active in Reports: 03/03/2021
Number of Days to Update: 82
Source: Department of Health
Telephone: 614-466-3543
Last EDR Contact: 03/19/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Quarterly

NPDES: NPDES General Permit List
General information regarding NPDES (National Pollutant Discharge Elimination System) permits.

Date of Government Version: 11/02/2020
Date Data Arrived at EDR: 11/04/2020
Date Made Active in Reports: 01/26/2021
Number of Days to Update: 83
Source: Ohio EPA
Telephone: 614-644-2031
Last EDR Contact: 02/03/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Quarterly

VAPOR: Vapor Intrusion
A listing of vapor intrusion related sites.

Date of Government Version: 06/16/2020
Date Data Arrived at EDR: 06/18/2020
Date Made Active in Reports: 09/01/2020
Number of Days to Update: 75

Source: Ohio EPA
Telephone: 614-644-2924
Last EDR Contact: 03/15/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Varies

TOWNGAS: DERR Towngas Database
The database includes 82 very old sites (circa 1895) which produced gas from coal for street lighting. Most visual evidence of these sites has disappeared, however the potential for buried coal tar remains. The database is no longer in active use.

Date of Government Version: 07/28/1992
Date Data Arrived at EDR: 02/21/2003
Date Made Active in Reports: 03/05/2003
Number of Days to Update: 12

Source: Ohio EPA
Telephone: 614-644-3749
Last EDR Contact: 02/12/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UIC: Underground Injection Wells Listing
A listing of underground injection well locations.

Date of Government Version: 10/08/2020
Date Data Arrived at EDR: 10/30/2020
Date Made Active in Reports: 11/04/2020
Number of Days to Update: 5

Source: Ohio EPA
Telephone: 614-644-2752
Last EDR Contact: 02/05/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Varies

USD: Urban Setting Designation Sites
A USD may be requested for properties participating in the VAP when there is no current or future use of the ground water by local residents for drinking, showering, bathing or cooking. In these areas, an approved USD would lower the cost of cleanup and promote economic redevelopment while still protecting public health and safety. If these USDs were to be approved, the ground water cleanup or response requirements for the areas could be lessened. The Ohio EPA director may approve a USD request based on a demonstration that the USD requirements are met and an evaluation of existing and future uses of ground water in the area. The Ohio EPA director's decision on approval or denial of the request is needed before cleanup requirements for the site can be determined.

Date of Government Version: 10/23/2020
Date Data Arrived at EDR: 11/04/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 82

Source: Ohio EPA
Telephone: 614-644-3749
Last EDR Contact: 02/05/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Semi-Annually

PCS ENF: Enforcement data
No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 10/21/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 3

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 02/26/2021
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: Varies

PCS INACTIVE: Listing of Inactive PCS Permits

An inactive permit is a facility that has shut down or is no longer discharging.

Date of Government Version: 11/05/2014
Date Data Arrived at EDR: 01/06/2015
Date Made Active in Reports: 05/06/2015
Number of Days to Update: 120

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

PCS: Permit Compliance System

PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Ohio Environmental Procetion Agency in Ohio.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Ohio Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Commerce in Ohio.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/20/2013
Number of Days to Update: 172

Source: Department of Commerce
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 10/20/2020
Date Made Active in Reports: 11/02/2020
Number of Days to Update: 13

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/12/2021
Next Scheduled EDR Contact: 05/24/2021
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 04/29/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 72

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 01/29/2021
Next Scheduled EDR Contact: 05/10/2021
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 02/24/2021
Number of Days to Update: 13

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/09/2021
Next Scheduled EDR Contact: 05/31/2021
Data Release Frequency: Annually

VT MANIFEST: Hazardous Waste Manifest Data

Hazardous waste manifest information.

Date of Government Version: 10/28/2019
Date Data Arrived at EDR: 10/29/2019
Date Made Active in Reports: 01/09/2020
Number of Days to Update: 72

Source: Department of Environmental Conservation
Telephone: 802-241-3443
Last EDR Contact: 04/12/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/08/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Annually

Oil/Gas Pipelines

Source: Endeavor Business Media

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data

Source: Endeavor Business Media

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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Child Day Care Facilities
Source: Department of Job & Family Services
Telephone: 614-466-6282

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

AMHERST #2
1161 MILAN AVENUE
AMHERST, OH 44001

TARGET PROPERTY COORDINATES

Latitude (North):	41.401509 - 41° 24’ 5.43’’
Longitude (West):	82.251373 - 82° 15’ 4.94’’
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	395395.0
UTM Y (Meters):	4583873.0
Elevation:	701 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5965978 VERMILION EAST, OH
Version Date:	2013
Northeast Map:	5966074 LORAIN, OH
Version Date:	2013

EDR’s GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

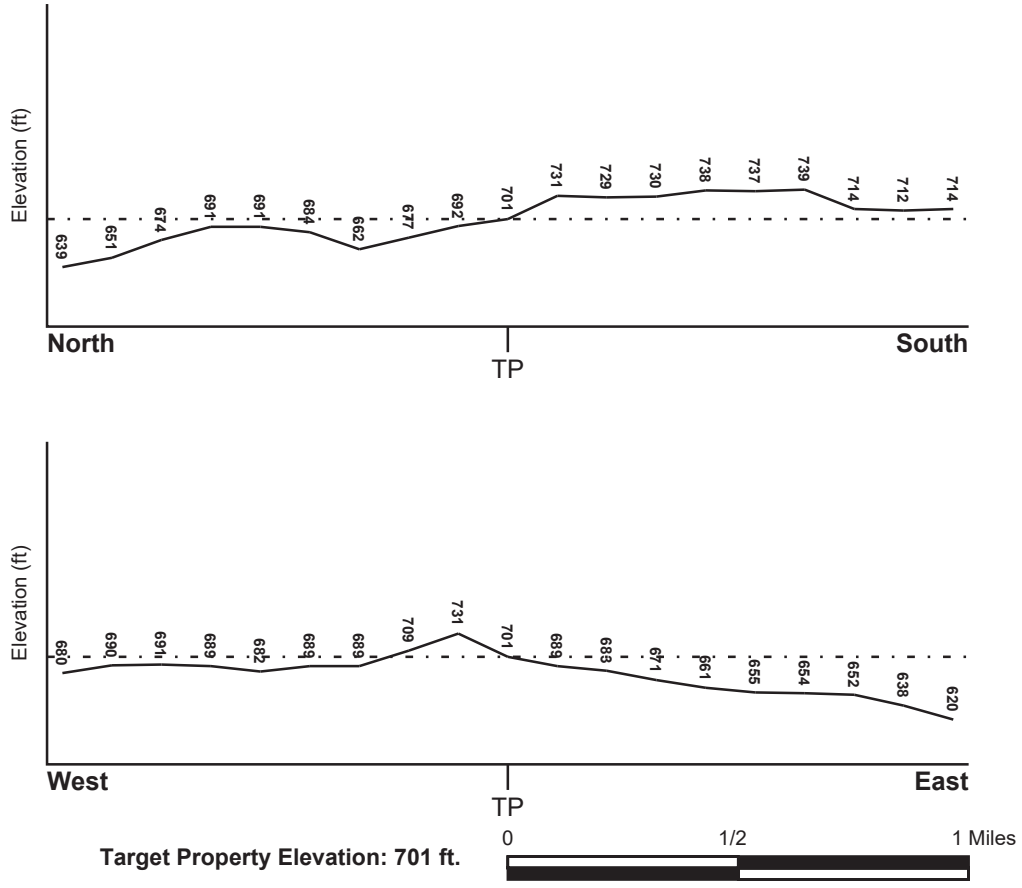
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NNE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
39093C0094D	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
39093C0092D	FEMA FIRM Flood data
39093C0111D	FEMA FIRM Flood data
39093C0113D	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

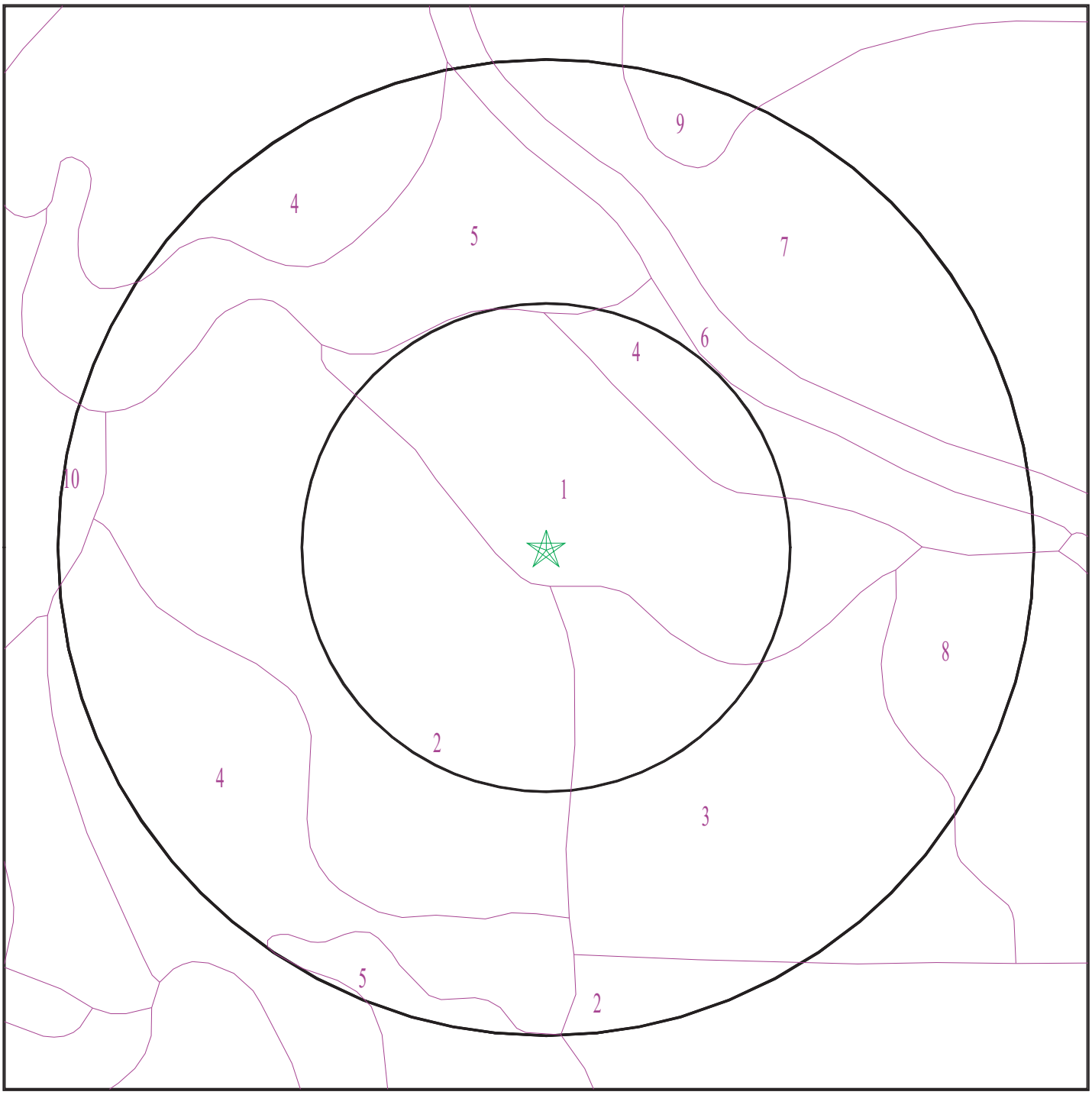
Era:	Paleozoic
System:	Mississippian
Series:	Mississippian
Code:	M *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 6474298.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Amherst #2	CLIENT:	Power Engineers
ADDRESS:	1161 Milan Avenue Amherst OH 44001	CONTACT:	Lindsey Branham
		INQUIRY #:	6474298.2s
LAT/LONG:	41.401509 / 82.251373	DATE:	April 30, 2021 2:23 pm

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Oshtemo

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 42.34	Max: 7.8 Min: 5.6
2	11 inches	29 inches	gravelly sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 42.34	Max: 7.8 Min: 5.6
3	29 inches	61 inches	loamy sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 42.34	Max: 7.8 Min: 5.6

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 2

Soil Component Name: Quarries

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class:
Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

Soil Map ID: 3

Soil Component Name: Elnora

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 69 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 42.34	Max: 7.3 Min: 5.1

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	11 inches	33 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 42.34	Max: 7.3 Min: 5.1
3	33 inches	59 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 42.34	Max: 7.3 Min: 5.1

Soil Map ID: 4

Soil Component Name: Tyner

Soil Surface Texture: loamy sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 141.14 Min: 42.34	Max: 6.5 Min: 5.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	9 inches	40 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 141.14 Min: 42.34	Max: 6.5 Min: 5.1
3	40 inches	59 inches	sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 141.14 Min: 42.34	Max: 6.5 Min: 5.1

Soil Map ID: 5

Soil Component Name: Olmsted

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class B/D - Drained/undrained hydrology class of soils that can be drained and are classified.

Soil Drainage Class: Very poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42.34 Min: 14.11	Max: 7.3 Min: 5.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	9 inches	35 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42.34 Min: 14.11	Max: 7.3 Min: 5.6
3	35 inches	59 inches	loamy fine sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42.34 Min: 14.11	Max: 7.3 Min: 5.6

Soil Map ID: 6

Soil Component Name: Tyner

Soil Surface Texture: loamy sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 141.14 Min: 42.34	Max: 6.5 Min: 5.1

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	9 inches	46 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 141.14 Min: 42.34	Max: 6.5 Min: 5.1
3	46 inches	59 inches	sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 141.14 Min: 42.34	Max: 6.5 Min: 5.1

Soil Map ID: 7

Soil Component Name: Miner

Soil Surface Texture: silty clay loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Very poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.41 Min: 0.42	Max: 7.3 Min: 5.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	9 inches	31 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.41 Min: 0.42	Max: 7.3 Min: 5.6
3	31 inches	59 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.41 Min: 0.42	Max: 7.3 Min: 5.6

Soil Map ID: 8

Soil Component Name: Jimtown

Soil Surface Texture: sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 31 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 42.34	Max: 7.3 Min: 5.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	9 inches	37 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 42.34	Max: 7.3 Min: 5.6
3	37 inches	59 inches	gravelly loamy sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 42.34	Max: 7.3 Min: 5.6

Soil Map ID: 9

Soil Component Name: Lockport

Soil Surface Texture: silty clay loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 31 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 1.41 Min: 0	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	11 inches	38 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 1.41 Min: 0	Max: Min:
3	38 inches	42 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 1.41 Min: 0	Max: Min:

Soil Map ID: 10

Soil Component Name: Stafford

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 15 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 42.34	Max: 6 Min: 5.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	11 inches	31 inches	loamy fine sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 42.34	Max: 6 Min: 5.1
3	31 inches	59 inches	loamy fine sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 42.34	Max: 6 Min: 5.1

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	OHD800000089602	1/8 - 1/4 Mile SSE
A2	OHD800000089601	1/8 - 1/4 Mile WNW
B3	OHD800000229331	1/8 - 1/4 Mile SSW
A4	OHD800000089600	1/8 - 1/4 Mile WNW
5	OHD800000393176	1/8 - 1/4 Mile SE
B6	OHD800000090585	1/4 - 1/2 Mile SSW
7	OHD800000089603	1/4 - 1/2 Mile South
B8	OHD800000090121	1/4 - 1/2 Mile SSW
9	OHD800000094625	1/4 - 1/2 Mile SSE
C10	OHD800000341329	1/4 - 1/2 Mile SSW
D11	OHD800000089599	1/4 - 1/2 Mile North
E12	OHD800000089792	1/4 - 1/2 Mile South
D13	OHD800000089598	1/4 - 1/2 Mile North
C14	OHD800000090584	1/4 - 1/2 Mile SW
E15	OHD800000447013	1/4 - 1/2 Mile South
E16	OHD800000363523	1/4 - 1/2 Mile South
F17	OHD800000089589	1/4 - 1/2 Mile WSW
18	OHD800000367757	1/4 - 1/2 Mile SW
19	OHD800000363522	1/4 - 1/2 Mile West
F20	OHD800000089590	1/4 - 1/2 Mile SW
F21	OHD800000089591	1/4 - 1/2 Mile SW
22	OHD800000094626	1/4 - 1/2 Mile SSE
G23	OHD800000089793	1/4 - 1/2 Mile South
G24	OHD800000089794	1/4 - 1/2 Mile South
G25	OHD800000089795	1/4 - 1/2 Mile South
G26	OHD800000096708	1/4 - 1/2 Mile South
H27	OHD800000089593	1/4 - 1/2 Mile SW
G28	OHD800000416397	1/4 - 1/2 Mile South
I29	OHD800000089588	1/4 - 1/2 Mile WSW
I30	OHD800000333059	1/2 - 1 Mile WSW
I31	OHD800000089587	1/2 - 1 Mile WSW
G32	OHD800000089796	1/2 - 1 Mile South
G33	OHD800000089797	1/2 - 1 Mile South
34	OHD800000089592	1/2 - 1 Mile WSW
H35	OHD800000341325	1/2 - 1 Mile SW
H36	OHD800000089594	1/2 - 1 Mile SW
J37	OHD800000089596	1/2 - 1 Mile SW
J38	OHD800000089597	1/2 - 1 Mile SW
J39	OHD800000089595	1/2 - 1 Mile SW
K40	OHD800000311960	1/2 - 1 Mile WNW
K41	OHD800000090576	1/2 - 1 Mile WNW
K42	OHD800000090575	1/2 - 1 Mile WNW
43	OHD800000285751	1/2 - 1 Mile SW

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

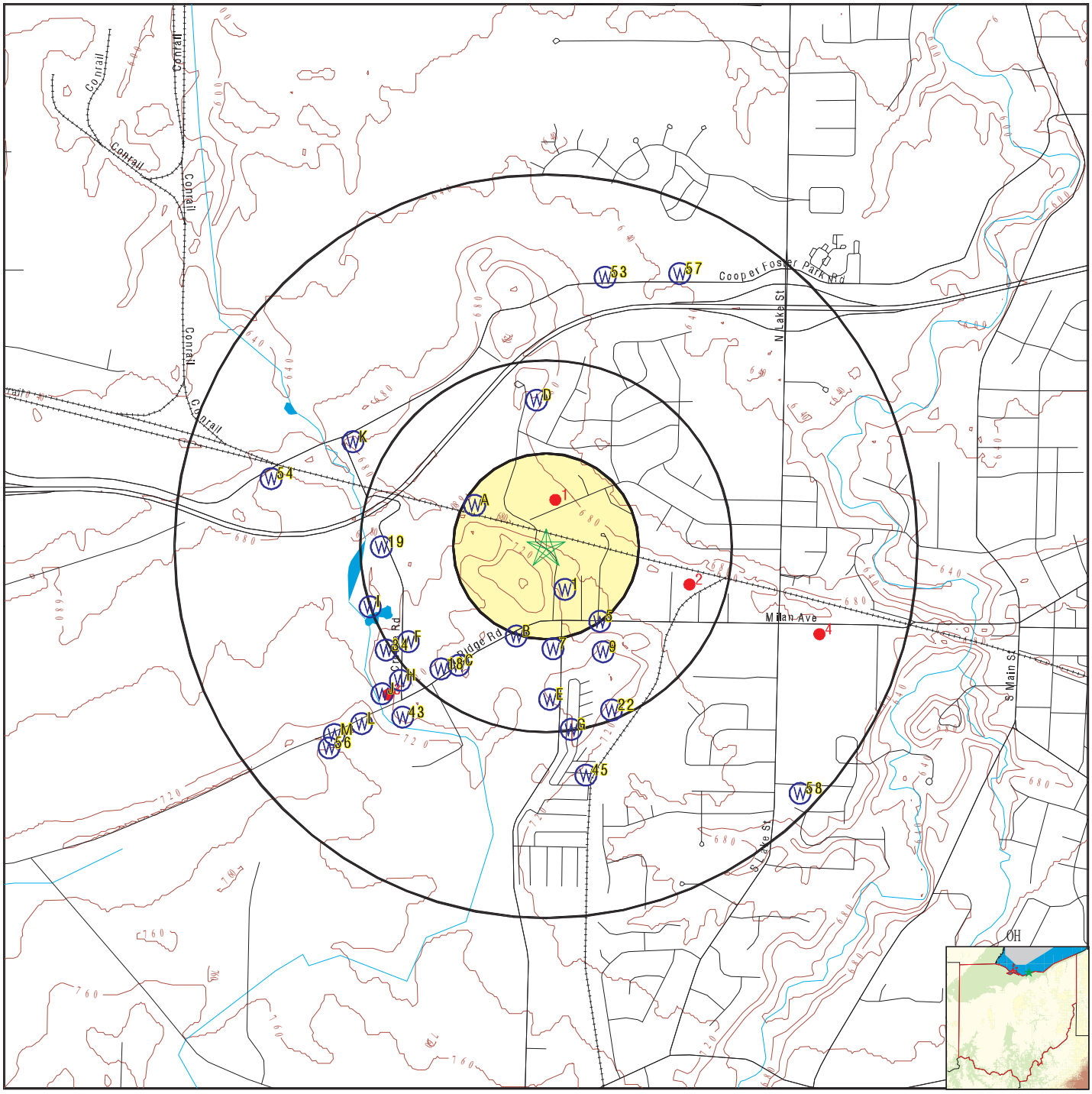
MAP ID	WELL ID	LOCATION FROM TP
J44	OHD800000417337	1/2 - 1 Mile SW
45	OHD800000333062	1/2 - 1 Mile South
J46	OHD800000090583	1/2 - 1 Mile SW
L47	OHD800000090582	1/2 - 1 Mile SW
L48	OHD800000090579	1/2 - 1 Mile SW
L49	OHD800000090580	1/2 - 1 Mile SW
L50	OHD800000090581	1/2 - 1 Mile SW
L51	OHD800000090578	1/2 - 1 Mile SW
M52	OHD800000341324	1/2 - 1 Mile SW
53	OHD800000090119	1/2 - 1 Mile NNE
54	OHD800000095732	1/2 - 1 Mile WNW
M55	OHD800000090577	1/2 - 1 Mile SW
56	OHD800000333061	1/2 - 1 Mile SW
57	OHD800000090120	1/2 - 1 Mile NNE
58	OHD800000090124	1/2 - 1 Mile SE

OTHER STATE DATABASE INFORMATION

STATE OIL/GAS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	OHOG40000122237	1/8 - 1/4 Mile NNE
2	OHOG40000122234	1/4 - 1/2 Mile ESE
3	OHOG40000121638	1/2 - 1 Mile SW
4	OHOG40000121688	1/2 - 1 Mile ESE

PHYSICAL SETTING SOURCE MAP - 6474298.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Oil, gas or related wells

SITE NAME:	Amherst #2	CLIENT:	Power Engineers
ADDRESS:	1161 Milan Avenue Amherst OH 44001	CONTACT:	Lindsey Branham
		INQUIRY #:	6474298.2s
LAT/LONG:	41.401509 / 82.251373	DATE:	April 30, 2021 2:23 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database | EDR ID Number

1
SSE
1/8 - 1/4 Mile
Higher

OH WELLS **OHD800000089602**

Database:	Water Well Database	Well Log #:	429199
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	1	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	35
Completion Date:	1972 517	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

A2
WNW
1/8 - 1/4 Mile
Lower

OH WELLS **OHD800000089601**

Database:	Water Well Database	Well Log #:	238792
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	0	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	50
Completion Date:	1960 329	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

B3
SSW
1/8 - 1/4 Mile
Higher

OH WELLS **OHD800000229331**

Database:	Water Well Database	Well Log #:	781047
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	2	Draw Down:	70
Test Duration:	2	Surface Water Level:	14
Date Measured:	1997 514	Casing Height:	0
Screen Length:	0	Total Depth:	90
Completion Date:	1998 728	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported

Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

A4
WNW
1/8 - 1/4 Mile
Lower

OH WELLS **OHD800000089600**

Database:	Water Well Database	Well Log #:	238797
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE AND SANDSTONE	Permit #:	Not Reported
Test Rate:	40	Draw Down:	0
Test Duration:	14	Surface Water Level:	6
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	16
Completion Date:	1960 5 3	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	684	Well Drilled By:	Not Reported

5
SE
1/8 - 1/4 Mile
Higher

OH WELLS **OHD800000393176**

Database:	Water Well Database	Well Log #:	1012784
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SANDSTONE	Permit #:	Not Reported
Test Rate:	15	Draw Down:	10
Test Duration:	1	Surface Water Level:	44
Date Measured:	2011 5 9	Casing Height:	1
Screen Length:	0	Total Depth:	84
Completion Date:	2011 5 9	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

B6
SSW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000090585**

Database:	Water Well Database	Well Log #:	333077
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	0	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0

Screen Length:	0	Total Depth:	67
Completion Date:	1965 9 4	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

7
South **OH WELLS** **OHD800000089603**
1/4 - 1/2 Mile
Higher

Database:	Water Well Database	Well Log #:	353474
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	FILL MATERIAL	Permit #:	Not Reported
Test Rate:	0	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	75
Completion Date:	1966 831	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

B8
SSW **OH WELLS** **OHD800000090121**
1/4 - 1/2 Mile
Higher

Database:	Water Well Database	Well Log #:	207422
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	0	Draw Down:	0
Test Duration:	0	Surface Water Level:	16
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	35
Completion Date:	19571022	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	717	Well Drilled By:	Not Reported

9
SSE **OH WELLS** **OHD800000094625**
1/4 - 1/2 Mile
Higher

Database:	Water Well Database	Well Log #:	168329
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported

Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	3	Draw Down:	40
Test Duration:	3	Surface Water Level:	30
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	70
Completion Date:	1956 623	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	719	Well Drilled By:	Not Reported

C10
SSW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000341329**

Database:	Water Well Database	Well Log #:	168876
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SANDSTONE	Permit #:	Not Reported
Test Rate:	0	Draw Down:	10
Test Duration:	1	Surface Water Level:	5
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	50
Completion Date:	1956 716	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	734	Well Drilled By:	Not Reported

D11
North
1/4 - 1/2 Mile
Lower

OH WELLS **OHD800000089599**

Database:	Water Well Database	Well Log #:	477326
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	1	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	60
Completion Date:	1975 311	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database | EDR ID Number

E12
South
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000089792**

Database:	Water Well Database	Well Log #:	465763
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	24	Draw Down:	45
Test Duration:	.5	Surface Water Level:	18
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	85
Completion Date:	1974 3 5	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	723	Well Drilled By:	Not Reported

D13
North
1/4 - 1/2 Mile
Lower

OH WELLS **OHD800000089598**

Database:	Water Well Database	Well Log #:	472696
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND	Permit #:	Not Reported
Test Rate:	0	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	40
Completion Date:	1975 4 5	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

C14
SW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000090584**

Database:	Water Well Database	Well Log #:	300167
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	1	Draw Down:	45
Test Duration:	.3	Surface Water Level:	11
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	45
Completion Date:	1963 828	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported

Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	717	Well Drilled By:	Not Reported

E15
South
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000447013**

Database:	Water Well Database	Well Log #:	387577
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SANDSTONE	Permit #:	Not Reported
Test Rate:	30	Draw Down:	50
Test Duration:	.5	Surface Water Level:	37
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	77
Completion Date:	1969 513	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	704	Well Drilled By:	Not Reported

E16
South
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000363523**

Database:	Water Well Database	Well Log #:	254669
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SANDSTONE	Permit #:	Not Reported
Test Rate:	2	Draw Down:	45
Test Duration:	.5	Surface Water Level:	20
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	50
Completion Date:	1961 320	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	720	Well Drilled By:	Not Reported

F17
WSW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000089589**

Database:	Water Well Database	Well Log #:	429181
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	15	Draw Down:	42
Test Duration:	.3	Surface Water Level:	0
Date Measured:	0	Casing Height:	0

Screen Length:	0	Total Depth:	46
Completion Date:	1972 228	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

18
SW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000367757**

Database:	Water Well Database	Well Log #:	447433
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	15	Draw Down:	33
Test Duration:	.5	Surface Water Level:	5
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	35
Completion Date:	1973 3 2	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	722	Well Drilled By:	Not Reported

19
West
1/4 - 1/2 Mile
Lower

OH WELLS **OHD800000363522**

Database:	Water Well Database	Well Log #:	465791
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	0	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	25
Completion Date:	1974 730	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

F20
SW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000089590**

Database:	Water Well Database	Well Log #:	429180
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported

Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	15	Draw Down:	30
Test Duration:	.5	Surface Water Level:	3
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	35
Completion Date:	1972 225	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	709	Well Drilled By:	Not Reported

F21
SW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000089591**

Database:	Water Well Database	Well Log #:	254662
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	1	Draw Down:	2
Test Duration:	.5	Surface Water Level:	3
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	40
Completion Date:	1961 116	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	709	Well Drilled By:	Not Reported

22
SSE
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000094626**

Database:	Water Well Database	Well Log #:	168330
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHELL	Permit #:	Not Reported
Test Rate:	5	Draw Down:	40
Test Duration:	3	Surface Water Level:	20
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	60
Completion Date:	1956 624	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	708	Well Drilled By:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database | EDR ID Number

G23
South
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000089793**

Database:	Water Well Database	Well Log #:	387575
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	5	Draw Down:	80
Test Duration:	.5	Surface Water Level:	38
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	80
Completion Date:	1969 5 7	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	702	Well Drilled By:	Not Reported

G24
South
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000089794**

Database:	Water Well Database	Well Log #:	305099
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	30	Draw Down:	35
Test Duration:	.5	Surface Water Level:	26
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	91
Completion Date:	1964 515	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	714	Well Drilled By:	Not Reported

G25
South
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000089795**

Database:	Water Well Database	Well Log #:	305098
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	10	Draw Down:	0
Test Duration:	0	Surface Water Level:	29
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	62
Completion Date:	1964 513	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported

Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	711	Well Drilled By:	Not Reported

G26
South
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000096708**

Database:	Water Well Database	Well Log #:	387574
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SANDSTONE	Permit #:	Not Reported
Test Rate:	30	Draw Down:	50
Test Duration:	.5	Surface Water Level:	37
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	81
Completion Date:	1969 515	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

H27
SW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD800000089593**

Database:	Water Well Database	Well Log #:	225419
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SANDSTONE	Permit #:	Not Reported
Test Rate:	30	Draw Down:	10
Test Duration:	1	Surface Water Level:	1
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	27
Completion Date:	1959 7 1	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	716	Well Drilled By:	Not Reported

G28
South
1/4 - 1/2 Mile
Lower

OH WELLS **OHD800000416397**

Database:	Water Well Database	Well Log #:	387576
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SANDSTONE	Permit #:	Not Reported
Test Rate:	30	Draw Down:	50
Test Duration:	.5	Surface Water Level:	35
Date Measured:	0	Casing Height:	0

Screen Length:	0	Total Depth:	86
Completion Date:	1969 515	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	705	Well Drilled By:	Not Reported

I29
WSW
1/4 - 1/2 Mile
Lower

OH WELLS **OHD800000089588**

Database:	Water Well Database	Well Log #:	381953
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	0	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	65
Completion Date:	1968 621	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

I30
WSW
1/2 - 1 Mile
Lower

OH WELLS **OHD800000333059**

Database:	Water Well Database	Well Log #:	247570
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	1	Draw Down:	0
Test Duration:	0	Surface Water Level:	13
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	65
Completion Date:	1960 731	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	679	Well Drilled By:	Not Reported

I31
WSW
1/2 - 1 Mile
Lower

OH WELLS **OHD800000089587**

Database:	Water Well Database	Well Log #:	238783
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported

Aquifer Type:	STONE	Permit #:	Not Reported
Test Rate:	30	Draw Down:	30
Test Duration:	0	Surface Water Level:	22
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	52
Completion Date:	19591130	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	668	Well Drilled By:	Not Reported

G32
South
1/2 - 1 Mile
Lower

OH WELLS **OHD800000089796**

Database:	Water Well Database	Well Log #:	208266
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	30	Draw Down:	80
Test Duration:	1	Surface Water Level:	20
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	100
Completion Date:	1958 922	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	720	Well Drilled By:	Not Reported

G33
South
1/2 - 1 Mile
Lower

OH WELLS **OHD800000089797**

Database:	Water Well Database	Well Log #:	208267
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	10	Draw Down:	80
Test Duration:	1	Surface Water Level:	20
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	87
Completion Date:	1958 922	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	721	Well Drilled By:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database | EDR ID Number

34
WSW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000089592**

Database:	Water Well Database	Well Log #:	258109
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	5	Draw Down:	0
Test Duration:	24	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	60
Completion Date:	19601219	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

H35
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000341325**

Database:	Water Well Database	Well Log #:	447428
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	STONE	Permit #:	Not Reported
Test Rate:	40	Draw Down:	25
Test Duration:	.5	Surface Water Level:	11
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	39
Completion Date:	1973 115	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	715	Well Drilled By:	Not Reported

H36
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000089594**

Database:	Water Well Database	Well Log #:	333072
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	4	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	60
Completion Date:	1965 816	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported

Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

J37
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000089596**

Database:	Water Well Database	Well Log #:	278064
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SANDSTONE	Permit #:	Not Reported
Test Rate:	5	Draw Down:	5
Test Duration:	.5	Surface Water Level:	7
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	50
Completion Date:	1962 9 5	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	703	Well Drilled By:	Not Reported

J38
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000089597**

Database:	Water Well Database	Well Log #:	477335
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	7	Draw Down:	40
Test Duration:	1	Surface Water Level:	5.5
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	45
Completion Date:	1975 528	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	705	Well Drilled By:	Not Reported

J39
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000089595**

Database:	Water Well Database	Well Log #:	313931
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	15	Draw Down:	55
Test Duration:	.3	Surface Water Level:	0
Date Measured:	0	Casing Height:	0

Screen Length:	0	Total Depth:	60
Completion Date:	1964 811	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

K40
WNW
1/2 - 1 Mile
Lower

OH WELLS **OHD800000311960**

Database:	Water Well Database	Well Log #:	300186
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	2	Draw Down:	0
Test Duration:	0	Surface Water Level:	26
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	75
Completion Date:	196310 2	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	654	Well Drilled By:	Not Reported

K41
WNW
1/2 - 1 Mile
Lower

OH WELLS **OHD800000090576**

Database:	Water Well Database	Well Log #:	239349
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	1	Draw Down:	0
Test Duration:	0	Surface Water Level:	12
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	121
Completion Date:	1961 617	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	668	Well Drilled By:	Not Reported

K42
WNW
1/2 - 1 Mile
Lower

OH WELLS **OHD800000090575**

Database:	Water Well Database	Well Log #:	239324
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported

Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	4	Draw Down:	0
Test Duration:	48	Surface Water Level:	4.5
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	60
Completion Date:	1960 517	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	676	Well Drilled By:	Not Reported

43
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000285751**

Database:	Water Well Database	Well Log #:	485738
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SANDSTONE	Permit #:	Not Reported
Test Rate:	12	Draw Down:	40
Test Duration:	1	Surface Water Level:	12
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	50
Completion Date:	1976 517	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	717	Well Drilled By:	Not Reported

J44
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000417337**

Database:	Water Well Database	Well Log #:	477336
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	30	Draw Down:	25
Test Duration:	.5	Surface Water Level:	9
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	36
Completion Date:	1975 6 2	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	701	Well Drilled By:	Not Reported

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

45
South
1/2 - 1 Mile
Higher

OH WELLS **OHD800000333062**

Database:	Water Well Database	Well Log #:	208255
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	20	Draw Down:	53
Test Duration:	2	Surface Water Level:	23
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	96
Completion Date:	195711 4	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	693	Well Drilled By:	Not Reported

J46
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000090583**

Database:	Water Well Database	Well Log #:	419916
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	7	Draw Down:	55
Test Duration:	.3	Surface Water Level:	13
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	61
Completion Date:	1971 628	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	708	Well Drilled By:	Not Reported

L47
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000090582**

Database:	Water Well Database	Well Log #:	239318
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SANDSTONE	Permit #:	Not Reported
Test Rate:	36	Draw Down:	48
Test Duration:	48	Surface Water Level:	5
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	61
Completion Date:	1960 4 4	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported

Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	719	Well Drilled By:	Not Reported

L48
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000090579**

Database:	Water Well Database	Well Log #:	413687
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	STONE	Permit #:	Not Reported
Test Rate:	40	Draw Down:	40
Test Duration:	.3	Surface Water Level:	15
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	86
Completion Date:	1971 219	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	713	Well Drilled By:	Not Reported

L49
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000090580**

Database:	Water Well Database	Well Log #:	447435
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	4	Draw Down:	35
Test Duration:	.5	Surface Water Level:	2
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	35
Completion Date:	1973 3 8	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	733	Well Drilled By:	Not Reported

L50
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000090581**

Database:	Water Well Database	Well Log #:	447436
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	7	Draw Down:	80
Test Duration:	1	Surface Water Level:	0
Date Measured:	0	Casing Height:	0

Screen Length:	0	Total Depth:	85
Completion Date:	1973 311	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

L51
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000090578**

Database:	Water Well Database	Well Log #:	413684
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	STONE	Permit #:	Not Reported
Test Rate:	25	Draw Down:	70
Test Duration:	.3	Surface Water Level:	15
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	83
Completion Date:	1971 215	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	713	Well Drilled By:	Not Reported

M52
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000341324**

Database:	Water Well Database	Well Log #:	413685
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	STONE	Permit #:	Not Reported
Test Rate:	30	Draw Down:	40
Test Duration:	.3	Surface Water Level:	11
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	84
Completion Date:	1971 216	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	717	Well Drilled By:	Not Reported

53
NNE
1/2 - 1 Mile
Lower

OH WELLS **OHD800000090119**

Database:	Water Well Database	Well Log #:	75927
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported

Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	0	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	39
Completion Date:	1951 731	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

54
WNW **OH WELLS** **OHD800000095732**
1/2 - 1 Mile
Lower

Database:	Water Well Database	Well Log #:	247577
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	0	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	50
Completion Date:	1960 823	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

M55
SW **OH WELLS** **OHD800000090577**
1/2 - 1 Mile
Higher

Database:	Water Well Database	Well Log #:	447432
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	1	Draw Down:	65
Test Duration:	1	Surface Water Level:	2
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	65
Completion Date:	1973 3 1	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	738	Well Drilled By:	Not Reported

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

56
SW
1/2 - 1 Mile
Higher

OH WELLS **OHD800000333061**

Database:	Water Well Database	Well Log #:	447434
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	3	Draw Down:	50
Test Duration:	.5	Surface Water Level:	6.5
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	50
Completion Date:	1973 3 6	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	734	Well Drilled By:	Not Reported

57
NNE
1/2 - 1 Mile
Lower

OH WELLS **OHD800000090120**

Database:	Water Well Database	Well Log #:	75929
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	STONE	Permit #:	Not Reported
Test Rate:	0	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	30
Completion Date:	1951 816	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

58
SE
1/2 - 1 Mile
Lower

OH WELLS **OHD800000090124**

Database:	Water Well Database	Well Log #:	120694
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate:	0	Draw Down:	0
Test Duration:	0	Surface Water Level:	0
Date Measured:	0	Casing Height:	0
Screen Length:	0	Total Depth:	47
Completion Date:	1954 9 1	Depth to Bedrock:	0
Drill Year:	Not Reported	Well Seal Rpt #:	0
Screen Diameter:	0	Screen Type:	Not Reported

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Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity:	0	Pump Installed By:	Not Reported
Water Level Elevation:	0	Well Drilled By:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance

Database EDR ID Number

1
NNE **OIL_GAS** **OHOG40000122237**
1/8 - 1/4 Mile

API Permit #:	34093605090000	API Well Hole #:	60509
Well Permit #:	0509	Well #:	1
Alt Well #:	Not Reported	Owner #:	7668
Well Status:	Final Restoration	Date Status Changed:	17-FEB-05
Well Type:	Oil & Gas	Well Name:	LAWRENCE WILLIAM 1
Const Permit Approved:	08-JUL-04	Well Completion:	Not Reported
Completion Date:	Not Reported	SPUD Date:	Not Reported
Date TD Reached:	Not Reported	Plugged/Abandoned Date:	08-JUL-04
Original SPUD Date:	Not Reported	Lease Name:	LAWRENCE WILLIAM
Operator Well #:	Not Reported	Oil Field #:	Not Reported
Surface Owner:	Not Reported	Total Depth:	Not Reported
ODNR Current Class:	Not Reported	Init Production-Oil:	Not Reported
Init Production-Gas:	Not Reported	Init Production-Brine:	Not Reported
Original Owner:	LAPOS CONSTRUCTION INC	EPA Permit:	Not Reported
Fed Lease:	Not Reported	Lease #:	Not Reported
Original Lease #:	Not Reported	First Prod Date:	Not Reported
1st Producing Formation:	Not Reported	2nd Producing Formation:	Not Reported

Comments: NO PREVIOUS RECORDS OF WELL. HAROLD MORAVY, INSPECTOR, PROVIVED GPS LOCATION OF WELL. DC UNDER FOUNDATION OF HOME THAT IS BEING TORN DOWN TO BUILD A NEW HOME. WELL TO BE PLUGGED PRIVATE FUNDS.

2
ESE **OIL_GAS** **OHOG40000122234**
1/4 - 1/2 Mile

API Permit #:	34093605060000	API Well Hole #:	60506
Well Permit #:	0506	Well #:	OHLO-2
Alt Well #:	Not Reported	Owner #:	9998
Well Status:	Final Restoration	Date Status Changed:	12-SEP-06
Well Type:	Stratigraphic Test	Well Name:	J RUTH
Const Permit Approved:	Not Reported	Well Completion:	Not Reported
Completion Date:	Not Reported	SPUD Date:	01-JAN-00
Date TD Reached:	Not Reported	Plugged/Abandoned Date:	Not Reported
Original SPUD Date:	Not Reported	Lease Name:	J RUTH
Operator Well #:	Not Reported	Oil Field #:	Not Reported
Surface Owner:	Not Reported	Total Depth:	630
ODNR Current Class:	STRT	Init Production-Oil:	Not Reported
Init Production-Gas:	Not Reported	Init Production-Brine:	Not Reported
Original Owner:	PHILLIPS PET CO	EPA Permit:	Not Reported
Fed Lease:	Not Reported	Lease #:	Not Reported
Original Lease #:	Not Reported	First Prod Date:	Not Reported
1st Producing Formation:	Not Reported	2nd Producing Formation:	Not Reported

Comments: RBDMS Rec Default Spud Date of 01/01/1900 used for existing legacy RBDMS well for RICS database development conversion requirement due to no spud date on record.

Map ID
Direction
Distance

Database EDR ID Number

3
SW
1/2 - 1 Mile

OIL_GAS **OHOG40000121638**

API Permit #:	34093214330000	API Well Hole #:	21433
Well Permit #:	1433	Well #:	1
Alt Well #:	Not Reported	Owner #:	6118
Well Status:	Final Restoration	Date Status Changed:	21-SEP-00
Well Type:	Oil & Gas	Well Name:	HARDY THOMAS E JR 1
Const Permit Approved:	22-APR-98	Well Completion:	Not Reported
Completion Date:	Not Reported	SPUD Date:	Not Reported
Date TD Reached:	Not Reported	Plugged/Abandoned Date:	14-MAY-98
Original SPUD Date:	Not Reported	Lease Name:	HARDY THOMAS E JR
Operator Well #:	Not Reported	Oil Field #:	Not Reported
Surface Owner:	Not Reported	Total Depth:	Not Reported
ODNR Current Class:	Not Reported	Init Production-Oil:	Not Reported
Init Production-Gas:	Not Reported	Init Production-Brine:	Not Reported
Original Owner:	HARDING THOMAS E	EPA Permit:	Not Reported
Fed Lease:	Not Reported	Lease #:	Not Reported
Original Lease #:	Not Reported	First Prod Date:	Not Reported
1st Producing Formation:	341010	2nd Producing Formation:	Not Reported
Comments:	RBDMS Rec		

4
ESE
1/2 - 1 Mile

OIL_GAS **OHOG40000121688**

API Permit #:	34093214880000	API Well Hole #:	21488
Well Permit #:	1488	Well #:	1
Alt Well #:	Not Reported	Owner #:	6717
Well Status:	Final Restoration	Date Status Changed:	01-MAR-05
Well Type:	Oil & Gas	Well Name:	AMHERST 1
Const Permit Approved:	23-MAR-00	Well Completion:	Not Reported
Completion Date:	Not Reported	SPUD Date:	Not Reported
Date TD Reached:	Not Reported	Plugged/Abandoned Date:	06-APR-00
Original SPUD Date:	Not Reported	Lease Name:	AMHERST
Operator Well #:	Not Reported	Oil Field #:	Not Reported
Surface Owner:	Not Reported	Total Depth:	Not Reported
ODNR Current Class:	Not Reported	Init Production-Oil:	Not Reported
Init Production-Gas:	Not Reported	Init Production-Brine:	Not Reported
Original Owner:	BREWER LEWIS L	EPA Permit:	Not Reported
Fed Lease:	Not Reported	Lease #:	Not Reported
Original Lease #:	Not Reported	First Prod Date:	Not Reported
1st Producing Formation:	341010	2nd Producing Formation:	Not Reported
Comments:	RBDMS Rec		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: OH Radon

Radon Test Results

Zipcode	Num Tests	Maximum	Minimum	Arith Mean	Geo Mean
44001	467	35.7	0.1	2.23	0.87

Federal EPA Radon Zone for LORAIN County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 44001

Number of sites tested: 1

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	Not Reported	Not Reported	Not Reported	Not Reported
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	5.100 pCi/L	0%	100%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Public Water System Data
Source: Ohio Environmental Protection Agency
Telephone: 614-644-2752
The database includes community, transient non-community and non-transient non-community water wells; and source treatment unit locations.

Water Treatment Facilities
Source: Ohio Environmental Protection Agency
Telephone: 614-644-2752

Water Well Database
Source: Department of Natural Resources
Telephone: 614-265-6740

Monitoring Water Wells Listing
Source: Department of Natural Resources
Telephone: 614-265-6740

OTHER STATE DATABASE INFORMATION

Oil and Gas Wells Listing
Source: Department of Natural Resources
Telephone: 614-265-6740
A listing of oil and gas well locations in the state.

RADON

State Database: OH Radon
Source: Department of Health
Telephone: 614-644-2727
Radon Statistics for Zip Code Areas

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

STREET AND ADDRESS INFORMATION

POWER ENGINEERS, INC.
11733 CHESTERDALE ROAD
CINCINNATI, OHIO 45246 USA

PHONE 513-326-1500
FAX 513-326-1550

November 18, 2021

Mr. Chris Music
Emerald Energy & Exploration Land Company
640 Kentucky Highway 80
Prestonsburg, KY 41653

Subject: Soil Sampling and Analysis Report
American Municipal Power Transmission Amherst #2 Project
Amherst, Lorain County, Ohio

Dear Mr. Music:

POWER Engineers, Inc. (POWER) is pleased to submit this report to document the results of recent soil sampling and analysis that was completed for the Amherst #2 project in Amherst, Lorain County, Ohio. The remainder of this letter report details the background, methods, and findings of the investigation.

BACKGROUND

POWER completed a Phase I Environmental Site Assessment (ESA) for the Amherst #2 project Survey Area in July 2021. The Phase I ESA identified the historic presence of a fruit orchard in the eastern portion of the Survey Area from 1934 or earlier until at least the early 1980s. Lead and arsenic-containing pesticides were commonly used in fruit orchards from the late 1800s until the mid-1900s, a time period that partially overlaps the historic orchard in the Survey Area.

The Phase I ESA report concluded that elevated concentrations of lead and arsenic may be present in soils of the Survey Area. The soil sampling and analysis investigation documented in this report was designed to evaluate the Study Area for the presence of elevated metals concentrations so that appropriate waste management and construction worker health and safety measures, if needed, could be identified.

INVESTIGATION METHODS

The soil sampling and analysis investigation included the following tasks:

- Utility locating to identify the locations of underground utilities
- Collection of soil samples from 12 locations in the area of the former orchard
- Analysis of 30 soil samples for the metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver – a group of metals commonly referred to as the "RCRA metals"
- Comparison of analytical results to appropriate screening levels and regulatory standards

Each of these tasks is described below.

Utility Locating

POWER identified 12 soil sampling locations in the area of the former orchard (Figure 1) and retained Envirocore, Plain City, Ohio to conduct environmental drilling to collect the samples. Prior to the start of the sampling activities, Envirocore contacted the Ohio Utilities Protection Service to request that member utilities identify their underground utilities in the sampling area. POWER also retained The Underground Detective, Toledo, Ohio, to conduct electromagnetic and ground penetrating radar surveys in the vicinity of the 12 proposed soil sampling locations. No underground utilities were identified in the immediate vicinity of proposed sampling locations by Ohio Utilities Protection Service member utilities or by The Underground Detective.

Sample Collection and Analysis

Soil samples were collected at the locations shown in Figure 1 on October 18, 2021. At each location, Envirocore operated a hydraulic direct-push drill rig to collect soil cores continuously from ground surface to a depth of eight feet below ground surface. A POWER environmental scientist collected samples in two-foot intervals (0 to 2 feet; 2 to 4 feet; 4 to 6 feet; and 6 to 8 feet below ground surface) at each sampling location. The upper interval plus one or two deeper samples at each sampling location were selected for laboratory analysis.

Selected soil samples were submitted to Pace Analytical, Indianapolis, Indiana for analysis for the eight RCRA metals. The Pace Analytical laboratory report is provided as Attachment A.

Analytical results for the 30 selected soil samples are summarized in Table 1. This table lists only those metals that were detected in one or more samples. As shown in this table, the metals arsenic, barium, chromium, and lead were identified in all 30 soil samples while cadmium was detected in one soil sample. The metals mercury, selenium, and silver were not detected in any samples. While all of these metals are naturally occurring, it is POWER's experience that mercury, selenium, and silver are frequently not present in Ohio soils at concentrations detected in laboratory analysis.

As shown in Table 1, arsenic was identified in all 30 samples at concentrations from 2.0 to 16.2 milligrams per kilogram (mg/kg, or parts per million, ppm). Barium was detected in all 30 samples at concentrations from 14.6 ppm to 78.4 ppm, while chromium was identified in all samples at concentrations from 4.0 to 21.6 ppm. Lead was detected in all samples at concentrations ranging from 3.1 to 29.8 ppm.

Evaluation of Analytical Results

The scope of work for this investigation included evaluation of analytical results in the context of construction worker health and safety requirements as well as for waste management concerns. The results of these evaluations are presented below.

Construction Worker Health and Safety

Table 1 includes regulatory standards from the Ohio Voluntary Action Program (VAP) as well as anticipated background concentrations for the detected metals.

- The VAP is a program that allows property owners to voluntarily investigate and, if necessary, remediate eligible properties in exchange for environmental liability release from the Ohio Environmental Protection Agency. POWER has no information to indicate that remediation of the Survey Area is necessary and this sampling and analysis was not conducted as part of a VAP investigation; nonetheless, the VAP program includes generic (not site-specific) risk-based soil standards that are useful in evaluating the results from this investigation. The VAP risk-based standards for construction activities and commercial and industrial land use are included in Table 1. VAP standards are codified at Ohio Administrative Code 3745-300-08.
- Anticipated background concentration ranges for the detected metals are from Evaluation of Background Metal Concentration in Ohio Soils (Cox and Colvin, 1996).

Conclusions for comparison of analytical results to VAP standards and anticipated background concentrations are summarized below:

- Arsenic was identified at a maximum concentration of 16.2 ppm, well below the VAP construction activities standard of 760 ppm and the VAP commercial / industrial land use standard of 100 ppm. This maximum concentration is in the anticipated background range of 0.5 to 56 ppm. Based on this information, it does not appear that soils of the Survey Area have been impacted with arsenic from the historic orchard activities.
- Lead was identified at a maximum concentration of 29.8 ppm, well below the 400 ppm (construction) and 800 ppm (commercial and industrial) VAP standard. The maximum detected concentration is in the anticipated background range of 1.0 to 147 ppm. Based on these results, lead concentrations in soils of the Survey Area are consistent with background concentrations and do not appear to have been adversely impacted by past orchard activities.
- Barium was identified at a maximum concentration of 78.4 ppm, well below the VAP standards of 350,000 ppm (construction) and 760,000 (commercial / industrial land use) and in the anticipated background range of 9.3 to 323 ppm.
- Cadmium was identified in one sample from the Survey Area at a concentration of 0.72 ppm, well below VAP standards of 710 ppm (construction) and 3,300 ppm (commercial and industrial land use). This detected concentration is in the anticipated background range of 0.07 to 4.4 ppm.
- The maximum chromium detection of 21.6 ppm is well below the VAP standards for construction activities (1,300 ppm) and commercial and industrial land use (240 ppm) and is in the anticipated background concentration range of 2.0 to 80.5 ppm.

Based on these results, concentrations of the detected metals in soils of the Survey Area appear to be consistent with anticipated background concentrations. Soils of the Survey Area do not appear to be impacted with metals as a result of historic orchard activities, and special construction worker health and safety provisions for metals in soils are not required.

Waste Management

The scope of work for this investigation included analysis of up to three soil samples for metals to evaluate potential waste management concerns associated with off-site disposal of soil, if required during construction of the project.

The waste management evaluation was based on federal and state of Ohio hazardous waste regulations that identify a waste material as hazardous if it is a listed waste or has the characteristic of toxicity. Listed wastes are specific chemicals or wastes generated by specified industrial processes; POWER is not aware of any listed wastes in soils of the Survey Area. Waste with the characteristic of toxicity are those that are tested by the Toxicity Characteristic Leaching Procedure (TCLP) and found to leach concentrations of TCLP-regulated chemicals above regulatory limits. TCLP regulatory limits have been established for arsenic, barium, cadmium, chromium, and lead, the five metals detected in samples collected during this investigation. However, POWER's review of the soil sample metals results as described above indicated that none of the soil samples could exhibit the characteristic of toxicity for any of the detected metals; therefore, TCLP testing was not conducted. This evaluation is described below.

The TCLP procedure for soil samples involves mixing a soil sample with a mass of TCLP extract solvent equal to 20 times the mass of the soil sample. After mixing for the specified period of time, the TCLP extract solution is analyzed for chemical constituents of concern. If all of the chemical constituent in the soil sample leaches into the TCLP extract solvent, the concentration of that chemical in the TCLP extract solvent will be 5% of the concentration in the soil sample. Therefore, as long as the concentrations of the metals detected in samples from this investigation are less than 5% (1/20) of the TCLP regulatory limit, the soil samples cannot exceed the regulatory limit when tested by the TCLP procedure. None of the detected metals were present at a concentration in soil equal to or greater than 5% of their TCLP regulatory limit.

- The TCLP regulatory limit for arsenic is 5 ppm. Evaluation of this result in light of the 20-fold dilution of the TCLP method as described above indicates that a soil sample with less than 100 ppm of arsenic cannot exceed the TCLP regulatory limit. The maximum arsenic concentration in soil samples from this investigation was 16.2 ppm, well below 100 ppm.
- The maximum detected barium concentration in a sample from this investigation was 78.4 ppm, well less than 1/20 of the TCLP regulatory limit of 100 ppm for barium.
- The maximum identified concentration of cadmium was 0.72 ppm, well less than 5% of the TCLP regulatory limit of 1 ppm.
- The TCLP regulatory limit for chromium is 5 ppm, indicating that soil sample with a concentration of 100 ppm or above could result in a TCLP method result above the regulatory limit. However, the maximum detected chromium concentration in soil samples from this investigation was 21.6 ppm, well below 100 ppm.
- The TCLP regulatory limit for lead is 5 parts per million (ppm); therefore, a soil sample with a concentration of lead equal to or greater than 100 ppm could exceed the 5 ppm regulatory limit when tested by the TCLP method. The maximum lead concentration in soil samples from this investigation was 29.8 ppm, well below 100 ppm.

Based on the 20-fold dilution evaluation described above, none of the soil samples from this investigation could exceed a TCLP regulatory limit for the detected metals. None of the soil samples from this investigation would therefore be deemed hazardous waste for purposes of off-site disposal, if needed during construction.

CONCLUSIONS

This investigation consisted of collection of soil samples from the Survey Area followed by analysis for metal constituents of concern based on the past use of the eastern portion of the Survey Area as a fruit orchard.

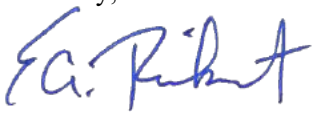
Analytical results were compared to applicable regulatory standards as well as anticipated background concentrations. Elevated concentration of metals of concern were not identified in any soil samples. Therefore, special construction worker health and safety measures to prevent exposure to metals in soil do not appear to be necessary.

Analytical results for metals were also evaluated for potential waste disposal concerns, in the event that excavated soils generated during construction must be taken off-site for disposal. None of the soil samples contained concentrations of metals that would lead to characterization of the soil as a hazardous waste. Local disposal facilities may have other routine testing requirements, but additional testing for metals does not appear to be needed.

No other environmental contaminant concerns were noted in the Phase I ESA report for the Survey Area. Therefore, POWER does not recommend additional soil sample collection and analysis at this time.

Thank you for the opportunity to provide environmental services in support of the Amherst #2 project. If you have questions about this investigation or would like more information, please contact me at 513-326-1525 or by email at eric.riekert@powereng.com.

Sincerely,



Eric A. Riekert
Department Manager – Site Assessment, Remediation and Compliance

c: Jennifer Nietz, POWER

Figure 1. Soil Sampling Locations, Amherst #2 Soil Sampling and Analysis Investigation

Survey Area
Right-of-way (100')
Proposed Pole Location
Soil Sampling Location (SB-1)
Geotechnical Bore Location
Proposed Substation Expansion Area
Existing Amherst #2 Substation
City of Amherst Owned Parcels
Parcel Boundary
Road
Railroad
Existing 138 kV Transmission Line
Temporary Access Road
Temporary Access Path *Approximate access path is shown, actual access path will be determined on site

Figure 1: Soil Sampling Locations
Lorain County, Ohio

0 250
Feet

1" = 250'
Map 1 of 1

Amherst #2
Substation Expansion and
138 kV Transmission Line Project

POWER ENGINEERS
AMP TRANSMISSION

Date: 11/16/2021

Table 1. Analytical Results for Soil Samples, Amherst #2 Soil Sampling and Analysis Investigation

Table 1. Analytical Results for Soil Samples
Amherst #2 Soil Sampling and Analysis Investigation

	Analytical Result				
Sample ID	**Arsenic**	**Barium**	**Cadmium**	**Chromium**	**Lead**
SB1 0-2	8.6	22.4	ND	6.2	21.7
SB1 2-4	12.5	78.4	0.72	9.9	8.7
SB1 6-8	15.8	40.5	ND	20	9.5
SB10 0-2	4.9	20.2	ND	6.4	7.4
SB10 6-8	6.8	15.9	ND	7.0	6.4
SB11 0-2	4.3	20.9	ND	5.7	7.7
SB11 2-4	3.3	15.8	ND	5.3	3.1
SB11 6-8	11.3	54.6	ND	21.6	12.8
SB12 0-2	7.2	19.2	ND	9	5.3
SB12 2-4	4.3	20.5	ND	6.2	6.8
SB2 0-2	9.7	78.1	ND	10	6.9
SB2 4-6	4.4	19.2	ND	16.3	3.4
SB3 0-2	11.6	42.4	ND	9.6	29.8
SB3 2-4	5.1	53.6	ND	10.2	7.9
SB3 6-8	10.2	58.9	ND	17.8	11.3
SB4 0-2	3.5	27.2	ND	4.9	10.3
SB4 2-4	15.8	26.4	ND	10.8	8.1
SB5 0-2	5.2	19.2	ND	7.5	8.7
SB5 2-4	14.4	34.9	ND	16.5	14.9
SB5 6-8	3.4	15.0	ND	15	3.2
SB6 0-2	8.6	43.9	ND	7.0	23.6
SB6 2-4	5.9	31.5	ND	9.6	6.2
SB7 0-2	4.9	27.8	ND	6.5	9.9
SB7 2-4	5.5	16.4	ND	6.3	5.0
SB7 6-8	16.2	39.6	ND	8.6	4.9
SB8 0-2	5.6	22.3	ND	6.2	19.1
SB8 6-8	5.8	15.6	ND	8.8	4.6
SB9 0-2	5.8	21.1	ND	5.2	12.2
SB9 2-4	2.0	14.6	ND	4.0	3.4
SB9 4-6	4.9	19.4	ND	8.8	4.1
Ohio EPA VAP Program Standards					
Construction Activities	760	350,000	710	1300	400
Commercial or Industrial Land Use	100	760,000	3,300	240	800
Anticipated Background					
Range	0.5 to 56	9.3 to 323	0.07 to 4.4	2.0 to 80.5	1.0 to 147
Median	5.8	63.2	0.48	12	14.3

Notes:
1. All results are in units of milligrams per kilogram (mg/kg) or parts per million, ppm
2. Ohio EPA Vap Standards are codified at Ohio Administrative Code 3745-300-08
3. Anticipated background concentrations are from Evaluation of Background Metal Concentrations in Ohio Soils (Cox and Colvin, 1996)
4. ND: non-detect. The metal was not detected in the sample at the laboratory reporting limit.

Attachment A. Analytical Laboratory Report

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

November 04, 2021

Eric Riekert
POWER Engineers
11733 Chesterdale Rd.
Cincinnati, OH 45246

RE: Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Dear Eric Riekert:

Enclosed are the analytical results for sample(s) received by the laboratory on October 22, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Indianapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Tina Sayer

Tina Sayer
tina.sayer@pacelabs.com
(317)228-3100
Project Manager

Enclosures

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

CERTIFICATIONS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Pace Analytical Services Indianapolis

7726 Moller Road, Indianapolis, IN 46268
Illinois Accreditation #: 200074
Indiana Drinking Water Laboratory #: C-49-06
Kansas/TNI Certification #: E-10177
Kentucky UST Agency Interest #: 80226
Kentucky WW Laboratory ID #: 98019
Michigan Drinking Water Laboratory #9050
Ohio VAP Certified Laboratory #: CL0065
Oklahoma Laboratory #: 9204
Texas Certification #: T104704355
Wisconsin Laboratory #: 999788130
USDA Soil Permit #: P330-19-00257

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

SAMPLE SUMMARY

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50300913001	**SB1 0-2**	Solid	10/18/21 12:40	10/22/21 09:20
50300913002	**SB1 2-4**	Solid	10/18/21 12:40	10/22/21 09:20
50300913003	**SB1 6-8**	Solid	10/18/21 12:40	10/22/21 09:20
50300913004	**SB2 0-2**	Solid	10/18/21 12:27	10/22/21 09:20
50300913005	**SB2 4-6**	Solid	10/18/21 12:27	10/22/21 09:20
50300913006	**SB3 0-2**	Solid	10/18/21 12:57	10/22/21 09:20
50300913007	**SB3 2-4**	Solid	10/18/21 12:57	10/22/21 09:20
50300913008	**SB3 6-8**	Solid	10/18/21 12:57	10/22/21 09:20
50300913009	**SB4 0-2**	Solid	10/18/21 13:09	10/22/21 09:20
50300913010	**SB4 2-4**	Solid	10/18/21 13:09	10/22/21 09:20
50300913011	**SB5 0-2**	Solid	10/18/21 13:20	10/22/21 09:20
50300913012	**SB5 2-4**	Solid	10/18/21 13:20	10/22/21 09:20
50300913013	**SB5 6-8**	Solid	10/18/21 13:20	10/22/21 09:20
50300913014	**SB6 0-2**	Solid	10/18/21 13:41	10/22/21 09:20
50300913015	**SB6 2-4**	Solid	10/18/21 13:41	10/22/21 09:20
50300913016	**SB7 0-2**	Solid	10/18/21 13:50	10/22/21 09:20
50300913017	**SB7 2-4**	Solid	10/18/21 13:50	10/22/21 09:20
50300913018	**SB7 6-8**	Solid	10/18/21 13:50	10/22/21 09:20
50300913019	**SB8 0-2**	Solid	10/18/21 14:01	10/22/21 09:20
50300913020	**SB8 6-8**	Solid	10/18/21 14:01	10/22/21 09:20
50300913021	**SB9 0-2**	Solid	10/18/21 14:09	10/22/21 09:20
50300913022	**SB9 2-4**	Solid	10/18/21 14:09	10/22/21 09:20
50300913023	**SB9 4-6**	Solid	10/18/21 14:09	10/22/21 09:20
50300913024	**SB10 0-2**	Solid	10/18/21 14:20	10/22/21 09:20
50300913025	**SB10 6-8**	Solid	10/18/21 14:20	10/22/21 09:20
50300913026	**SB11 0-2**	Solid	10/18/21 14:29	10/22/21 09:20
50300913027	**SB11 2-4**	Solid	10/18/21 14:29	10/22/21 09:20
50300913028	**SB11 6-8**	Solid	10/18/21 14:29	10/22/21 09:20
50300913029	**SB12 0-2**	Solid	10/18/21 14:41	10/22/21 09:20
50300913030	**SB12 2-4**	Solid	10/18/21 14:41	10/22/21 09:20

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

SAMPLE ANALYTE COUNT

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50300913001	**SB1 0-2**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913002	**SB1 2-4**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913003	**SB1 6-8**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913004	**SB2 0-2**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913005	**SB2 4-6**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913006	**SB3 0-2**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913007	**SB3 2-4**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913008	**SB3 6-8**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913009	**SB4 0-2**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913010	**SB4 2-4**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913011	**SB5 0-2**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913012	**SB5 2-4**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913013	**SB5 6-8**	EPA 6010	RAM	7	PASI-I

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913014	**SB6 0-2**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913015	**SB6 2-4**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913016	**SB7 0-2**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913017	**SB7 2-4**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913018	**SB7 6-8**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913019	**SB8 0-2**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913020	**SB8 6-8**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913021	**SB9 0-2**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913022	**SB9 2-4**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913023	**SB9 4-6**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913024	**SB10 0-2**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913025	**SB10 6-8**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I

Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

SAMPLE ANALYTE COUNT

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2540G	ADT	1	PASI-I
50300913026	**SB11 0-2**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913027	**SB11 2-4**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913028	**SB11 6-8**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913029	**SB12 0-2**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I
50300913030	**SB12 2-4**	EPA 6010	RAM	7	PASI-I
		EPA 7471	ILP	1	PASI-I
		SM 2540G	ADT	1	PASI-I

PASI-I = Pace Analytical Services - Indianapolis

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

SUMMARY OF DETECTION

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50300913001	**SB1 0-2**					
EPA 6010	Arsenic	8.6	mg/kg	1.1	11/03/21 15:23	
EPA 6010	Barium	22.4	mg/kg	1.1	11/03/21 15:23	
EPA 6010	Chromium	6.2	mg/kg	1.1	11/03/21 15:23	
EPA 6010	Lead	21.7	mg/kg	1.1	11/03/21 15:23	
SM 2540G	Percent Moisture	11.7	%	0.10	10/25/21 11:52	N2
50300913002	**SB1 2-4**					
EPA 6010	Arsenic	12.5	mg/kg	1.0	11/03/21 15:25	
EPA 6010	Barium	78.4	mg/kg	1.0	11/03/21 15:25	
EPA 6010	Cadmium	0.72	mg/kg	0.51	11/03/21 15:25	
EPA 6010	Chromium	9.9	mg/kg	1.0	11/03/21 15:25	
EPA 6010	Lead	8.7	mg/kg	1.0	11/03/21 15:25	
SM 2540G	Percent Moisture	14.0	%	0.10	10/25/21 11:54	N2
50300913003	**SB1 6-8**					
EPA 6010	Arsenic	15.8	mg/kg	1.1	11/03/21 15:27	
EPA 6010	Barium	40.5	mg/kg	1.1	11/03/21 15:27	
EPA 6010	Chromium	20.0	mg/kg	1.1	11/03/21 15:27	
EPA 6010	Lead	9.5	mg/kg	1.1	11/03/21 15:27	
SM 2540G	Percent Moisture	12.8	%	0.10	10/25/21 11:54	N2
50300913004	**SB2 0-2**					
EPA 6010	Arsenic	9.7	mg/kg	1.0	11/03/21 15:43	
EPA 6010	Barium	78.1	mg/kg	1.0	11/03/21 15:43	
EPA 6010	Chromium	10.0	mg/kg	1.0	11/03/21 15:43	
EPA 6010	Lead	6.9	mg/kg	1.0	11/03/21 15:43	
SM 2540G	Percent Moisture	14.7	%	0.10	10/25/21 11:55	N2
50300913005	**SB2 4-6**					
EPA 6010	Arsenic	4.4	mg/kg	0.91	11/03/21 15:45	
EPA 6010	Barium	19.2	mg/kg	0.91	11/03/21 15:45	
EPA 6010	Chromium	16.3	mg/kg	0.91	11/03/21 15:45	
EPA 6010	Lead	3.4	mg/kg	0.91	11/03/21 15:45	
SM 2540G	Percent Moisture	6.6	%	0.10	10/25/21 11:55	N2
50300913006	**SB3 0-2**					
EPA 6010	Arsenic	11.6	mg/kg	1.1	11/03/21 15:47	
EPA 6010	Barium	42.4	mg/kg	1.1	11/03/21 15:47	
EPA 6010	Chromium	9.6	mg/kg	1.1	11/03/21 15:47	
EPA 6010	Lead	29.8	mg/kg	1.1	11/03/21 15:47	
SM 2540G	Percent Moisture	13.8	%	0.10	10/25/21 11:55	N2
50300913007	**SB3 2-4**					
EPA 6010	Arsenic	5.1	mg/kg	1.1	11/03/21 15:49	
EPA 6010	Barium	53.6	mg/kg	1.1	11/03/21 15:49	
EPA 6010	Chromium	10.2	mg/kg	1.1	11/03/21 15:49	
EPA 6010	Lead	7.9	mg/kg	1.1	11/03/21 15:49	
SM 2540G	Percent Moisture	20.2	%	0.10	10/25/21 11:55	N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

SUMMARY OF DETECTION

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50300913008	**SB3 6-8**					
EPA 6010	Arsenic	10.2	mg/kg	1.1	11/03/21 15:51	
EPA 6010	Barium	58.9	mg/kg	1.1	11/03/21 15:51	
EPA 6010	Chromium	17.8	mg/kg	1.1	11/03/21 15:51	
EPA 6010	Lead	11.3	mg/kg	1.1	11/03/21 15:51	
SM 2540G	Percent Moisture	19.9	%	0.10	10/25/21 11:55	N2
50300913009	**SB4 0-2**					
EPA 6010	Arsenic	3.5	mg/kg	0.97	11/03/21 15:53	
EPA 6010	Barium	27.2	mg/kg	0.97	11/03/21 15:53	
EPA 6010	Chromium	4.9	mg/kg	0.97	11/03/21 15:53	
EPA 6010	Lead	10.3	mg/kg	0.97	11/03/21 15:53	
SM 2540G	Percent Moisture	10	%	0.10	10/25/21 11:55	N2
50300913010	**SB4 2-4**					
EPA 6010	Arsenic	15.8	mg/kg	0.94	11/03/21 15:59	
EPA 6010	Barium	26.4	mg/kg	0.94	11/03/21 15:59	
EPA 6010	Chromium	10.8	mg/kg	0.94	11/03/21 15:59	
EPA 6010	Lead	8.1	mg/kg	0.94	11/03/21 15:59	
SM 2540G	Percent Moisture	8.6	%	0.10	10/25/21 11:56	N2
50300913011	**SB5 0-2**					
EPA 6010	Arsenic	5.2	mg/kg	1.1	11/03/21 16:01	
EPA 6010	Barium	19.2	mg/kg	1.1	11/03/21 16:01	
EPA 6010	Chromium	7.5	mg/kg	1.1	11/03/21 16:01	
EPA 6010	Lead	8.7	mg/kg	1.1	11/03/21 16:01	
SM 2540G	Percent Moisture	15.3	%	0.10	10/25/21 11:56	N2
50300913012	**SB5 2-4**					
EPA 6010	Arsenic	14.4	mg/kg	1.1	11/03/21 16:03	
EPA 6010	Barium	34.9	mg/kg	1.1	11/03/21 16:03	
EPA 6010	Chromium	16.5	mg/kg	1.1	11/03/21 16:03	
EPA 6010	Lead	14.9	mg/kg	1.1	11/03/21 16:03	
SM 2540G	Percent Moisture	19.9	%	0.10	10/25/21 11:56	N2
50300913013	**SB5 6-8**					
EPA 6010	Arsenic	3.4	mg/kg	1.0	11/03/21 16:05	
EPA 6010	Barium	15.0	mg/kg	1.0	11/03/21 16:05	
EPA 6010	Chromium	15.0	mg/kg	1.0	11/03/21 16:05	
EPA 6010	Lead	3.2	mg/kg	1.0	11/03/21 16:05	
SM 2540G	Percent Moisture	7.6	%	0.10	10/25/21 11:56	N2
50300913014	**SB6 0-2**					
EPA 6010	Arsenic	8.6	mg/kg	1.1	11/03/21 16:07	
EPA 6010	Barium	43.9	mg/kg	1.1	11/03/21 16:07	
EPA 6010	Chromium	7.0	mg/kg	1.1	11/03/21 16:07	
EPA 6010	Lead	23.6	mg/kg	1.1	11/03/21 16:07	
SM 2540G	Percent Moisture	19.3	%	0.10	10/25/21 11:56	N2
50300913015	**SB6 2-4**					
EPA 6010	Arsenic	5.9	mg/kg	1.1	11/03/21 16:09	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

SUMMARY OF DETECTION

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50300913015	**SB6 2-4**					
EPA 6010	Barium	31.5	mg/kg	1.1	11/03/21 16:09	
EPA 6010	Chromium	9.6	mg/kg	1.1	11/03/21 16:09	
EPA 6010	Lead	6.2	mg/kg	1.1	11/03/21 16:09	
SM 2540G	Percent Moisture	11.6	%	0.10	10/25/21 11:57	N2
50300913016	**SB7 0-2**					
EPA 6010	Arsenic	4.9	mg/kg	1.1	11/03/21 16:11	
EPA 6010	Barium	27.8	mg/kg	1.1	11/03/21 16:11	
EPA 6010	Chromium	6.5	mg/kg	1.1	11/03/21 16:11	
EPA 6010	Lead	9.9	mg/kg	1.1	11/03/21 16:11	
SM 2540G	Percent Moisture	19.9	%	0.10	10/25/21 11:57	N2
50300913017	**SB7 2-4**					
EPA 6010	Arsenic	5.5	mg/kg	1.0	11/03/21 16:13	
EPA 6010	Barium	16.4	mg/kg	1.0	11/03/21 16:13	
EPA 6010	Chromium	6.3	mg/kg	1.0	11/03/21 16:13	
EPA 6010	Lead	5.0	mg/kg	1.0	11/03/21 16:13	
SM 2540G	Percent Moisture	6.3	%	0.10	10/25/21 11:57	N2
50300913018	**SB7 6-8**					
EPA 6010	Arsenic	16.2	mg/kg	1.1	11/03/21 16:15	
EPA 6010	Barium	39.6	mg/kg	1.1	11/03/21 16:15	
EPA 6010	Chromium	8.6	mg/kg	1.1	11/03/21 16:15	
EPA 6010	Lead	4.9	mg/kg	1.1	11/03/21 16:15	
SM 2540G	Percent Moisture	11.2	%	0.10	10/25/21 11:58	N2
50300913019	**SB8 0-2**					
EPA 6010	Arsenic	5.6	mg/kg	1.1	11/03/21 16:17	
EPA 6010	Barium	22.3	mg/kg	1.1	11/03/21 16:17	
EPA 6010	Chromium	6.2	mg/kg	1.1	11/03/21 16:17	
EPA 6010	Lead	19.1	mg/kg	1.1	11/03/21 16:17	
SM 2540G	Percent Moisture	16.5	%	0.10	10/25/21 11:58	N2
50300913020	**SB8 6-8**					
EPA 6010	Arsenic	5.8	mg/kg	1.1	11/03/21 16:23	
EPA 6010	Barium	15.6	mg/kg	1.1	11/03/21 16:23	
EPA 6010	Chromium	8.8	mg/kg	1.1	11/03/21 16:23	
EPA 6010	Lead	4.6	mg/kg	1.1	11/03/21 16:23	
SM 2540G	Percent Moisture	14.6	%	0.10	10/25/21 11:58	N2
50300913021	**SB9 0-2**					
EPA 6010	Arsenic	5.8	mg/kg	1.0	11/03/21 14:51	
EPA 6010	Barium	21.1	mg/kg	1.0	11/03/21 14:51	
EPA 6010	Chromium	5.2	mg/kg	1.0	11/03/21 14:51	
EPA 6010	Lead	12.2	mg/kg	1.0	11/03/21 14:51	
SM 2540G	Percent Moisture	9.2	%	0.10	10/25/21 11:58	N2
50300913022	**SB9 2-4**					
EPA 6010	Arsenic	2.0	mg/kg	0.92	11/03/21 14:53	
EPA 6010	Barium	14.6	mg/kg	0.92	11/03/21 14:53	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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SUMMARY OF DETECTION

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50300913022	**SB9 2-4**					
EPA 6010	Chromium	4.0	mg/kg	0.92	11/03/21 14:53	
EPA 6010	Lead	3.4	mg/kg	0.92	11/03/21 14:53	
SM 2540G	Percent Moisture	4.8	%	0.10	10/25/21 12:10	N2
50300913023	**SB9 4-6**					
EPA 6010	Arsenic	4.9	mg/kg	0.92	11/03/21 14:55	
EPA 6010	Barium	19.4	mg/kg	0.92	11/03/21 14:55	
EPA 6010	Chromium	8.8	mg/kg	0.92	11/03/21 14:55	
EPA 6010	Lead	4.1	mg/kg	0.92	11/03/21 14:55	
SM 2540G	Percent Moisture	8.1	%	0.10	10/25/21 12:10	N2
50300913024	**SB10 0-2**					
EPA 6010	Arsenic	4.9	mg/kg	1.1	11/03/21 14:57	
EPA 6010	Barium	20.2	mg/kg	1.1	11/03/21 14:57	
EPA 6010	Chromium	6.4	mg/kg	1.1	11/03/21 14:57	
EPA 6010	Lead	7.4	mg/kg	1.1	11/03/21 14:57	
SM 2540G	Percent Moisture	15.1	%	0.10	10/25/21 12:10	N2
50300913025	**SB10 6-8**					
EPA 6010	Arsenic	6.8	mg/kg	1.1	11/03/21 14:59	
EPA 6010	Barium	15.9	mg/kg	1.1	11/03/21 14:59	
EPA 6010	Chromium	7.0	mg/kg	1.1	11/03/21 14:59	
EPA 6010	Lead	6.4	mg/kg	1.1	11/03/21 14:59	
SM 2540G	Percent Moisture	13.5	%	0.10	10/25/21 12:10	N2
50300913026	**SB11 0-2**					
EPA 6010	Arsenic	4.3	mg/kg	1.0	11/03/21 15:01	
EPA 6010	Barium	20.9	mg/kg	1.0	11/03/21 15:01	
EPA 6010	Chromium	5.7	mg/kg	1.0	11/03/21 15:01	
EPA 6010	Lead	7.7	mg/kg	1.0	11/03/21 15:01	
SM 2540G	Percent Moisture	14.9	%	0.10	10/25/21 12:10	N2
50300913027	**SB11 2-4**					
EPA 6010	Arsenic	3.3	mg/kg	1.0	11/03/21 15:03	
EPA 6010	Barium	15.8	mg/kg	1.0	11/03/21 15:03	
EPA 6010	Chromium	5.3	mg/kg	1.0	11/03/21 15:03	
EPA 6010	Lead	3.1	mg/kg	1.0	11/03/21 15:03	
SM 2540G	Percent Moisture	14.1	%	0.10	10/25/21 12:10	N2
50300913028	**SB11 6-8**					
EPA 6010	Arsenic	11.3	mg/kg	1.0	11/03/21 15:05	
EPA 6010	Barium	54.6	mg/kg	1.0	11/03/21 15:05	
EPA 6010	Chromium	21.6	mg/kg	1.0	11/03/21 15:05	
EPA 6010	Lead	12.8	mg/kg	1.0	11/03/21 15:05	
SM 2540G	Percent Moisture	17.9	%	0.10	10/25/21 12:11	N2
50300913029	**SB12 0-2**					
EPA 6010	Arsenic	7.2	mg/kg	1.0	11/03/21 15:11	
EPA 6010	Barium	19.2	mg/kg	1.0	11/03/21 15:11	
EPA 6010	Chromium	9.0	mg/kg	1.0	11/03/21 15:11	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

SUMMARY OF DETECTION

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50300913029	**SB12 0-2**					
EPA 6010	Lead	5.3	mg/kg	1.0	11/03/21 15:11	
SM 2540G	Percent Moisture	11.0	%	0.10	10/25/21 12:11	N2
50300913030	**SB12 2-4**					
EPA 6010	Arsenic	4.3	mg/kg	1.1	11/03/21 15:13	
EPA 6010	Barium	20.5	mg/kg	1.1	11/03/21 15:13	
EPA 6010	Chromium	6.2	mg/kg	1.1	11/03/21 15:13	
EPA 6010	Lead	6.8	mg/kg	1.1	11/03/21 15:13	
SM 2540G	Percent Moisture	15.6	%	0.10	10/25/21 12:11	N2

REPORT OF LABORATORY ANALYSIS

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(317)228-3100

ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB1 0-2 **Lab ID: 50300913001** Collected: 10/18/21 12:40 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**8.6**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:23	7440-38-2	
Barium	**22.4**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:23	7440-39-3	
Cadmium	ND	mg/kg	0.53	1	11/03/21 06:50	11/03/21 15:23	7440-43-9	
Chromium	**6.2**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:23	7440-47-3	
Lead	**21.7**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:23	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:23	7782-49-2	
Silver	ND	mg/kg	0.53	1	11/03/21 06:50	11/03/21 15:23	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.22	1	10/31/21 13:27	11/01/21 08:32	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**11.7**	%	0.10	1		10/25/21 11:52		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(317)228-3100

ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB1 2-4 **Lab ID: 50300913002** Collected: 10/18/21 12:40 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**12.5**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:25	7440-38-2	
Barium	**78.4**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:25	7440-39-3	
Cadmium	**0.72**	mg/kg	0.51	1	11/03/21 06:50	11/03/21 15:25	7440-43-9	
Chromium	**9.9**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:25	7440-47-3	
Lead	**8.7**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:25	7439-92-1	
Selenium	ND	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:25	7782-49-2	
Silver	ND	mg/kg	0.51	1	11/03/21 06:50	11/03/21 15:25	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.23	1	10/31/21 13:27	11/01/21 08:39	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**14.0**	%	0.10	1		10/25/21 11:54		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB1 6-8 **Lab ID: 50300913003** Collected: 10/18/21 12:40 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**15.8**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:27	7440-38-2	
Barium	**40.5**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:27	7440-39-3	
Cadmium	ND	mg/kg	0.53	1	11/03/21 06:50	11/03/21 15:27	7440-43-9	
Chromium	**20.0**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:27	7440-47-3	
Lead	**9.5**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:27	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:27	7782-49-2	
Silver	ND	mg/kg	0.53	1	11/03/21 06:50	11/03/21 15:27	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.23	1	10/31/21 13:27	11/01/21 08:46	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**12.8**	%	0.10	1		10/25/21 11:54		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB2 0-2 **Lab ID: 50300913004** Collected: 10/18/21 12:27 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**9.7**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:43	7440-38-2	
Barium	**78.1**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:43	7440-39-3	
Cadmium	ND	mg/kg	0.50	1	11/03/21 06:50	11/03/21 15:43	7440-43-9	
Chromium	**10.0**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:43	7440-47-3	
Lead	**6.9**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:43	7439-92-1	
Selenium	ND	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:43	7782-49-2	
Silver	ND	mg/kg	0.50	1	11/03/21 06:50	11/03/21 15:43	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.24	1	10/31/21 13:27	11/01/21 08:49	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**14.7**	%	0.10	1		10/25/21 11:55		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB2 4-6 **Lab ID: 50300913005** Collected: 10/18/21 12:27 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**4.4**	mg/kg	0.91	1	11/03/21 06:50	11/03/21 15:45	7440-38-2	
Barium	**19.2**	mg/kg	0.91	1	11/03/21 06:50	11/03/21 15:45	7440-39-3	
Cadmium	ND	mg/kg	0.46	1	11/03/21 06:50	11/03/21 15:45	7440-43-9	
Chromium	**16.3**	mg/kg	0.91	1	11/03/21 06:50	11/03/21 15:45	7440-47-3	
Lead	**3.4**	mg/kg	0.91	1	11/03/21 06:50	11/03/21 15:45	7439-92-1	
Selenium	ND	mg/kg	1.8	2	11/03/21 06:50	11/03/21 16:27	7782-49-2	D3
Silver	ND	mg/kg	0.46	1	11/03/21 06:50	11/03/21 15:45	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.21	1	10/31/21 13:27	11/01/21 08:51	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**6.6**	%	0.10	1		10/25/21 11:55		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB3 0-2 **Lab ID: 50300913006** Collected: 10/18/21 12:57 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**11.6**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:47	7440-38-2	
Barium	**42.4**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:47	7440-39-3	
Cadmium	ND	mg/kg	0.56	1	11/03/21 06:50	11/03/21 15:47	7440-43-9	
Chromium	**9.6**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:47	7440-47-3	
Lead	**29.8**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:47	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:47	7782-49-2	
Silver	ND	mg/kg	0.56	1	11/03/21 06:50	11/03/21 15:47	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.23	1	10/31/21 13:27	11/01/21 08:54	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**13.8**	%	0.10	1		10/25/21 11:55		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB3 2-4 **Lab ID: 50300913007** Collected: 10/18/21 12:57 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**5.1**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:49	7440-38-2	
Barium	**53.6**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:49	7440-39-3	
Cadmium	ND	mg/kg	0.56	1	11/03/21 06:50	11/03/21 15:49	7440-43-9	
Chromium	**10.2**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:49	7440-47-3	
Lead	**7.9**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:49	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:49	7782-49-2	
Silver	ND	mg/kg	0.56	1	11/03/21 06:50	11/03/21 15:49	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.24	1	10/31/21 13:27	11/01/21 08:56	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**20.2**	%	0.10	1		10/25/21 11:55		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB3 6-8 **Lab ID: 50300913008** Collected: 10/18/21 12:57 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**10.2**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:51	7440-38-2	
Barium	**58.9**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:51	7440-39-3	
Cadmium	ND	mg/kg	0.57	1	11/03/21 06:50	11/03/21 15:51	7440-43-9	
Chromium	**17.8**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:51	7440-47-3	
Lead	**11.3**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:51	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:51	7782-49-2	
Silver	ND	mg/kg	0.57	1	11/03/21 06:50	11/03/21 15:51	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.25	1	10/31/21 13:27	11/01/21 08:59	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**19.9**	%	0.10	1		10/25/21 11:55		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB4 0-2 **Lab ID: 50300913009** Collected: 10/18/21 13:09 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**3.5**	mg/kg	0.97	1	11/03/21 06:50	11/03/21 15:53	7440-38-2	
Barium	**27.2**	mg/kg	0.97	1	11/03/21 06:50	11/03/21 15:53	7440-39-3	
Cadmium	ND	mg/kg	0.48	1	11/03/21 06:50	11/03/21 15:53	7440-43-9	
Chromium	**4.9**	mg/kg	0.97	1	11/03/21 06:50	11/03/21 15:53	7440-47-3	
Lead	**10.3**	mg/kg	0.97	1	11/03/21 06:50	11/03/21 15:53	7439-92-1	
Selenium	ND	mg/kg	0.97	1	11/03/21 06:50	11/03/21 15:53	7782-49-2	
Silver	ND	mg/kg	0.48	1	11/03/21 06:50	11/03/21 15:53	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.23	1	10/31/21 13:27	11/01/21 09:01	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**10**	%	0.10	1		10/25/21 11:55		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB4 2-4 **Lab ID: 50300913010** Collected: 10/18/21 13:09 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**15.8**	mg/kg	0.94	1	11/03/21 06:50	11/03/21 15:59	7440-38-2	
Barium	**26.4**	mg/kg	0.94	1	11/03/21 06:50	11/03/21 15:59	7440-39-3	
Cadmium	ND	mg/kg	0.47	1	11/03/21 06:50	11/03/21 15:59	7440-43-9	
Chromium	**10.8**	mg/kg	0.94	1	11/03/21 06:50	11/03/21 15:59	7440-47-3	
Lead	**8.1**	mg/kg	0.94	1	11/03/21 06:50	11/03/21 15:59	7439-92-1	
Selenium	ND	mg/kg	0.94	1	11/03/21 06:50	11/03/21 15:59	7782-49-2	
Silver	ND	mg/kg	0.47	1	11/03/21 06:50	11/03/21 15:59	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.21	1	10/31/21 13:27	11/01/21 09:03	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**8.6**	%	0.10	1		10/25/21 11:56		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB5 0-2 **Lab ID: 50300913011** Collected: 10/18/21 13:20 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**5.2**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:01	7440-38-2	
Barium	**19.2**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:01	7440-39-3	
Cadmium	ND	mg/kg	0.53	1	11/03/21 06:50	11/03/21 16:01	7440-43-9	
Chromium	**7.5**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:01	7440-47-3	
Lead	**8.7**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:01	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:01	7782-49-2	
Silver	ND	mg/kg	0.53	1	11/03/21 06:50	11/03/21 16:01	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.24	1	10/31/21 13:27	11/01/21 09:06	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**15.3**	%	0.10	1		10/25/21 11:56		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB5 2-4 **Lab ID: 50300913012** Collected: 10/18/21 13:20 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**14.4**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:03	7440-38-2	
Barium	**34.9**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:03	7440-39-3	
Cadmium	ND	mg/kg	0.56	1	11/03/21 06:50	11/03/21 16:03	7440-43-9	
Chromium	**16.5**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:03	7440-47-3	
Lead	**14.9**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:03	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:03	7782-49-2	
Silver	ND	mg/kg	0.56	1	11/03/21 06:50	11/03/21 16:03	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.24	1	10/31/21 13:27	11/01/21 09:08	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**19.9**	%	0.10	1		10/25/21 11:56		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Indianapolis, IN 46268
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB5 6-8 **Lab ID: 50300913013** Collected: 10/18/21 13:20 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**3.4**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 16:05	7440-38-2	
Barium	**15.0**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 16:05	7440-39-3	
Cadmium	ND	mg/kg	0.52	1	11/03/21 06:50	11/03/21 16:05	7440-43-9	
Chromium	**15.0**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 16:05	7440-47-3	
Lead	**3.2**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 16:05	7439-92-1	
Selenium	ND	mg/kg	1.0	1	11/03/21 06:50	11/03/21 16:05	7782-49-2	
Silver	ND	mg/kg	0.52	1	11/03/21 06:50	11/03/21 16:05	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.22	1	10/31/21 13:27	11/01/21 09:18	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**7.6**	%	0.10	1		10/25/21 11:56		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB6 0-2 **Lab ID: 50300913014** Collected: 10/18/21 13:41 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**8.6**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:07	7440-38-2	
Barium	**43.9**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:07	7440-39-3	
Cadmium	ND	mg/kg	0.53	1	11/03/21 06:50	11/03/21 16:07	7440-43-9	
Chromium	**7.0**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:07	7440-47-3	
Lead	**23.6**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:07	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:07	7782-49-2	
Silver	ND	mg/kg	0.53	1	11/03/21 06:50	11/03/21 16:07	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.24	1	10/31/21 13:27	11/01/21 09:20	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**19.3**	%	0.10	1		10/25/21 11:56		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB6 2-4 **Lab ID: 50300913015** Collected: 10/18/21 13:41 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**5.9**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:09	7440-38-2	
Barium	**31.5**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:09	7440-39-3	
Cadmium	ND	mg/kg	0.55	1	11/03/21 06:50	11/03/21 16:09	7440-43-9	
Chromium	**9.6**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:09	7440-47-3	
Lead	**6.2**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:09	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:09	7782-49-2	
Silver	ND	mg/kg	0.55	1	11/03/21 06:50	11/03/21 16:09	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.22	1	10/31/21 13:27	11/01/21 09:23	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**11.6**	%	0.10	1		10/25/21 11:57		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB7 0-2 **Lab ID: 50300913016** Collected: 10/18/21 13:50 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**4.9**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:11	7440-38-2	
Barium	**27.8**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:11	7440-39-3	
Cadmium	ND	mg/kg	0.53	1	11/03/21 06:50	11/03/21 16:11	7440-43-9	
Chromium	**6.5**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:11	7440-47-3	
Lead	**9.9**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:11	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:11	7782-49-2	
Silver	ND	mg/kg	0.53	1	11/03/21 06:50	11/03/21 16:11	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.24	1	10/31/21 13:27	11/01/21 09:25	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**19.9**	%	0.10	1		10/25/21 11:57		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB7 2-4 **Lab ID: 50300913017** Collected: 10/18/21 13:50 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**5.5**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 16:13	7440-38-2	
Barium	**16.4**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 16:13	7440-39-3	
Cadmium	ND	mg/kg	0.52	1	11/03/21 06:50	11/03/21 16:13	7440-43-9	
Chromium	**6.3**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 16:13	7440-47-3	
Lead	**5.0**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 16:13	7439-92-1	
Selenium	ND	mg/kg	1.0	1	11/03/21 06:50	11/03/21 16:13	7782-49-2	
Silver	ND	mg/kg	0.52	1	11/03/21 06:50	11/03/21 16:13	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.22	1	10/31/21 13:27	11/01/21 09:28	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**6.3**	%	0.10	1		10/25/21 11:57		N2

REPORT OF LABORATORY ANALYSIS

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Indianapolis, IN 46268
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB7 6-8 **Lab ID: 50300913018** Collected: 10/18/21 13:50 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**16.2**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:15	7440-38-2	
Barium	**39.6**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:15	7440-39-3	
Cadmium	ND	mg/kg	0.53	1	11/03/21 06:50	11/03/21 16:15	7440-43-9	
Chromium	**8.6**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:15	7440-47-3	
Lead	**4.9**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:15	7439-92-1	
Selenium	ND	mg/kg	2.1	2	11/03/21 06:50	11/03/21 16:30	7782-49-2	D3
Silver	ND	mg/kg	0.53	1	11/03/21 06:50	11/03/21 16:15	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.23	1	10/31/21 13:27	11/01/21 09:30	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**11.2**	%	0.10	1		10/25/21 11:58		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB8 0-2 **Lab ID: 50300913019** Collected: 10/18/21 14:01 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**5.6**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:17	7440-38-2	
Barium	**22.3**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:17	7440-39-3	
Cadmium	ND	mg/kg	0.56	1	11/03/21 06:50	11/03/21 16:17	7440-43-9	
Chromium	**6.2**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:17	7440-47-3	
Lead	**19.1**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:17	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:17	7782-49-2	
Silver	ND	mg/kg	0.56	1	11/03/21 06:50	11/03/21 16:17	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.25	1	10/31/21 13:27	11/01/21 09:33	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**16.5**	%	0.10	1		10/25/21 11:58		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB8 6-8 **Lab ID: 50300913020** Collected: 10/18/21 14:01 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**5.8**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:23	7440-38-2	
Barium	**15.6**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:23	7440-39-3	
Cadmium	ND	mg/kg	0.55	1	11/03/21 06:50	11/03/21 16:23	7440-43-9	
Chromium	**8.8**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:23	7440-47-3	
Lead	**4.6**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:23	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 16:23	7782-49-2	
Silver	ND	mg/kg	0.55	1	11/03/21 06:50	11/03/21 16:23	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.22	1	10/31/21 13:27	11/01/21 09:35	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**14.6**	%	0.10	1		10/25/21 11:58		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB9 0-2 **Lab ID: 50300913021** Collected: 10/18/21 14:09 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**5.8**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 14:51	7440-38-2	
Barium	**21.1**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 14:51	7440-39-3	
Cadmium	ND	mg/kg	0.51	1	11/03/21 06:50	11/03/21 14:51	7440-43-9	
Chromium	**5.2**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 14:51	7440-47-3	
Lead	**12.2**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 14:51	7439-92-1	
Selenium	ND	mg/kg	1.0	1	11/03/21 06:50	11/03/21 14:51	7782-49-2	
Silver	ND	mg/kg	0.51	1	11/03/21 06:50	11/03/21 14:51	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.23	1	10/31/21 13:27	11/01/21 10:07	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**9.2**	%	0.10	1		10/25/21 11:58		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB9 2-4 **Lab ID: 50300913022** Collected: 10/18/21 14:09 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**2.0**	mg/kg	0.92	1	11/03/21 06:50	11/03/21 14:53	7440-38-2	
Barium	**14.6**	mg/kg	0.92	1	11/03/21 06:50	11/03/21 14:53	7440-39-3	
Cadmium	ND	mg/kg	0.46	1	11/03/21 06:50	11/03/21 14:53	7440-43-9	
Chromium	**4.0**	mg/kg	0.92	1	11/03/21 06:50	11/03/21 14:53	7440-47-3	
Lead	**3.4**	mg/kg	0.92	1	11/03/21 06:50	11/03/21 14:53	7439-92-1	
Selenium	ND	mg/kg	0.92	1	11/03/21 06:50	11/03/21 14:53	7782-49-2	
Silver	ND	mg/kg	0.46	1	11/03/21 06:50	11/03/21 14:53	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.20	1	10/31/21 13:27	11/01/21 10:09	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**4.8**	%	0.10	1		10/25/21 12:10		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB9 4-6 **Lab ID: 50300913023** Collected: 10/18/21 14:09 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**4.9**	mg/kg	0.92	1	11/03/21 06:50	11/03/21 14:55	7440-38-2	
Barium	**19.4**	mg/kg	0.92	1	11/03/21 06:50	11/03/21 14:55	7440-39-3	
Cadmium	ND	mg/kg	0.46	1	11/03/21 06:50	11/03/21 14:55	7440-43-9	
Chromium	**8.8**	mg/kg	0.92	1	11/03/21 06:50	11/03/21 14:55	7440-47-3	
Lead	**4.1**	mg/kg	0.92	1	11/03/21 06:50	11/03/21 14:55	7439-92-1	
Selenium	ND	mg/kg	0.92	1	11/03/21 06:50	11/03/21 14:55	7782-49-2	
Silver	ND	mg/kg	0.46	1	11/03/21 06:50	11/03/21 14:55	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.21	1	10/31/21 13:27	11/01/21 10:19	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**8.1**	%	0.10	1		10/25/21 12:10		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB10 0-2 **Lab ID: 50300913024** Collected: 10/18/21 14:20 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**4.9**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 14:57	7440-38-2	
Barium	**20.2**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 14:57	7440-39-3	
Cadmium	ND	mg/kg	0.56	1	11/03/21 06:50	11/03/21 14:57	7440-43-9	
Chromium	**6.4**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 14:57	7440-47-3	
Lead	**7.4**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 14:57	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 14:57	7782-49-2	
Silver	ND	mg/kg	0.56	1	11/03/21 06:50	11/03/21 14:57	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.23	1	10/31/21 13:27	11/01/21 10:22	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**15.1**	%	0.10	1		10/25/21 12:10		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB10 6-8 **Lab ID: 50300913025** Collected: 10/18/21 14:20 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**6.8**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 14:59	7440-38-2	
Barium	**15.9**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 14:59	7440-39-3	
Cadmium	ND	mg/kg	0.54	1	11/03/21 06:50	11/03/21 14:59	7440-43-9	
Chromium	**7.0**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 14:59	7440-47-3	
Lead	**6.4**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 14:59	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 14:59	7782-49-2	
Silver	ND	mg/kg	0.54	1	11/03/21 06:50	11/03/21 14:59	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.22	1	10/31/21 13:27	11/01/21 10:24	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**13.5**	%	0.10	1		10/25/21 12:10		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB11 0-2 **Lab ID: 50300913026** Collected: 10/18/21 14:29 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**4.3**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:01	7440-38-2	
Barium	**20.9**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:01	7440-39-3	
Cadmium	ND	mg/kg	0.52	1	11/03/21 06:50	11/03/21 15:01	7440-43-9	
Chromium	**5.7**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:01	7440-47-3	
Lead	**7.7**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:01	7439-92-1	
Selenium	ND	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:01	7782-49-2	
Silver	ND	mg/kg	0.52	1	11/03/21 06:50	11/03/21 15:01	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.23	1	10/31/21 13:27	11/01/21 10:27	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**14.9**	%	0.10	1		10/25/21 12:10		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB11 2-4 **Lab ID: 50300913027** Collected: 10/18/21 14:29 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**3.3**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:03	7440-38-2	
Barium	**15.8**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:03	7440-39-3	
Cadmium	ND	mg/kg	0.52	1	11/03/21 06:50	11/03/21 15:03	7440-43-9	
Chromium	**5.3**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:03	7440-47-3	
Lead	**3.1**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:03	7439-92-1	
Selenium	ND	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:03	7782-49-2	
Silver	ND	mg/kg	0.52	1	11/03/21 06:50	11/03/21 15:03	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.22	1	10/31/21 13:27	11/01/21 10:29	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**14.1**	%	0.10	1		10/25/21 12:10		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB11 6-8 **Lab ID: 50300913028** Collected: 10/18/21 14:29 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**11.3**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:05	7440-38-2	
Barium	**54.6**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:05	7440-39-3	
Cadmium	ND	mg/kg	0.51	1	11/03/21 06:50	11/03/21 15:05	7440-43-9	
Chromium	**21.6**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:05	7440-47-3	
Lead	**12.8**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:05	7439-92-1	
Selenium	ND	mg/kg	2.0	2	11/03/21 06:50	11/03/21 16:25	7782-49-2	D3
Silver	ND	mg/kg	0.51	1	11/03/21 06:50	11/03/21 15:05	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.25	1	10/31/21 13:27	11/01/21 10:31	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**17.9**	%	0.10	1		10/25/21 12:11		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB12 0-2 **Lab ID: 50300913029** Collected: 10/18/21 14:41 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**7.2**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:11	7440-38-2	
Barium	**19.2**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:11	7440-39-3	
Cadmium	ND	mg/kg	0.52	1	11/03/21 06:50	11/03/21 15:11	7440-43-9	
Chromium	**9.0**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:11	7440-47-3	
Lead	**5.3**	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:11	7439-92-1	
Selenium	ND	mg/kg	1.0	1	11/03/21 06:50	11/03/21 15:11	7782-49-2	
Silver	ND	mg/kg	0.52	1	11/03/21 06:50	11/03/21 15:11	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.22	1	10/31/21 13:27	11/01/21 10:34	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**11.0**	%	0.10	1		10/25/21 12:11		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Sample: SB12 2-4 **Lab ID: 50300913030** Collected: 10/18/21 14:41 Received: 10/22/21 09:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
	Pace Analytical Services - Indianapolis							
Arsenic	**4.3**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:13	7440-38-2	
Barium	**20.5**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:13	7440-39-3	
Cadmium	ND	mg/kg	0.55	1	11/03/21 06:50	11/03/21 15:13	7440-43-9	
Chromium	**6.2**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:13	7440-47-3	
Lead	**6.8**	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:13	7439-92-1	
Selenium	ND	mg/kg	1.1	1	11/03/21 06:50	11/03/21 15:13	7782-49-2	
Silver	ND	mg/kg	0.55	1	11/03/21 06:50	11/03/21 15:13	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
	Pace Analytical Services - Indianapolis							
Mercury	ND	mg/kg	0.24	1	10/31/21 13:27	11/01/21 10:36	7439-97-6	
Percent Moisture	Analytical Method: SM 2540G							
	Pace Analytical Services - Indianapolis							
Percent Moisture	**15.6**	%	0.10	1		10/25/21 12:11		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

QC Batch: 647536
QC Batch Method: EPA 7471
Analysis Method: EPA 7471
Analysis Description: 7471 Mercury
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 50300913001, 50300913002, 50300913003, 50300913004, 50300913005, 50300913006, 50300913007, 50300913008, 50300913009, 50300913010, 50300913011, 50300913012, 50300913013, 50300913014, 50300913015, 50300913016, 50300913017, 50300913018, 50300913019, 50300913020

METHOD BLANK: 2983623 Matrix: Solid
Associated Lab Samples: 50300913001, 50300913002, 50300913003, 50300913004, 50300913005, 50300913006, 50300913007, 50300913008, 50300913009, 50300913010, 50300913011, 50300913012, 50300913013, 50300913014, 50300913015, 50300913016, 50300913017, 50300913018, 50300913019, 50300913020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.19	11/01/21 08:27	

LABORATORY CONTROL SAMPLE: 2983624

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.51	0.55	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2983625 2983626

Parameter	Units	50300913001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	ND	0.55	0.57	0.63	0.64	108	107	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

QUALITY CONTROL DATA

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

QC Batch: 647537
QC Batch Method: EPA 7471
Analysis Method: EPA 7471
Analysis Description: 7471 Mercury
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 50300913021, 50300913022, 50300913023, 50300913024, 50300913025, 50300913026, 50300913027, 50300913028, 50300913029, 50300913030

METHOD BLANK: 2983633 Matrix: Solid
Associated Lab Samples: 50300913021, 50300913022, 50300913023, 50300913024, 50300913025, 50300913026, 50300913027, 50300913028, 50300913029, 50300913030

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.20	11/01/21 09:38	

LABORATORY CONTROL SAMPLE: 2983634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.49	0.52	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2983635 2983636

Parameter	Units	50300743001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	ND	0.54	0.59	0.61	0.66	106	105	75-125	7	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

QC Batch: 647044
QC Batch Method: EPA 3050
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 50300913001, 50300913002, 50300913003, 50300913004, 50300913005, 50300913006, 50300913007, 50300913008, 50300913009, 50300913010, 50300913011, 50300913012, 50300913013, 50300913014, 50300913015, 50300913016, 50300913017, 50300913018, 50300913019, 50300913020

METHOD BLANK: 2981321 Matrix: Solid
Associated Lab Samples: 50300913001, 50300913002, 50300913003, 50300913004, 50300913005, 50300913006, 50300913007, 50300913008, 50300913009, 50300913010, 50300913011, 50300913012, 50300913013, 50300913014, 50300913015, 50300913016, 50300913017, 50300913018, 50300913019, 50300913020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	ND	0.84	11/03/21 15:19	
Barium	mg/kg	ND	0.84	11/03/21 15:19	
Cadmium	mg/kg	ND	0.42	11/03/21 15:19	
Chromium	mg/kg	ND	0.84	11/03/21 15:19	
Lead	mg/kg	ND	0.84	11/03/21 15:19	
Selenium	mg/kg	ND	0.84	11/03/21 15:19	
Silver	mg/kg	ND	0.42	11/03/21 15:19	

LABORATORY CONTROL SAMPLE: 2981322

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	47	42.1	90	80-120	
Barium	mg/kg	47	44.4	94	80-120	
Cadmium	mg/kg	47	43.0	91	80-120	
Chromium	mg/kg	47	44.6	95	80-120	
Lead	mg/kg	47	43.5	92	80-120	
Selenium	mg/kg	47	42.6	91	80-120	
Silver	mg/kg	23.5	20.6	88	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2981323 2981324

Parameter	Units	50300913003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	15.8	50.8	48.2	54.5	50.8	76	73	75-125	7	20	M0
Barium	mg/kg	40.5	50.8	48.2	87.6	83.7	93	90	75-125	4	20	
Cadmium	mg/kg	ND	50.8	48.2	42.6	39.4	84	81	75-125	8	20	
Chromium	mg/kg	20.0	50.8	48.2	64.2	60.1	87	83	75-125	7	20	
Lead	mg/kg	9.5	50.8	48.2	46.9	42.8	74	69	75-125	9	20	M3
Selenium	mg/kg	ND	50.8	48.2	39.5	36.1	78	75	75-125	9	20	
Silver	mg/kg	ND	25.3	24.1	20.6	18.9	81	78	75-125	9	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

QC Batch: 647045
QC Batch Method: EPA 3050
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 50300913021, 50300913022, 50300913023, 50300913024, 50300913025, 50300913026, 50300913027, 50300913028, 50300913029, 50300913030

METHOD BLANK: 2981327 Matrix: Solid
Associated Lab Samples: 50300913021, 50300913022, 50300913023, 50300913024, 50300913025, 50300913026, 50300913027, 50300913028, 50300913029, 50300913030

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	ND	0.93	11/03/21 14:33	
Barium	mg/kg	ND	0.93	11/03/21 14:33	
Cadmium	mg/kg	ND	0.46	11/03/21 14:33	
Chromium	mg/kg	ND	0.93	11/03/21 14:33	
Lead	mg/kg	ND	0.93	11/03/21 14:33	
Selenium	mg/kg	ND	0.93	11/03/21 14:33	
Silver	mg/kg	ND	0.46	11/03/21 14:33	

LABORATORY CONTROL SAMPLE: 2981328

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	45.2	39.7	88	80-120	
Barium	mg/kg	45.2	41.2	91	80-120	
Cadmium	mg/kg	45.2	39.9	88	80-120	
Chromium	mg/kg	45.2	41.5	92	80-120	
Lead	mg/kg	45.2	40.0	88	80-120	
Selenium	mg/kg	45.2	39.8	88	80-120	
Silver	mg/kg	22.6	19.6	87	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2981329 2981330

Parameter	Units	50300836001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	3.8	47.7	46	42.3	44.4	81	88	75-125	5	20	
Barium	mg/kg	151	47.7	46	194	197	89	99	75-125	2	20	
Cadmium	mg/kg	1.8	47.7	46	40.2	42.0	80	87	75-125	4	20	
Chromium	mg/kg	51.4	47.7	46	86.6	90.1	74	84	75-125	4	20	M0
Lead	mg/kg	37.4	47.7	46	67.8	71.9	64	75	75-125	6	20	M0
Selenium	mg/kg	3.0	47.7	46	40.0	41.1	77	83	75-125	3	20	
Silver	mg/kg	1.3	23.9	23	21.2	21.6	84	89	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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QUALITY CONTROL DATA

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

QC Batch: 646639
QC Batch Method: SM 2540G
Analysis Method: SM 2540G
Analysis Description: Dry Weight/Percent Moisture
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 50300913001

SAMPLE DUPLICATE: 2979704

Parameter	Units	50300947003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	54.6	54.9	1	5	N2

SAMPLE DUPLICATE: 2979705

Parameter	Units	50300913001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	11.7	11.9	2	5	N2

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

QC Batch:	646640	Analysis Method:	SM 2540G
QC Batch Method:	SM 2540G	Analysis Description:	Dry Weight/Percent Moisture
		Laboratory:	Pace Analytical Services - Indianapolis

Associated Lab Samples: 50300913002, 50300913003, 50300913004, 50300913005, 50300913006, 50300913007, 50300913008, 50300913009, 50300913010, 50300913011, 50300913012, 50300913013, 50300913014, 50300913015, 50300913016, 50300913017, 50300913018, 50300913019, 50300913020, 50300913021

SAMPLE DUPLICATE: 2979706

Parameter	Units	50300913002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.0	14.1	1	5	N2

SAMPLE DUPLICATE: 2979707

Parameter	Units	50300913018 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	11.2	11.7	4	5	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

QC Batch: 646641
QC Batch Method: SM 2540G
Analysis Method: SM 2540G
Analysis Description: Dry Weight/Percent Moisture
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 50300913022, 50300913023, 50300913024, 50300913025, 50300913026, 50300913027, 50300913028, 50300913029, 50300913030

SAMPLE DUPLICATE: 2979708

Parameter	Units	50300913022 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	4.8	5.2	9	5	N2,R1

SAMPLE DUPLICATE: 2979709

Parameter	Units	50300913027 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.1	14.1	0	5	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALIFIERS

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.
R1	RPD value was outside control limits.

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METHOD CROSS REFERENCE TABLE

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Parameter	Matrix	Analytical Method	Preparation Method
6010 MET ICP	Solid	SW-846 6010B	SW-846 3050B
7471 Mercury	Solid	SW-846 7471A	SW-846 7471A

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50300913001	**SB1 0-2**	EPA 3050	647044	EPA 6010	648401
50300913002	**SB1 2-4**	EPA 3050	647044	EPA 6010	648401
50300913003	**SB1 6-8**	EPA 3050	647044	EPA 6010	648401
50300913004	**SB2 0-2**	EPA 3050	647044	EPA 6010	648401
50300913005	**SB2 4-6**	EPA 3050	647044	EPA 6010	648401
50300913006	**SB3 0-2**	EPA 3050	647044	EPA 6010	648401
50300913007	**SB3 2-4**	EPA 3050	647044	EPA 6010	648401
50300913008	**SB3 6-8**	EPA 3050	647044	EPA 6010	648401
50300913009	**SB4 0-2**	EPA 3050	647044	EPA 6010	648401
50300913010	**SB4 2-4**	EPA 3050	647044	EPA 6010	648401
50300913011	**SB5 0-2**	EPA 3050	647044	EPA 6010	648401
50300913012	**SB5 2-4**	EPA 3050	647044	EPA 6010	648401
50300913013	**SB5 6-8**	EPA 3050	647044	EPA 6010	648401
50300913014	**SB6 0-2**	EPA 3050	647044	EPA 6010	648401
50300913015	**SB6 2-4**	EPA 3050	647044	EPA 6010	648401
50300913016	**SB7 0-2**	EPA 3050	647044	EPA 6010	648401
50300913017	**SB7 2-4**	EPA 3050	647044	EPA 6010	648401
50300913018	**SB7 6-8**	EPA 3050	647044	EPA 6010	648401
50300913019	**SB8 0-2**	EPA 3050	647044	EPA 6010	648401
50300913020	**SB8 6-8**	EPA 3050	647044	EPA 6010	648401
50300913021	**SB9 0-2**	EPA 3050	647045	EPA 6010	648400
50300913022	**SB9 2-4**	EPA 3050	647045	EPA 6010	648400
50300913023	**SB9 4-6**	EPA 3050	647045	EPA 6010	648400
50300913024	**SB10 0-2**	EPA 3050	647045	EPA 6010	648400
50300913025	**SB10 6-8**	EPA 3050	647045	EPA 6010	648400
50300913026	**SB11 0-2**	EPA 3050	647045	EPA 6010	648400
50300913027	**SB11 2-4**	EPA 3050	647045	EPA 6010	648400
50300913028	**SB11 6-8**	EPA 3050	647045	EPA 6010	648400
50300913029	**SB12 0-2**	EPA 3050	647045	EPA 6010	648400
50300913030	**SB12 2-4**	EPA 3050	647045	EPA 6010	648400
50300913001	**SB1 0-2**	EPA 7471	647536	EPA 7471	647853
50300913002	**SB1 2-4**	EPA 7471	647536	EPA 7471	647853
50300913003	**SB1 6-8**	EPA 7471	647536	EPA 7471	647853
50300913004	**SB2 0-2**	EPA 7471	647536	EPA 7471	647853
50300913005	**SB2 4-6**	EPA 7471	647536	EPA 7471	647853
50300913006	**SB3 0-2**	EPA 7471	647536	EPA 7471	647853
50300913007	**SB3 2-4**	EPA 7471	647536	EPA 7471	647853
50300913008	**SB3 6-8**	EPA 7471	647536	EPA 7471	647853
50300913009	**SB4 0-2**	EPA 7471	647536	EPA 7471	647853
50300913010	**SB4 2-4**	EPA 7471	647536	EPA 7471	647853
50300913011	**SB5 0-2**	EPA 7471	647536	EPA 7471	647853
50300913012	**SB5 2-4**	EPA 7471	647536	EPA 7471	647853
50300913013	**SB5 6-8**	EPA 7471	647536	EPA 7471	647853
50300913014	**SB6 0-2**	EPA 7471	647536	EPA 7471	647853
50300913015	**SB6 2-4**	EPA 7471	647536	EPA 7471	647853
50300913016	**SB7 0-2**	EPA 7471	647536	EPA 7471	647853
50300913017	**SB7 2-4**	EPA 7471	647536	EPA 7471	647853
50300913018	**SB7 6-8**	EPA 7471	647536	EPA 7471	647853

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Amherst #2 Sub / 167911
Pace Project No.: 50300913

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50300913019	**SB8 0-2**	EPA 7471	647536	EPA 7471	647853
50300913020	**SB8 6-8**	EPA 7471	647536	EPA 7471	647853
50300913021	**SB9 0-2**	EPA 7471	647537	EPA 7471	647854
50300913022	**SB9 2-4**	EPA 7471	647537	EPA 7471	647854
50300913023	**SB9 4-6**	EPA 7471	647537	EPA 7471	647854
50300913024	**SB10 0-2**	EPA 7471	647537	EPA 7471	647854
50300913025	**SB10 6-8**	EPA 7471	647537	EPA 7471	647854
50300913026	**SB11 0-2**	EPA 7471	647537	EPA 7471	647854
50300913027	**SB11 2-4**	EPA 7471	647537	EPA 7471	647854
50300913028	**SB11 6-8**	EPA 7471	647537	EPA 7471	647854
50300913029	**SB12 0-2**	EPA 7471	647537	EPA 7471	647854
50300913030	**SB12 2-4**	EPA 7471	647537	EPA 7471	647854
50300913001	**SB1 0-2**	SM 2540G	646639		
50300913002	**SB1 2-4**	SM 2540G	646640		
50300913003	**SB1 6-8**	SM 2540G	646640		
50300913004	**SB2 0-2**	SM 2540G	646640		
50300913005	**SB2 4-6**	SM 2540G	646640		
50300913006	**SB3 0-2**	SM 2540G	646640		
50300913007	**SB3 2-4**	SM 2540G	646640		
50300913008	**SB3 6-8**	SM 2540G	646640		
50300913009	**SB4 0-2**	SM 2540G	646640		
50300913010	**SB4 2-4**	SM 2540G	646640		
50300913011	**SB5 0-2**	SM 2540G	646640		
50300913012	**SB5 2-4**	SM 2540G	646640		
50300913013	**SB5 6-8**	SM 2540G	646640		
50300913014	**SB6 0-2**	SM 2540G	646640		
50300913015	**SB6 2-4**	SM 2540G	646640		
50300913016	**SB7 0-2**	SM 2540G	646640		
50300913017	**SB7 2-4**	SM 2540G	646640		
50300913018	**SB7 6-8**	SM 2540G	646640		
50300913019	**SB8 0-2**	SM 2540G	646640		
50300913020	**SB8 6-8**	SM 2540G	646640		
50300913021	**SB9 0-2**	SM 2540G	646640		
50300913022	**SB9 2-4**	SM 2540G	646641		
50300913023	**SB9 4-6**	SM 2540G	646641		
50300913024	**SB10 0-2**	SM 2540G	646641		
50300913025	**SB10 6-8**	SM 2540G	646641		
50300913026	**SB11 0-2**	SM 2540G	646641		
50300913027	**SB11 2-4**	SM 2540G	646641		
50300913028	**SB11 6-8**	SM 2540G	646641		
50300913029	**SB12 0-2**	SM 2540G	646641		
50300913030	**SB12 2-4**	SM 2540G	646641		

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder/ MT

WO# : 50300913

50300913

ALL SHADED A

Company:	POWER Engineers Inc.
Address:	11733 Chesterdale Rd.
Report To:	Eric Riekert
Copy To:	
Customer Project Name/Number:	Amherst #2 Sub/ 167911
Phone: 513.326-1525 Email:	
Collected By (print):	Frank Schuler
Collected By (signature):	
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: ____ [X] Hold: Wait Further notice	

Billing Information: POWER Engineers Inc. 11733 Chesterdale Rd. Cincinnati, OH 45246

Email To: ericriekert@powereng.com

Site Collection Info/Address:

State: OH County/City: Lorain/Amherst Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET

Site/Facility ID #:

Compliance Monitoring? [ ] Yes [X] No

Purchase Order #: Quote #: 0098283

DW PWS ID #: DW Location Code:

Turnaround Date Required:

Immediately Packed on Ice: [X] Yes [ ] No

Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)

Field Filtered (if applicable): [ ] Yes [ ] No

Analysis: ____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Container Preservative Type **: U

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other ____

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: Total RCRA metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag)	Lab Sample # / Comments
SB1 0-2	SL	G	10/18/21	1240				1	X	001
SB1 2-4	SL	G	10/18/21	1240				1	X	002
SB1 6-8	SL	G	10/18/21	1240				1	X	003
SB2 0-2	SL	G	10/18/21	1227				1	X	004
SB2 4-6	SL	G	10/18/21	1227				1	X	005
SB3 0-2	SL	G	10/18/21	1257				1	X	006
SB3 2-4	SL	G	10/18/21	1257				1	X	007
SB3 6-8	SL	G	10/18/21	1257				1	X	008
SB4 0-2	SL	G	10/18/21	1309				1	X	009
SB4 2-4	SL	G	10/18/21	1309				1	X	010

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips: ____	
Sample pH Acceptable	Y N NA
pH Strips: ____	
Sulfide Present	Y N NA
Lead Acetate Strips: ____	

LAB USE ONLY: Lab Sample # / Comments: See Scuy

Customer Remarks / Special Conditions / Possible Hazards: Hold remaining sample following analyses for future TCLP analyses

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2657472

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:

Temp Blank Received: (Y) N NA

Therm ID#: D

Cooler 1 Temp Upon Receipt: 0.6 oC

Cooler 1 Therm Corr. Factor: 0.0 oC

Cooler 1 Corrected Temp: 0.6 oC

Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
	10/21/21 1438	Pace DK4	10/21/21 1438
Pace	10/21/21 1700	Fed Ex	10/21/21 1705
fedex	10/22/21 0920		10/22/21 0920

MTJL LAB USE ONLY

Table #:

Acctnum:

Template:

Prelogin:

PM:

PB:

Trip Blank Received: Y N NA

HCL MeOH TSP Other

Non Conformance(s): YES / NO

Pace Analytical

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

Company: POWER Engineers, Inc.
Address: 11733 Chesterdale Road, Cincinnati, OH 45246
Report To: Eric Rickert
Copy To:
Customer Project Name/Number:

Billing Information: Power Engineers, Inc., 11733 Chesterdale Road, Cincinnati, OH 45246
Email To: eric_rickert@powereng.com
Site Collection Info/Address:
State: / County/City: Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET

Phone:
Email:
Site/Facility ID #:
Compliance Monitoring? [ ] Yes [X] No

Collected By (print): Frank Schulen
Purchase Order #:
Quote #: 0098283
DW PWS ID #:
DW Location Code:

Collected By (signature): [signature]
Turnaround Date Required:
Immediately Packed on Ice: [X] Yes [ ] No

Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: [X] Hold: until further notice
Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)
Field Filtered (if applicable): [ ] Yes [ ] No
Analysis: ______

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Time	Composite End Date	Time	Res Cl	# of Ctns	Total RCRA Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag)	Lab Sample # / Comments
SB5 0-2	SL	G	10/18/21	1320				1	X	011
SB5 2-4	SL	G	10/18/21	1320				1	X	012
SB5 6-8	SL	G	10/18/21	1320				1	X	013
SB6 0-2	SL	G	10/18/21	1341				1	X	014
SB6 2-4	SL	G	10/18/21	1341				1	X	015
SB7 0-2	SL	G	10/18/21	1350				1	X	016
SB7 2-4	SL	G	10/18/21	1350				1	X	017
SB7 6-8	SL	G	10/18/21	1350				1	X	018
SB8 0-2	SL	G	10/18/21	1401				1	X	019
SB8 6-8	SL	G	10/18/21	1401				1	X	020

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None
Packing Material Used:
Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A
Lab Tracking #: 2657473
Samples received via: FEDEX UPS Client Courier Pace Courier

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
[signature]	10/21/21, 1438	[signature] - Pace NKY	10/21/21 1438
Pace NKY [signature]	10/21/21 1700	Fed Ex	10/21/21 1700
FedEx	10/22/21 0920	[signature]	10/22/21 0920

LAB USE ONLY

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

ALL SHADED AREAS are for LAB USE ONLY

Container Preservative Type ** : U

Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other ______

Analyses

Lab Profile/Line:

Lab Sample Receipt Checklist:
- Custody Seals Present/Intact Y N NA
- Custody Signatures Present Y N NA
- Collector Signature Present Y N NA
- Bottles Intact Y N NA
- Correct Bottles Y N NA
- Sufficient Volume Y N NA
- Samples Received on Ice Y N NA
- VOA - Headspace Acceptable Y N NA
- USDA Regulated Soils Y N NA
- Samples in Holding Time Y N NA
- Residual Chlorine Present Y N NA
- Cl Strips: ______
- Sample pH Acceptable Y N NA
- pH Strips: ______
- Sulfide Present Y N NA
- Lead Acetate Strips: ______

LAB USE ONLY:
Lab Sample # / Comments: See Scan

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Lab Sample Temperature Info:
Temp Blank Received: (Y) N NA
Therm ID#: D
Cooler 1 Temp Upon Receipt: 0.6 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 0.6 oC
Comments:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO
Page: 2 of: 3

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

ALL SHADED AREAS are for LAB USE ONLY

Company: Powfr Engineers Inc.	Billing Information: Power Engineers, Inc. 11733 Chesterdale Road Cincinnati, OH 45246
Address:	
Report To: Eric Rickert	Email To: Eric.Rickert@powereng.com
Copy To:	Site Collection Info/Address:
Customer Project Name/Number:	State: / County/City: Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET
Phone: Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [X] No
Collected By (print): Frank Schiele	Purchase Order #: Quote #: 0098283 DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: [X] Hold: until further notice	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply) Field Filtered (if applicable): [ ] Yes [ ] No Analysis:

Container Preservative Type **: U

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other

Lab Project Manager:

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y	N	NA
Custody Signatures Present	Y	N	NA
Collector Signature Present	Y	N	NA
Bottles Intact	Y	N	NA
Correct Bottles	Y	N	NA
Sufficient Volume	Y	N	NA
Samples Received on Ice	Y	N	NA
VOA - Headspace Acceptable	Y	N	NA
USDA Regulated Soils	Y	N	NA
Samples in Holding Time	Y	N	NA
Residual Chlorine Present	Y	N	NA
Cl Strips:			
Sample pH Acceptable	Y	N	NA
pH Strips:			
Sulfide Present	Y	N	NA
Lead Acetate Strips:			

LAB USE ONLY:

Lab Sample # / Comments:

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: Total RCRA Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag)	Lab Sample # / Comments
SB9 0-2	SL	G	10/18/21	1409				1	X	021
SB9 2-4	SL	G	10/18/21	1409				1	X	022
SB9 4-6	SL	G	10/18/21	1409				1	X	023
SB10 0-2	SL	G	10/18/21	1420				1	X	024
SB10 6-8	SL	G	10/18/21	1420				1	X	025
SB11 0-2	SL	G	10/18/21	1429				1	X	026
SB11 2-4	SL	G	10/18/21	1429				1	X	027
SB11 6-8	SL	G	10/18/21	1429				1	X	028
SB12 0-2	SL	G	10/18/21	1441				1	X	029
SB12 2-4	SL	G	10/18/21	1441				1	X	030

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2657474

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: D
Cooler 1 Temp Upon Receipt: 0.6 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 0.6 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time: 10/21/21 1438	Received by/Company: (Signature) Pace UPS	Date/Time: 10/21/21 1438	MTJL LAB USE ONLY Table #:
Relinquished by/Company: (Signature) Pace UPS	Date/Time: 10/21/21 1700	Received by/Company: (Signature) Fed Ex	Date/Time: 10/21/21 1700	Acctnum: Template: Prelogin:
Relinquished by/Company: (Signature) FedEx	Date/Time: 10/22/21 0920	Received by/Company: (Signature)	Date/Time: 10/22/21 0920	PM: PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Pace Analytical®

SAMPLE CONDITION UPON RECEIPT FORM

Date/Time and Initials of person examining contents: MCS 10/22/21 1500

1. **Courier:** ☑ FED EX ☐ UPS ☐ CLIENT ☐ PACE ☐ USPS ☐ OTHER _____
2. **Custody Seal on Cooler/Box Present:** ☐ Yes ☑ No
   (If yes)Seals Intact: ☐ Yes ☐ No (leave blank if no seals were present)
3. **Thermometer:** 1 2 3 4 5 6 A B C (D) E F
4. **Cooler Temperature:** 0.6o / 0.6° (initial/Corrected)
   Temp should be above freezing to 6°C

5. **Packing Material:** ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other _____
6. **Ice Type:** ☑ Wet ☐ Blue ☐ None
7. **If temp. is over 6°C or under 0°C, was the PM notified?:** ☐ Yes ☐ No

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
USDA Regulated Soils? (HI, ID, NY, WA, OR,CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		✓	All containers needing acid/base pres. Have been CHECKED?: **exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.** **Circle: HNO3 (<2) H2SO4 (<2) NaOH (>10) NaOH/ZnAc (>9)** Any non-conformance to pH recommendations will be noted on the container count form			✓
Short Hold Time Analysis (48 hours or less)? Analysis:		✓				
Time 5035A TC placed in Freezer or Short Holds To Lab	Time:			Present	Absent	N/A
			Residual Chlorine Check (SVOC 625 Pest/PCB 608)			✓
Rush TAT Requested (4 days or less):		✓	Residual Chlorine Check (Total/Amenable/Free Cyanide)			✓
Custody Signatures Present?	✓		Headspace Wisconsin Sulfide?			✓
Containers Intact?:	✓		Headspace in VOA Vials (>6mm): See Containter Count form for details	Present	Absent	No VOA Vials Sent ✓
Sample Label (IDs/Dates/Times) Match COC?: Except TCs, which only require sample ID	✓		Trip Blank Present?		✓	
Extra labels on Terracore Vials? (soils only)		✓	Trip Blank Custody Seals?:			✓

COMMENTS:

COC PAGE 1 of 3

Sample Container Count

SBS
DI
MeOH (only)
BK
Kit

** Place a RED dot on containers that are out of conformance **

COC Line Item	WGFU	R	DG9H VG9H	VOA VIAL HS (>4mm)	VG9U	DG9U	VG9T	AG0U	AG1H	AG1U	AG2U	AG3S	AG3SF	AG3C	BP1U	BP1N	BP2U	BP3U	BP3N	BP3F	BP3S	BP3B	BP3Z	CG3H	Syringe Kit			Matrix	HNO3/ H2SO4 pH <2	NaOH/ ZNAc pH >9	NaOH pH>10
1	1																											SL			
2																															
3																															
4																															
5																															
6																															
7																															
8																															
9																															
10																															
11																															
12																															

Container Codes

Glass

DG9H	40mL HCl amber voa vial	BG1T	1L Na Thiosulfate clear glass	BP1B	1L NaOH plastic
DG9P	40mL TSP amber vial	BG1U	1L unpreserved glass	BP1N	1L HNO3 plastic
DG9S	40mL H2SO4 amber vial	BG3H	250mL HCl Clear Glass	BP1S	1L H2SO4 plastic
DG9T	40mL Na Thio amber vial	BG3U	250mL Unpres Clear Glass	BP1U	1L unpreserved plastic
DG9U	40mL unpreserved amber vial	AG0U	100mL unpres amber glass	BP1Z	1L NaOH, Zn, Ac
VG9H	40mL HCl clear vial	AG1H	1L HCl amber glass	BP2N	500mL HNO3 plastic
VG9T	40mL Na Thio clear vial	AG1S	1L H2SO4 amber glass	BP2C	500mL NaOH plastic
VG9U	40mL unpreserved clear vial	AG1T	1L Na Thiosulfate amber glass	BP2S	500mL H2SO4 plastic
I	40mL w/hexane wipe vial	AG1U	1liter unpres amber glass	BP2U	500mL unpreserved plastic
WGKU	8oz unpreserved clear jar	AG2N	500mL HNO3 amber glass	BP2Z	500mL NaOH, Zn Ac
WGFU	4oz clear soil jar	AG2S	500mL H2SO4 amber glass	BP3B	250mL NaOH plastic
JGFU	4oz unpreserved amber wide	AG2U	500mL unpres amber glass	BP3N	250mL HNO3 plastic
CG3H	250mL clear glass HCl	AG3S	250mL H2SO4 amber glass	BP3F	250mL HNO3 plastic-field filtered
BG1H	1L HCl clear glass	AG3SF	250mL H2SO4 amb glass -field filtered	BP3U	250mL unpreserved plastic
BG1S	1L H2SO4 clear glass	AG3U	250mL unpres amber glass	BP3S	250mL H2SO4 plastic
GN	General	AG3C	250mL NaOH amber glass	BP3Z	250mL NaOH, ZnAc plastic

Plastic / Misc.

BP4U	125mL unpreserved plastic
BP4N	125mL HNO3 plastic
BP4S	125mL H2SO4 plastic

Syringe Kit	LL Cr+6 sampling kit

AF	Air Filter
C	Air Cassettes
R	Terracore kit
SP5T	120mL Coliform Na Thiosulfate
U	Summa Can
ZPLC	Ziploc Bag

WT		Water	
SL		Solid	
NAL	OL	Non-aqueous liquid	Oil
WP		Wipe	

COC PAGE 2 of 3

Sample Container Count

SBS
DI
MeOH [illegible]
BK
Kit

** Place a RED dot on containers that are out of conformance **

COC Line Item	WGFU	R	DG9H VG9H	VOA VIAL HS (>6mm)	VG9U	DG9U	VG9T	AG0U	AG1H	AG1U	AG2U	AG3S	AG3SF	AG3C	BP1U	BP1N	BP2U	BP3U	BP3N	BP3F	BP3S	BP3B	BP3Z	CG3H	Syringe Kit			Matrix	HNO3/ H2SO4 pH <2	NaOH/ ZNAc pH >9	NaOH pH>10
1	1																											SL			
2																															
3																															
4																															
5																															
6																															
7																															
8																															
9																															
10																															
11																															
12																															

Container Codes

Glass

DG9H	40mL HCl amber voa vial	BG1T	1L Na Thiosulfate clear glass
DG9P	40mL TSP amber vial	BG1U	1L unpreserved glass
DG9S	40mL H2SO4 amber vial	BG3H	250mL HCl Clear Glass
DG9T	40mL Na Thio amber vial	BG3U	250mL Unpres Clear Glass
DG9U	40mL unpreserved amber vial	AG0U	100mL unpres amber glass
VG9H	40mL HCl clear vial	AG1H	1L HCl amber glass
VG9T	40mL Na Thio. clear vial	AG1S	1L H2SO4 amber glass
VG9U	40mL unpreserved clear vial	AG1T	1L Na Thiosulfate amber glass
I	40mL w/hexane wipe vial	AG1U	1liter unpres amber glass
WGKU	8oz unpreserved clear jar	AG2N	500mL HNO3 amber glass
WGFU	4oz clear soil jar	AG2S	500mL H2SO4 amber glass
JGFU	4oz unpreserved amber wide	AG2U	500mL unpres amber glass
CG3H	250mL clear glass HCl	AG3S	250mL H2SO4 amber glass
BG1H	1L HCl clear glass	AG3SF	250mL H2SO4 amb glass -field filtered
BG1S	1L H2SO4 clear glass	AG3U	250mL unpres amber glass
GN	General	AG3C	250mL NaOH amber glass

Plastic / Misc.

BP1B	1L NaOH plastic
BP1N	1L HNO3 plastic
BP1S	1L H2SO4 plastic
BP1U	1L unpreserved plastic
BP1Z	1L NaOH, Zn, Ac
BP2N	500mL HNO3 plastic
BP2C	500mL NaOH plastic
BP2S	500mL H2SO4 plastic
BP2U	500mL unpreserved plastic
BP2Z	500mL NaOH, Zn Ac
BP3B	250mL NaOH plastic
BP3N	250mL HNO3 plastic
BP3F	250mL HNO3 plastic-field filtered
BP3U	250mL unpreserved plastic
BP3S	250mL H2SO4 plastic
BP3Z	250mL NaOH, ZnAc plastic

BP4U	125mL unpreserved plastic
BP4N	125mL HNO3 plastic
BP4S	125mL H2SO4 plastic

Syringe Kit	LL Cr+6 sampling kit

AF	Air Filter
C	Air Cassettes
R	Terracore kit
SP5T	120mL Coliform Na Thiosulfate
U	Summa Can
ZPLC	Ziploc Bag

WT		Water	
SL		Solid	
NAL	OL	Non-aqueous liquid	Oil
WP		Wipe	

F-IN-Q-270-rev.13, 17May2021

COC PAGE 3 **of** 3

Sample Container Count

SBS
DI
MeOH
BK
Kit

** Place a RED dot on containers that are out of conformance **

COC Line Item	WGFU	R	DG9H VG9H	VOA VIAL HS (>4mm)	VG9U	DG9U	VG9T	AG0U	AG1H	AG1U	AG2U	AG3S	AG3SF	AG3C	BP1U	BP1N	BP2U	BP3U	BP3N	BP3F	BP3S	BP3B	BP3Z	CG3H	Syringe Kit			Matrix	HNO3/ H2SO4 pH <2	NaOH/ ZNAc pH >9	NaOH pH>10
1	I																											SL			
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4																															
5																															
6																															
7																															
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9																															
10																															
11																															
12																															

Container Codes

Glass

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DG9P	40mL TSP amber vial	BG1U	1L unpreserved glass	BP1N	1L HNO3 plastic
DG9S	40mL H2SO4 amber vial	BG3H	250mL HCl Clear Glass	BP1S	1L H2SO4 plastic
DG9T	40mL Na Thio amber vial	BG3U	250mL Unpres Clear Glass	BP1U	1L unpreserved plastic
DG9U	40mL unpreserved amber vial	AG0U	100mL unpres amber glass	BP1Z	1L NaOH, Zn, Ac
VG9H	40mL HCl clear vial	AG1H	1L HCl amber glass	BP2N	500mL HNO3 plastic
VG9T	40mL Na Thio. clear vial	AG1S	1L H2SO4 amber glass	BP2C	500mL NaOH plastic
VG9U	40mL unpreserved clear vial	AG1T	1L Na Thiosulfate amber glass	BP2S	500mL H2SO4 plastic
I	40mL w/hexane wipe vial	AG1U	1liter unpres amber glass	BP2U	500mL unpreserved plastic
WGKU	8oz unpreserved clear jar	AG2N	500mL HNO3 amber glass	BP2Z	500mL NaOH, Zn Ac
WGFU	4oz clear soil jar	AG2S	500mL H2SO4 amber glass	BP3B	250mL NaOH plastic
JGFU	4oz unpreserved amber wide	AG2U	500mL unpres amber glass	BP3N	250mL HNO3 plastic
CG3H	250mL clear glass HCl	AG3S	250mL H2SO4 amber glass	BP3F	250mL HNO3 plastic-field filtered
BG1H	1L HCl clear glass	AG3SF	250mL H2SO4 amb glass -field filtered	BP3U	250mL unpreserved plastic
BG1S	1L H2SO4 clear glass	AG3U	250mL unpres amber glass	BP3S	250mL H2SO4 plastic
GN	General	AG3C	250mL NaOH amber glass	BP3Z	250mL NaOH, ZnAc plastic

Plastic / Misc.

BP4U	125mL unpreserved plastic
BP4N	125mL HNO3 plastic
BP4S	125mL H2SO4 plastic

Syringe Kit	LL Cr+6 sampling kit

AF	Air Filter
C	Air Cassettes
R	Terracore kit
SP5T	120mL Coliform Na Thiosulfate
U	Summa Can
ZPLC	Ziploc Bag

WT		Water	
SL		Solid	
NAL	OL	Non-aqueous liquid	Oil
WP		Wipe	

APPENDIX H GEOTECHICAL EXPLORATION REPORTS

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GEOTECHNOLOGY

A Universal Engineering Sciences Company

GEOTECHNICAL EXPLORATION
AMPT - AMHERST #2 TRANSMISSION LINE
AMHERST, OHIO

Prepared for:

EMERALD ENERGY & EXPLORATION LAND COMPANY
LOUISVILLE, KENTUCKY

Prepared by:

GEOTECHNOLOGY, LLC
ERLANGER, KENTUCKY

Date:

NOVEMBER 18, 2021

Geotechnology Project No.:

J037566.01

SAFETY
QUALITY
INTEGRITY
PARTNERSHIP
OPPORTUNITY
RESPONSIVENESS

GEOTECHNOLOGY
A Universal Engineering Sciences Company

November 18, 2021

Mr. Neil Salyer
Emerald Energy & Exploration Land Company
9850 Von Allmen Court
Suite 201
Louisville, Kentucky 40241

Re: Geotechnical Exploration
AMPT - Amherst #2 Transmission Line
Amherst, Ohio
Geotechnology Project No. J037566.01

Dear Mr. Salyer:

Presented in this report are the results of our geotechnical exploration completed for the proposed Transmission Line, connecting to the proposed expansion of the Amherst #2 138kV substation facility in Amherst, Ohio. Our services were performed in general accordance with Phase II of the Base Scope described in our Proposal P037566.01R-1, which was authorized under Task Order #001, dated June 14, 2021, except one of the borings was eliminated.

We appreciate the opportunity to provide the geotechnical services for this project. If you have any questions regarding this report, or if we may be of any additional service to you, please do not hesitate to contact us.

Respectfully submitted,
GEOTECHNOLOGY, LLC

Andrew S. Dingler, EI
Project Geotechnical Engineer

Joseph D. Hauber, PE
Principal Geotechnical Engineer

ASD/JDH:asd/jdh

Copies submitted: Emerald Energy & Exploration Land Company (email)

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GEOTECHNOLOGY
A Universal Engineering Sciences Company

GEOTECHNICAL EXPLORATION
AMPT - AMHERST #2 TRANSMISSION LINE
AMHERST, OHIO
November 18, 2021 | Geotechnology Project No. J037566.01

1.0 INTRODUCTION

Geotechnology, LLC (Geotechnology) prepared this geotechnical exploration report for Emerald Energy & Exploration Land Company (E3CO) for the proposed Transmission Line connecting to the expansion of the existing Amherst #2 138kV substation facility that is located at 1163 Milan Avenue, Amherst, Ohio 44001.

The purposes of the geotechnical exploration were: to evaluate the general subsurface profile at the proposed monopoles for the transmission line and the engineering properties of the soils and bedrock; and to develop recommendations for the geotechnical aspects of the design and construction of the project, as defined in our proposal. Our scope of services included a site reconnaissance, geotechnical borings, laboratory testing, engineering analyses, and preparation of this report.

2.0 PROJECT INFORMATION

The following project information was derived from:

- Correspondence with E3CO and POWER Engineers, Inc. (POWER).

The project will involve a new 138kV transmission line, which will generally parallel the train tracks[1] located to the north of the existing substation at 1163 Milan Avenue in Amherst, Ohio. The transmission line will run through the wooded area behind the neighboring homes to the west of the substation. The proposed transmission line will be roughly 2,250 feet long, extending from the proposed substation addition covered in our previous geotechnical report dated July 9, 2021, to an existing monopole located on a knob at the western end of the transmission line. Originally, five monopoles, denoted as Structures 1006A through 1006E, were planned to support the proposed transmission line between the substation and existing monopole at the west end of the line; however, we understand that Structure 1006A was eliminated after review of the design of the existing monopole and its foundations at the west end. Our understanding is that the new monopoles will be supported on drilled shaft foundations and will be subjected to relatively high lateral loads and moments, and relatively light axial loads.

[1] For the purposes of this report, the train tracks are assumed to be oriented in an east-west direction.

The Exploration Plans included in Appendix B of this report illustrate the locations of the proposed monopole structures and transmission line, as well as the existing monopole.

3.0 GEOLOGY

The project site is located within the Berea Headlands of the Erie Lake Plain. Based on the Physiographic Regions Map of Ohio, the subsurface geology in this area generally consists of thin lacustrine (lakebed) deposits over thin, wave-planed, clayey, medium-lime Wisconsinan-age till over resistant Berea Sandstone (Ohio Division of Geological Survey 1998).

The Surficial Geology of the Lorain and Put-in-Bay 30x60 Minute Quadrangles Map (Pavey et al. 1999) indicates that this area was quarried (presumably for the Berea Sandstone) but is also underlain by Wisconsinan-age sand and gravel (SG) over intermittent Wisconsinan-age till (T) over Mississippian-age sandstone and shale (SSh). The sand and gravel (SG) is described as interbedded and commonly contains, thin discontinuous layers of silt and clay. The till (T) is described as an unsorted mixture of silt, clay, sand, gravel, and boulders, occasionally containing lenses of silt, sand, and/or gravel. Within the till, the percentage of clay decreases with depth, whereas the percentage of sand increases with depth.

According to the preliminary bedrock geology map of the Vermilion East, Ohio quadrangle (Larsen and Vorbau 1999), the bedrock underlying the overburden soils belongs to the Berea Sandstone and Bedford Shale, Undivided Formation. Shrake et al. (2011) describe this formation as follows:

- The Berea Sandstone is comprised of sandstone and minor shale that is brown in color and weathers light brown to reddish brown. Bedding is thin to thick, and planar to lenticular. The thickness of this component of the formation typically varies from 5 to 75 feet thick, but is locally 100 to 125 feet thick.

- The Bedford Shale is comprised of shale and interbedded siltstone and sandstone. Coloring is gray to brown and locally reddish brown. Bedding is thin to medium and planar to lenticular. The thickness of this formation is 80 to 180 feet and is locally thin to absent where the Berea Sandstone is thick.

4.0 SITE CONDITIONS

The site location and regional topography of the area are shown on the Transmission Line Site Location Plan included in Appendix B.

The corridor for the transmission line is bounded by railroad tracks to the north and by an old quarry site to the south that is located along Quarry Road. Evidence of the quarrying operations included:

- The steep-sided knob on which the existing monopole at the west end of the alignment is located.

- Vertical bedrock outcrops along the south rim of the residential property to the south of Structure 1006A (now eliminated).
- A ridgeline formed by the historic quarrying operations along the north side of the corridor between Structures 1006A and 1006B.
- Remnant sandstone boulders that occasionally lined Quarry Road (see Figure 1).

Figure 1. Sandstone boulder to the west of Boring B-103 (looking west).

With the elimination of Structure 1006A, the monopoles at Structures 1006B through 1006E are located on relatively level to gently sloping terrain with grades varying from around El. 700 near Structure 1006B to around El. 690 near Structures 1006D and 1006E. This section of the transmission line alignment runs through a wooded area with large and small trees, vines, and low ground cover shrubs as seen in Figure 2. Near the location of Structure 1006C is a dump site filled with broken glass, glass bottles, metal, wood, ceramic jugs, and other various trash. There are a few delineated wetlands within the vicinity of the transmission line alignment that were identified by others, and are shown on the Exploration Plans in Appendix B.

Figure 2. Wooded terrain surrounding Boring B-102 (looking north toward train tracks).

5.0 SUBSURFACE EXPLORATION

The subsurface exploration for the transmission line monopoles consisted of three new borings (numbered B-101 through B-103). The boring locations were selected by us with input from POWER and were staked in the field by us using a handheld Trimble Geo7X GPS unit. The locations of the borings are shown on our Exploration Plans, which are included in Appendix B.

The borings were drilled on October 21 and 22, 2021, with a track-mounted Mobile B-57 drill rig advancing hollow-stem augers, as indicated on the boring logs presented in Appendix C. Sampling of the overburden soils and bedrock was accomplished ahead of the augers at the depths indicated on the boring logs, with a 2-inch-outside-diameter (O.D.) split-barrel sampler in general accordance with the procedures outlined by ASTM D1586, respectively. Standard Penetration Tests (SPTs) were performed with the split-barrel sampler to obtain the standard penetration resistance or N-value[2] of the sampled material. Each boring was extended into the bedrock by rock coring with an NQ rock core bit affixed to a double-tube core barrel in general accordance with the procedures outlined by ASTM D2113. Photographs of the recovered rock core samples are included in Appendix C.

[2] The standard penetration resistance, or N-value, is defined as the number of blows required to drive the split-barrel sampler 12 inches with a 140-pound hammer falling 30 inches. Since the split-barrel sampler is driven 18 inches or until refusal, the blows for the first 6 inches are for seating the sampler, and the number of blows for the final 12 inches is the N-value, which is reported as blows per foot (or bpf). Additionally, “refusal” of the split-barrel sampler occurs when the sampler is driven less than 6 inches with 50 blows of the hammer.

Observations for groundwater were made in the borings during drilling, before introducing core water for rock coring, at the completion of drilling, and before backfilling the boring holes.

An engineer from Geotechnology provided technical direction during field exploration, observed drilling and sampling, assisted in obtaining samples, and prepared field logs of the material encountered.

Representative portions of the split-barrel samples were placed in glass jars with lids to preserve the in-situ moisture contents of the samples. The recovered rock core samples were placed in waxed cardboard core boxes. The glass jars and core boxes were marked and labeled in the field for identification when returned to our laboratory.

6.0 LABORATORY REVIEW AND TESTING

Upon completion of the fieldwork, the samples recovered from the borings were transported to our Soil Mechanics Laboratory, where they were visually reviewed and classified by the Project Geotechnical Engineer.

Laboratory testing was performed on selected soil and rock samples to estimate engineering and index properties. Laboratory testing of the selected soil samples included various combinations of the following tests: moisture content, Atterberg limits, and gradation (particle-size) analyses. Moisture content testing and uniaxial compression testing were also performed on selected rock core samples. The results of these tests are summarized in the Tabulation of Laboratory Tests in Appendix D, along with the corresponding laboratory test forms. Additionally, the laboratory test results from the borings for the adjacent substation are included in Appendix D for ease of reference.

The boring logs, which are included in Appendix C, were prepared by the Project Geotechnical Engineer on the basis of the field logs, the visual classification of the soil and bedrock samples in the laboratory, and the laboratory test results. Soil and Rock Classification Sheets are also included in Appendix C, which describe the terms and symbols used on the boring logs. The dashed lines on the boring logs indicate an approximate change in strata as estimated between samples, whereas a solid line indicates that the change in strata occurred within a sample where a more precise measurement could be made. Furthermore, the transition between strata can be abrupt or gradual.

7.0 SUBSURFACE CONDITIONS

7.1 Stratification

Generally, the ground surface was underlain by topsoil, then fill, followed by lacustrine sands over glacial till, over the underlying shale and siltstone bedrock. More specific descriptions of the subsurface strata are provided below, and the boring logs containing detailed material descriptions are located in Appendix C. For reference, the boring logs from the adjacent

substation are also included in Appendix C; however, the discussions in the following sections only refer to the new borings (i.e., Borings B-101 through B-103).

7.1.1 Topsoil

Topsoil was encountered at the ground surface in Borings B-101 through B-103. The thickness of the topsoil in these borings varied from 5 to 15 inches.

7.1.2 Fill

Fill was encountered in Borings B-102 and B-103 beneath the topsoil and was 2.2 and 6.7 feet thick, respectively. The fill soils consisted of light to yellow brown loose to medium dense sand, poorly-graded gravel (sandstone fragments), or silty gravel (sandstone fragments) with varying quantities of sand and silty clay, and trace wood fragments. Based on the sandstone fragments, we anticipate that the fill in Boring B-103 was refuse material from the historic quarrying operations of the surrounding area. Table 1 summarizes the laboratory test results on fill samples, which included moisture contents and particle-size analyses.

Table 1. Summary of laboratory test results of the fill.

		Samples Tested	Minimum	Maximum
	Moisture Content (%)	7	5	12
Particle-Size Analysis	**Gravel-Sized (%)**	2	49	56
	Sand-Sized (%)		35	38
	Fines (%)		9	13

Notes:
[a] Fines are defined as material passing the No. 200 sieve and include silt- and clay-sized particles.

7.1.3 Lacustrine Soils

Lacustrine soils (or lakebed soils) are sedimentary soils deposited by lakes. According to Pavey et al. (1999), sand and gravel lacustrine soils were deposited as beach ridge deposits around proglacial lakes that were predecessors to Lake Erie. The lacustrine soils were encountered in Borings B-101 through B-103 to depths of 4 to 12.5 feet below existing grades. These soils were described as light brown or gray, very loose to medium dense sandy silt, silty clayey sand, or silty sand. Uncorrected SPT N-values in this stratum generally varied from 4 to 18 blows per foot (bpf). Table 2 summarizes the laboratory test results on lacustrine soil samples, which included moisture contents and particle-size analyses.

Table 2. Summary of laboratory test results of the lacustrine soils.

		Samples Tested	Minimum	Maximum
	Moisture Content (%)	8	6	30
Particle-Size Analysis	**Gravel-Sized (%)**	2	0	0
	Sand-Sized (%)		46	75
	Fines (%)		25	54

Notes:
[a] Fines are defined as material passing the No. 200 sieve and include silt- and clay-sized particles.

7.1.4 Glacial Soils

Glacial soils (or glacial till) are soils that have been deposited, transported, or reworked in place by the advancement or retreat of a glacier across the area. Glacial till was encountered in each of the borings either beneath the fill or the lacustrine soils at depths of 4 to 12.5 feet below existing grade and ranged from 3 to 27.8 feet thick. The glacial till was predominantly cohesive, except for a cohesionless layer of loose silty sand that was sandwiched between two layers of cohesive glacial till in Boring B-103 (between the approximate depths of 20 and 23 feet). The cohesive glacial till soils in these borings were generally described as gray, brown, and reddish brown, very stiff to hard lean clay with varying amounts of sand and gravel. Laboratory testing results on the glacial till are summarized in Table 3, while the laboratory test results and N-value of the cohesionless glacial till are summarized in Table 4.

Table 3. Summary of laboratory test results of the cohesive glacial till.

		Samples Tested	Minimum	Maximum
	Moisture Content (%)	14	8	18
Atterberg Limits	**Liquid Limit (%)**	4	25	39
	Plastic Limit (%)		15	22
	Plasticity Index (%)		10	17
Particle-Size Analysis	**Gravel-Sized (%)**	4	0	3
	Sand-Sized (%)		16	29
	Silt-Sized (%)		32	40
	Clay-Sized (%)		34	49

Table 4. Summary of particle-size analysis results and N-value of the cohesionless glacial till.

Boring No.	Sample No.	Depth (ft.)		N-value (bpf)	Gravel-sized (%)	Sand-sized (%)	Fines (%)[a]
		From	To				
B-103	SS-9B	20.4	21.5	9	6	76	18

Notes:
[a] Fines are defined as material passing the No. 200 sieve and include silt- and clay-sized particles.

7.1.5 Bedrock

The overburden soils at the site are underlain by bedrock consisting of interbedded shale and siltstone layers. Bedrock was encountered in each of the borings at depths ranging from 7 to 36.1 feet below the ground surface.

As discussed in Section 3.0, the bedrock underlying the overburden soils belongs to the Berea Sandstone and Bedford Shale, Undivided Formation; however, the bedrock encountered in Borings B-101 through B-103 generally appeared to consist of the Bedford Shale component. The bedrock was described as reddish brown and gray, extremely weak to weak, fissile shale and frequently interbedded with very weak to weak siltstone layers. Approximately 10 feet of bedrock was cored in each of the borings. The rock quality designation (RQD)[3] values ranged from 0 to 88 percent, and were approximately 40 percent on average (when weighted by the length of the core). Three samples of the rock core were subjected to uniaxial compression tests. The results of these tests are summarized in Table 5.

Table 5. Summary of uniaxial compressive strength tests on rock core specimens.

Boring No.	Sample No.	Depth (ft.)	Bedrock Component	Dry Unit Weight (pcf)	Uniaxial Compressive Strength (psi)
B-101	RC-10	20.9-21.4	Shale	139.4	76.3
B-103	RC-12	33.0-34.0	Siltstone	144.4	2,010
B-103	RC-13	39.7-40.4	Interbedded Shale and Siltstone	143.8	685

7.2 Groundwater Conditions

As mentioned in Section 5.0, groundwater observations were made in the borings during drilling, and at the completion of drilling before backfilling the boring holes. These measurements are documented on the boring logs in Appendix C and are summarized below in Table 6. In general,

[3] The rock quality designation (RQD) is defined as the percentage of rock core pieces recovered in lengths longer than 4 inches for the specified interval.

groundwater was encountered within the bedrock or as perched groundwater in the granular lacustrine soils overlying the cohesive glacial till.

Table 6. Summary of groundwater observations.

Boring	Elevation (feet)		
	Bottom of Boring	Water Level During Drilling[a]	Water Level Upon Completion[a]
B-101	663.5	NE	680 (Core water)
B-102	650.9	689.9	685 (Core water)
B-103	657.5	678.0	678 (Core water)

Notes:
[a] Abbreviation: NE = not encountered.

Based on the groundwater observations and our experience, groundwater seepage is anticipated along the interface between cohesionless and cohesive soils (e.g., between the cohesionless lacustrine and cohesive glacial till soils), along the soil/bedrock interface, and in the saturated zones of the native soils that are within perched groundwater zones. Locally concentrated flow may occur due to saturated layers of native soils (particularly the cohesionless lacustrine soils). Additionally, groundwater levels and seepage amounts are expected to vary with time, location, season of the year, amounts of precipitation.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Based on our engineering reconnaissance of the site, the borings, the visual examination of the recovered samples, the laboratory test results, our understanding of the proposed project, our engineering analyses, and our experience as Geotechnical Engineers in Ohio, we have reached the conclusions and make the following recommendations of this report.

8.1 Excavation Support

Excavation support should be the responsibility of the Contractor. Excavation support should be designed and implemented such that excavations are adequately ventilated and braced, shored, and/or sloped in order to protect and ensure the safety of workers within and near the excavations and to protect adjacent ground, slopes, structures, and infrastructure. Federal, state, and local safety regulations should be satisfied. The analyses, discussions, conclusions, and recommendations throughout this report are not to be interpreted as pre-engineering compliance with any safety regulation.

8.2 Seismic Site Classification

Based on the borings and our interpretation of the 2018 International Building Code (2018 IBC), it is our opinion that Site Class D is applicable for the monopoles.

8.3 Drilled Shaft Foundations for Monopoles

Axial resistance for the drilled shaft foundations for the monopoles may be provided by a combination of end resistance and side resistance. The idealized soil and bedrock profiles included in Appendix E provide the recommended values for allowable end and side resistance for the different subsurface layers. We recommend that drilled shafts bear at least 3 times the shaft diameter below the ground surface, where applicable.

For resistance to lateral and moment loads, the drilled shafts should be designed using a p-y approach. The idealized soil and bedrock profiles included in Appendix E provide the p-y parameters for LPile and MFAD (Moment Foundation Analysis Design) for the different subsurface layers. It is noted that a stiff clay model in LPile is recommended for certain layers of the weak bedrock where the uniaxial compressive strength is less than 100 psi.

Lateral resistance for deep foundations should be ignored above the frost line (i.e., above a depth of 42 inches from the ground surface).

The drilled shaft excavations should be made straight and plumb with level bottoms, using dry construction methods. Loose, soft, wet, or otherwise disturbed materials should be removed from the bearing surfaces to expose the design end bearing materials before the reinforcing steel and concrete are placed. Concrete should not be placed through more than 3 inches of water in the bottom of any shaft, and the rate of inflow of groundwater should be less than 12 inches per hour, unless wet construction methods are implemented. We recommend that each drilled shaft excavation be reviewed by the Project Geotechnical Engineer, or a representative thereof, to confirm that the soil and/or bedrock conditions encountered within the drilled shaft are consistent with those encountered in the borings and with the design recommendations of this report.

Due to some of the cohesionless granular soils, which also happened to be wet, full-depth temporary casing from the ground surface to the top of bedrock may be needed to control groundwater and/or caving overburden soils. We recommend that the Contract Documents include a bid item for casing shafts as recommended by the Project Geotechnical Engineer, or the representative thereof, on a “cost per cased shaft” basis.

9.0 RECOMMENDED ADDITIONAL SERVICES

The conclusions and recommendations given in this report are based on: Geotechnology’s understanding of the proposed design and construction, as outlined in this report; site observations; interpretation of the exploration data; and our experience. Since the intent of the design recommendations is best understood by Geotechnology, we recommend that Geotechnology be included in the final design and construction process, and be retained to review the project plans and specifications to confirm that the recommendations given in this report have been correctly implemented. We recommend that Geotechnology be retained to participate in prebid and preconstruction conferences to reduce the risk of misinterpretation of the conclusions and recommendations in this report relative to the proposed construction of the subject project.

Since actual subsurface conditions between boring locations may vary from those encountered in the borings, our design recommendations are subject to adjustment in the field based on the subsurface conditions encountered during construction. Therefore, we recommend that Geotechnology be retained to provide construction observation services as a continuation of the design process to confirm the recommendations in this report and to revise them accordingly to accommodate differing subsurface conditions. Construction observation is intended to enhance compliance with project plans and specifications. It is not insurance, nor does it constitute a warranty or guarantee of any type. Regardless of construction observation, contractors, suppliers, and others are solely responsible for the quality of their work and for adhering to plans and specifications.

10.0 LIMITATIONS

This report has been prepared on behalf of, and for the exclusive use of, Emerald Energy & Exploration Land Company for specific application to the named project as described herein. If this report is provided to other parties, it should be provided in its entirety with all supplementary information. In addition, Emerald Energy & Exploration Land Company should make it clear that the information is provided for factual data only, and not as a warranty of subsurface conditions presented in this report.

Geotechnology has attempted to conduct the services reported herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions. The recommendations and conclusions contained in this report are professional opinions. The report is not a bidding document and should not be used for that purpose.

Our scope for this phase of the project did not include any environmental assessment or investigation for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors noted or unusual or suspicious items or conditions observed are strictly for the information of our client. Our scope did not include an assessment of the effects of flooding and erosion of creeks or rivers adjacent to or on the project site.

The analyses, conclusions, and recommendations contained in this report are based on the data obtained from the subsurface exploration. The field exploration methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Consequently, subsurface conditions may vary gradually, abruptly, and/or nonlinearly between sample locations and/or intervals.

The conclusions or recommendations presented in this report should not be used without Geotechnology's review and assessment if the nature, design, or location of the facilities is changed, if there is a substantial lapse in time between the submittal of this report and the start of work at the site, or if there is a substantial interruption or delay during work at the site. If changes are contemplated or delays occur, Geotechnology must be allowed to review them to assess their

impact on the findings, conclusions, and/or design recommendations given in this report. Geotechnology will not be responsible for any claims, damages, or liability associated with any other party's interpretations of the subsurface data or with reuse of the subsurface data or engineering analyses in this report.

The recommendations included in this report have been based in part on assumptions about variations in site stratigraphy that may be evaluated further during earthwork and foundation construction. Geotechnology should be retained to perform construction observation and continue its geotechnical engineering service using observational methods. Geotechnology cannot assume liability for the adequacy of its recommendations when they are used in the field without Geotechnology being retained to observe construction.

A copy of "Important Information about This Geotechnical-Engineering Report" that is published by the Geotechnical Business Council (GBC) of the Geoprofessional Business Association (GBA) is included in Appendix A for your review. The publication discusses some other limitations, as well as ways to manage risk associated with subsurface conditions.

REFERENCES

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Pavey, R.R., Larsen, G.E., Swinford, E.M., Vorbau, K.E., and Cannon, M.E. (1999). “Surficial geology of the Lorain and Put-in-Bay 30 x 60 minute quadrangles”, Ohio Division of Geological Survey, Digital Map Series SG-2 Lorain and Put-in-Bay, scale 1:100,000.

Reese, L.C., Isenhower, W.M., and Wang, S.T. (2006). *Analysis and Design of Shallow and Deep Foundations*, John Wiley & Sons, Inc., Hoboken, New Jersey.

Shrake, D.L., Swinford, E.M., Schumacher, G.A., Larsen, G.E., and Slucher, E.R. (2011). “Descriptions of Geologic Map Units: A Compendium to Accompany Division of Geological Survey Open-File Bedrock Geology Maps”, Open-File Report 98-1, Ohio Department of Natural Resources, Division of Geological Survey.

APPENDIX A – IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

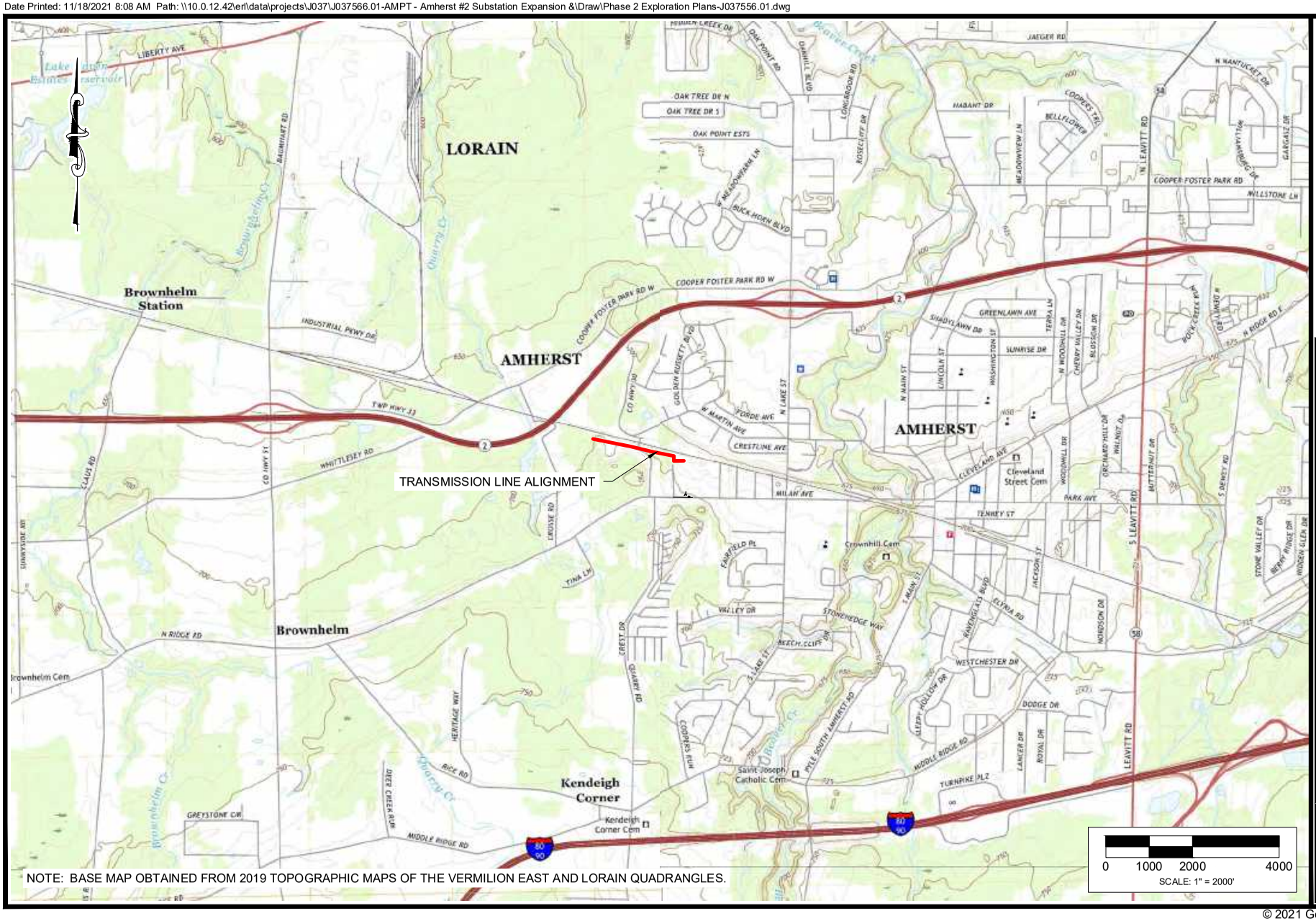
8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

APPENDIX B – PLANS

Transmission Line Site Location Plan, Sheet No. 101

Transmission Line Exploration Plans, Sheets No. 102 and 103

Date Printed: 11/18/2021 8:08 AM Path: \\10.0.12.42\erl\data\projects\J037\J037566.01-AMPT - Amherst #2 Substation Expansion &\Draw\Phase 2 Exploration Plans-J037556.01.dwg



NOTE: BASE MAP OBTAINED FROM 2019 TOPOGRAPHIC MAPS OF THE VERMILION EAST AND LORAIN QUADRANGLES.

GEOTECHNOLOGY

Project: AMPT- AMHERST #2
138 KV TRANSMISSION LINE

Location: AMHERST, OHIO

Title: TRANSMISSION LINE
SITE LOCATION PLAN

Client: EMERALD ENERGY
& EXPLORATION LAND COMPANY

Date: 11/18/2021
Project No.: J037566.01
Sheet No.: 101

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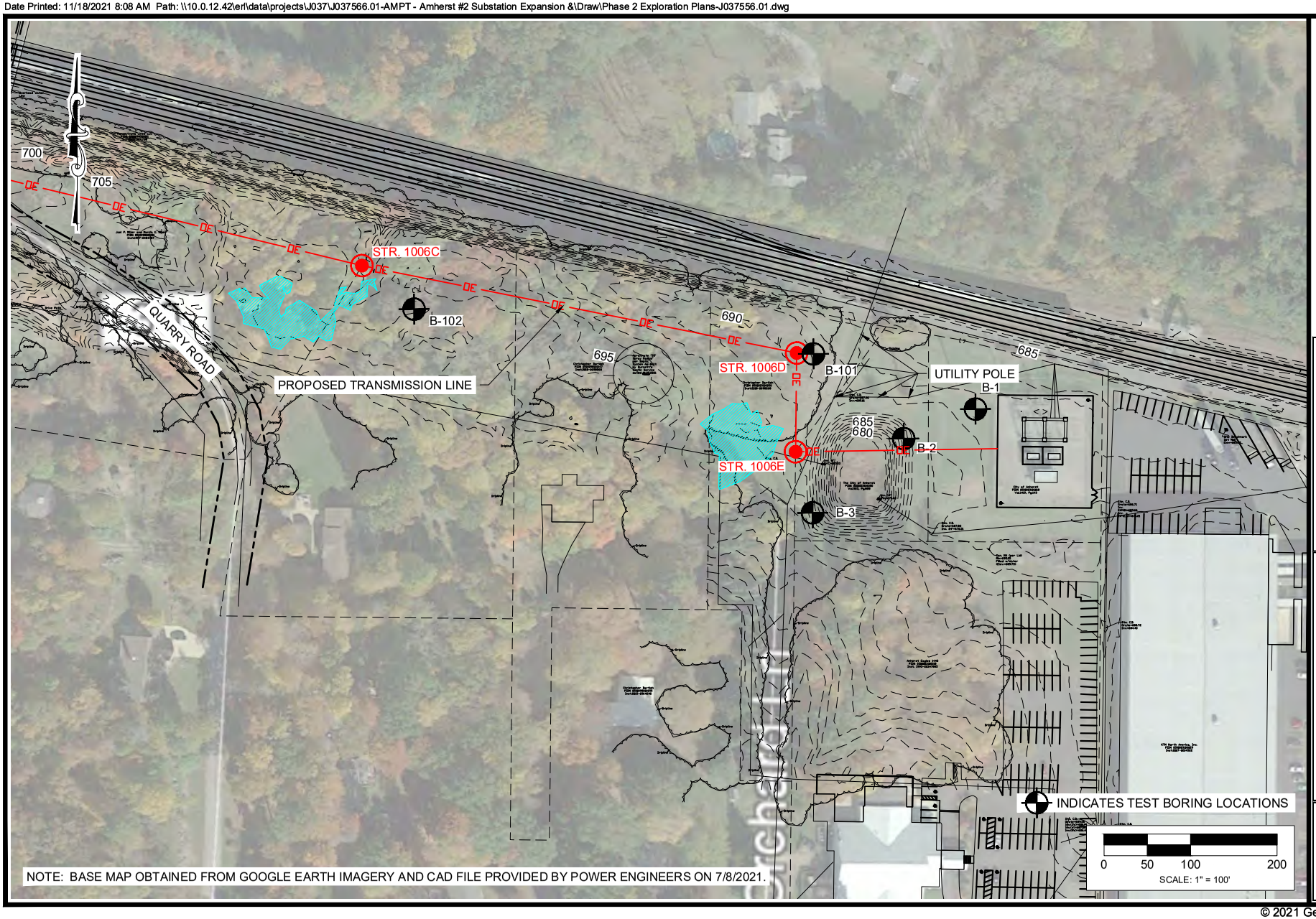

NOTE: BASE MAP OBTAINED FROM GOOGLE EARTH IMAGERY AND CAD FILE PROVIDED BY POWER ENGINEERS ON 7/8/2021.

GEOTECHNOLOGY

Project: AMPT- AMHERST #2 138 KV TRANSMISSION LINE

Location: AMHERST, OHIO

Title: TRANSMISSION LINE EXPLORATION PLAN

Client: EMERALD ENERGY & EXPLORATION LAND COMPANY

Date: 11/18/2021

Project No.: J037566.01

Sheet No.: 102

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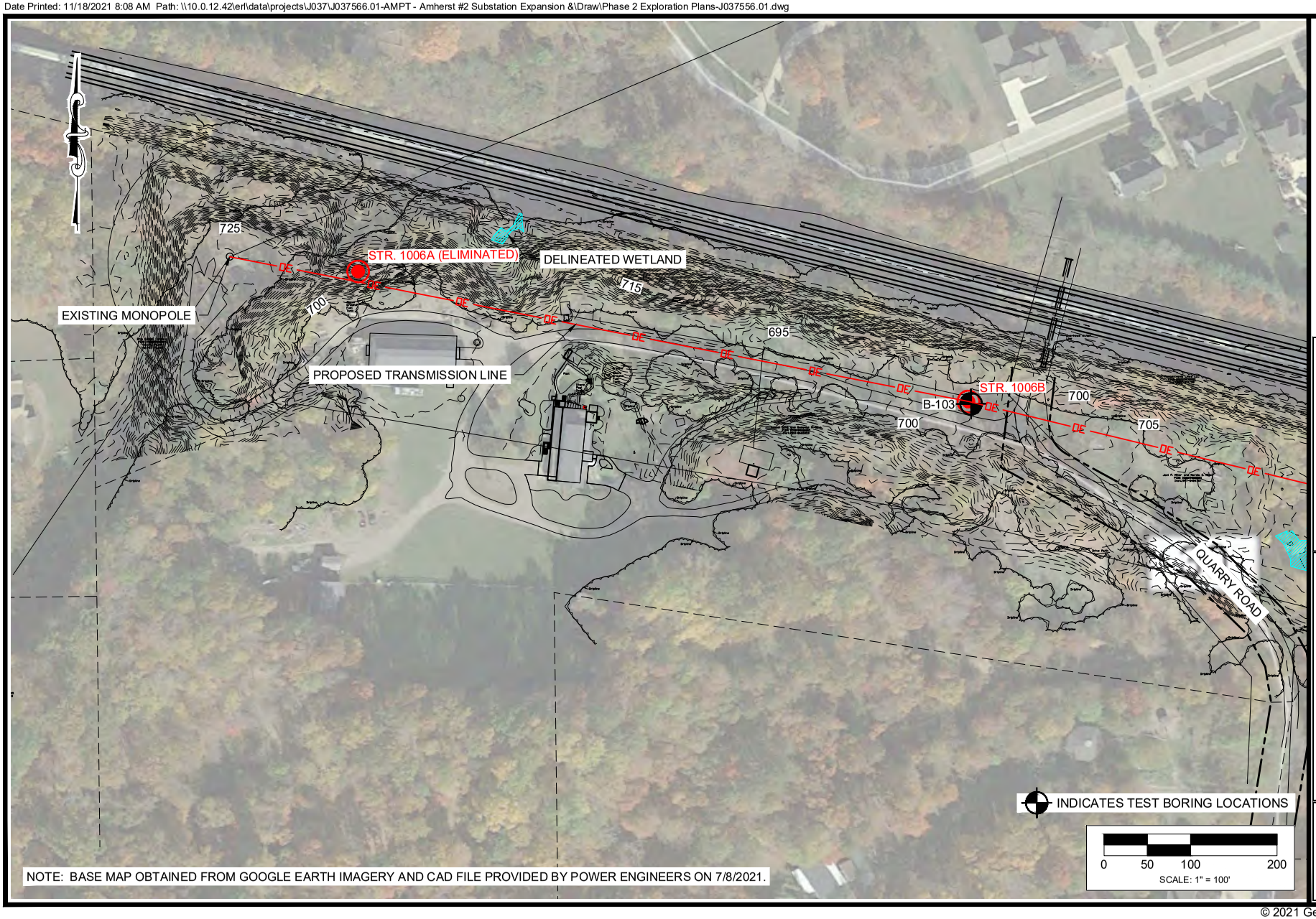

GEOTECHNOLOGY

Project: AMPT- AMHERST #2 138 KV TRANSMISSION LINE

Location: AMHERST, OHIO

Title: TRANSMISSION LINE EXPLORATION PLAN

Client: EMERALD ENERGY & EXPLORATION LAND COMPANY

Date: 11/18/2021

Project No.: J037566.01

Sheet No.: 103

APPENDIX C – BORING INFORMATION

Boring Logs from Phase II (Borings B-101 through B-103)

Boring Logs from Phase I (Borings B-1 through B-3)

Soil Classification Sheet

Rock Classification Sheet

Rock Core Photographs

GEOTECHNOLOGY
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LOG OF TEST BORING

CLIENT: Emerald Energy & Exploration Land
BORING #: B-101
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
PROJECT #: J037566.01
Amherst, Ohio
PAGE #: 1 of 1
LOCATION OF BORING: As shown on Exploration Plan.

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
688.5	Ground Surface	0.0	0							
687.3	TOPSOIL (15 INCHES)	1.3		I	1	SS	1-2-4	15	83	
	Light brown damp loose to medium dense sandy SILT (lacustrine) (ML).			I	2	SS	3-4-6	16	89	
684.5		4.0		I	3A 3B	SS	8-9-9	16	89	4.5+
	Mottled brown and gray damp very stiff to hard LEAN CLAY with sand (glacial till) (CL).		5	I	4	SS	4-5-6	18	100	4.5
681.5		7.0		I	5	SS	6-12-29	16	89	4.5
	Light brown to reddish brown damp to dry extremely weak fissile weathered arenaceous SHALE (bedrock).			D	6	SS	11-34-50/2"	17	100	
			10	D	7	SS	8-26-25	18	100	
677.0		11.5								
	Reddish brown damp extremely weak fissile SHALE (bedrock).			I	8	SS	11-23-30	18	100	
673.5		15.0	15							
	Reddish brown damp extremely weak fissile SHALE with thin bedding and occasional cross bedding (Berea Sandstone and Bedford Shale, Undivided) (bedrock).			I	9	RC	RQD=40%	33	55	
668.5		20.0	20							
	Reddish brown damp to dry extremely weak fissile SHALE with thin bedding and siltstone interbeds (Berea Sandstone and Bedford Shale, Undivided) (bedrock).			I	10	RC	RQD=88%	42	100	
	At 20.9' to 21.4', QU = 76.3 psi			I	11	RC	RQD=0%	18	100	
663.5		25.0	25							
	Bottom of test boring at 25.0 feet.		30							

Datum: NAVD 88
Hammer Weight: 140 lb.
Hole Diameter: 8 in.
Drill Rig: Mobile B57
Surface Elevation: 688.5 ft. +/-
Hammer Drop: 30 in.
Rock Core Diameter: 1.875 in.
Foreman: A. Ungeerzat
Date Started: 10/21/2021
Pipe Size: 2 in. O.D.
Boring Method: HSA-3.25
Engineer: Andrew S. Dingler
Date Completed: 10/21/2021

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: None
At Completion: Core Water at 8.5 ft.
After: --
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY
A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: Emerald Energy & Exploration Land
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
Amherst, Ohio
LOCATION OF BORING: As shown on Exploration Plan.

BORING #: B-102
PROJECT #: J037566.01
PAGE #: 1 of 2

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
697.4	Ground Surface	0.0	0							
697.0	TOPSOIL (5 INCHES)	0.4		I	1	SS	2-3-3	18	100	
694.8	Light brown damp loose to medium dense SAND, trace wood fragments (fill).	2.6		I	2	SS	3-5-7	18	100	
691.4	Brown and reddish brown moist medium dense to loose silty clayey SAND (lacustrine) (SC-SM).	6.0		I	3	SS	3-8-10	18	100	
689.9	Brown and reddish brown moist very loose silty SAND (lacustrine).	7.5	5	I	4	SS	4-6-4	18	100	
689.1	Dark gray wet very loose silty clayey SAND (lacustrine)	8.3		I	5	SS	3-2-2	10	56	
	Reddish brown, trace gray moist very stiff sandy LEAN CLAY with gravel (glacial till) (CL).			I	6A 6B	SS	1-3-6	18	100	3.0
			10	I	7	SS	4-7-9	18	100	3.5
				I	8	SS	11-17-19	18	100	4.5
			15	I	9	SS	8-14-19	18	100	4.5+
			20	I	10	SS	10-17-25	18	100	4.5
674.9	Gray damp very stiff to hard LEAN CLAY with sand (glacial till) (CL).	22.5	25							

Datum: NAVD 88
Surface Elevation: 697.4 ft. +/-
Date Started: 10/22/2021
Date Completed: 10/22/2021

Hammer Weight: 140 lb.
Hammer Drop: 30 in.
Pipe Size: 2 in. O.D.

Hole Diameter: 8 in.
Rock Core Diameter: 1.875 in.
Boring Method: HSA-3.25

Drill Rig: Mobile B57
Foreman: A. Ungeerzat
Engineer: Andrew S. Dingler

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH

First Noted	Trace at 7.5 ft.
At Completion	Core Water at 12.4 ft.
After	--
Backfilled	Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY
A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: Emerald Energy & Exploration Land
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
Amherst, Ohio
LOCATION OF BORING: As shown on Exploration Plan.

BORING #: B-102
PROJECT #: J037566.01
PAGE #: 2 of 2

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
	Gray damp very stiff to hard LEAN CLAY with sand (glacial till) (CL).		25	I	11	SS	8-20-30	18	100	4.5
			30	I	12	SS	5-18-20	18	100	4.5
			35	I	13	SS	8-13-50/4"	18	100	4.5
661.3		36.1								
660.9	Reddish brown dry extremely weak fissile weathered SHALE (bedrock).	36.5								
	Reddish brown damp extremely weak fissile weathered SHALE with thin to medium planar bedding and siltstone interbeds (Berea Sandstone and Beford Shale, Undivided) (bedrock).			I	14	RC	RQD=0%	52	87	
657.9		39.5	40							
	Gray damp to dry extremely weak fissile weathered SHALE with thin to medium planar bedding and siltstone interbeds (Berea Sandstone and Bedford Shale, Undivided) (bedrock).			I	15	RC	RQD=0%	46	77	
650.9		46.5	45							
	Bottom of test boring at 46.5 feet.		50							

Datum: NAVD 88
Surface Elevation: 697.4 ft. +/-
Date Started: 10/22/2021
Date Completed: 10/22/2021

Hammer Weight: 140 lb.
Hammer Drop: 30 in.
Pipe Size: 2 in. O.D.

Hole Diameter: 8 in.
Rock Core Diameter: 1.875 in.
Boring Method: HSA-3.25

Drill Rig: Mobile B57
Foreman: A. Ungeerzat
Engineer: Andrew S. Dingler

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH

First Noted	Trace at 7.5 ft.
At Completion	Core Water at 12.4 ft.
After	--
Backfilled	Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY
A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: Emerald Energy & Exploration Land
BORING #: B-103
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
PROJECT #: J037566.01
Amherst, Ohio
PAGE #: 1 of 2
LOCATION OF BORING: As shown on Exploration Plan.

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
698.0	Ground Surface	0.0	0							
697.2	TOPSOIL (9 INCHES)	0.8		I	1	SS	3-6-4	18	100	
	Light to yellow brown damp loose to medium dense poorly graded GRAVEL/SANDSTONE FRAGMENTS with sand and silty clay (fill) (GP-GM).			I	2	SS	3-2-4	16	89	
	Note: Sand seams were noted from 3.0 to 4.5 and from 5.7 to 6.0.			I	3	SS	5-7-7	15	83	
			5	I	4	SS	5-5-6	18	100	
692.0		6.0								
	Light brown medium dense silty GRAVEL/SANDSTONE FRAGMENTS with sand (fill) (GM).			I	5	SS	9-12-16	16	89	
690.5		7.5								
	Brown moist loose silty clayey SAND with rounded to sub-rounded gravel dropstones (lacustrine).			I	6	SS	5-3-4	17	94	
			10	I	7	SS	2-4-4	15	83	
685.5		12.5								
	Gray damp very stiff to hard LEAN CLAY with sand and shale fragments (glacial till) (CL).		15	I	8	SS	3-4-6	18	100	4.5+
677.6		20.4	20							
	Gray moist loose silty SAND, trace fine gravel (glacial till) (SM).			I	9A 9B	SS	5-5-4	16	89	2.75
675.0		23.0								
	Reddish brown and gray damp very stiff to hard LEAN CLAY with sand, trace gravel (glacial till).		25							

Datum: NAVD 88
Hammer Weight: 140 lb.
Hole Diameter: 6 in.
Drill Rig: Mobile B57
Surface Elevation: 698.0 ft. +/-
Hammer Drop: 30 in.
Rock Core Diameter: 1.875 in.
Foreman: A. Ungeerzat
Date Started: 10/22/2021
Pipe Size: 2 in. O.D.
Boring Method: HSA-3.25
Engineer: Andrew S. Dingler
Date Completed: 10/22/2021

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH

First Noted	20 ft.
At Completion	Core Water at 20 ft.
After	--
Backfilled	Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY
A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: Emerald Energy & Exploration Land
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
Amherst, Ohio
LOCATION OF BORING: As shown on Exploration Plan.

BORING #: B-103
PROJECT #: J037566.01
PAGE #: 2 of 2

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
672.0		26.0	25	I	10A 10B	SS	5-28-50/1"	18	100	4.5+
	Gray damp to dry extremely weak to very weak highly fissile SHALE with siltstone interbeds (bedrock).									
667.5		30.5	30	I	11	SS	50/4"	4	100	
	Interbedded dark gray dry very weak thin to medium planarly bedded unweathered SHALE and SILTSTONE. High angle joints at 31.15' and 31.6' and a vertical fracture form 35.0' to 35.5' with clay partings and seams throughout the interval (Berea Sandstone and Bedford Shale, Undivided). At 33.0' to 34.0', QU = 2,010 psi			D	12	RC	RQD=56%	52	87	
662.5		35.5	35							
	Interbedded gray dry very weak to weak thin to medium planarly bedded unweathered SHALE and SILTSTONE with a clay seam from 36.1' to 36.25'. Core crushed from 37.0' to 37.4' and vertical fractures from 37.6' to 39.7' (Berea Siltstone and Bedford Shale, Undivided). At 39.7' to 40.4', QU = 685 psi			I	13	RC	RQD=58%	58	97	
657.5		40.5	40							
	Bottom of test boring at 40.5 feet.		45							
			50							

Datum: NAVD 88
Surface Elevation: 698.0 ft. +/-
Date Started: 10/22/2021
Date Completed: 10/22/2021

Hammer Weight: 140 lb.
Hammer Drop: 30 in.
Pipe Size: 2 in. O.D.

Hole Diameter: 6 in.
Rock Core Diameter: 1.875 in.
Boring Method: HSA-3.25

Drill Rig: Mobile B57
Foreman: A. Ungeerzat
Engineer: Andrew S. Dingler

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH

First Noted	20 ft.
At Completion	Core Water at 20 ft.
After	--
Backfilled	Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY
A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: Emerald Energy & Exploration Land Company
BORING #: B-1
PROJECT: AMPT - Amherst #2 Substation Expansion
PROJECT #: J037566.01
Amherst, Ohio
PAGE #: 1 of 1
LOCATION OF BORING: As shown on Substation Exploration Plan

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
687.5	Ground Surface	0.0	0							
687.0	TOPSOIL (6 inches)	0.5		I	1	SS	2-9-6	13	72	
684.5	Brown moist medium dense silty SAND (lacustrine).	3.0		I	2	SS	3-3-3	13	72	
				I	3	SS	2-2-3	13	72	
681.5	Brown and gray moist loose to very loose silty SAND (lacustrine).	6.0	5	I	4	SS	2-2-1	13	72	
				I	5	SS	1-4-7	16	89	2.0
678.5	Gray and brown and reddish brown moist stiff to hard LEAN CLAY with sand, trace gravel (glacial till) (CL).	9.0		I	6	SS	3-8-13	18	100	>4.5
675.0	Brown and gray moist very stiff to hard LEAN CLAY with relict bedding (residuum).	12.5	10	I	7	SS	10-17-14	11	61	
670.0	Reddish brown moist extremely weak weathered fissile SHALE with siltstone interbeds (bedrock).	17.5	15	I	8	SS	21-50/1"	5	71	
662.5	Gray slightly moist extremely weak fissile SHALE (bedrock).	25.0	20	I	9	SS	36-50/1"	6	86	
658.9	Interbedded gray slightly moist extremely weak SILTSTONE and SHALE, thinly laminated, medium bedded, fissile (Berea Sandstone and Bedford Shale, Undivided) (bedrock).	28.6	25	I	10	RC	RQD=74%	59	98	
652.5	Interbedded reddish brown slightly moist extremely weak SHALE and SILTSTONE, thinly laminated, thin bedded, fissile (Berea Sandstone and Bedford Shale, Undivided) (bedrock).	35.0	30	I	11	RC	RQD=45%	60	100	
	Bottom of test boring at 35.0 feet.		35							
			40							

Datum: NAVD 88
Hammer Weight: 140 lb.
Hole Diameter: 8 in.
Drill Rig: Mobile B57
Surface Elevation: 687.5 ft. +/-
Hammer Drop: 30 in.
Rock Core Diameter: 1.875 in.
Foreman: A. Unverzagt
Date Started: 5/13/2021
Pipe Size: 2 in. O.D.
Boring Method: HSA-3.25
Engineer: Andrew S. Dingler
Date Completed: 5/13/2021

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: Trace @ 4.5 ft., 15.0 ft.
At Completion: Core Water 10.5 ft., Caved @
After:
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

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LOG OF TEST BORING

CLIENT: Emerald Energy & Exploration Land Company
BORING #: B-2
PROJECT: AMPT - Amherst #2 Substation Expansion
PROJECT #: J037566.01
Amherst, Ohio
PAGE #: 1 of 1
LOCATION OF BORING: As shown on Substation Exploration Plan

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
686.0	Ground Surface	0.0	0							
685.5	TOPSOIL (6 inches)	0.5		I	1	SS	2-3-3	14	78	
	Brown moist loose silty SAND (lacustrine).			I	2	SS	2-3-2	13	72	
683.0		3.0								
682.0	Grayish brown wet loose silty SAND with soft clay layers (lacustrine).	4.0		I	3A 3B	SS	2-4-3	15	83	>4.5
	Gray moist very stiff LEAN CLAY with sand, trace gravel (glacial till) (CL).		5	I	4	ST		13	72	3.25
679.5		6.5								
	Gray and reddish brown slightly moist extremely weak weathered SHALE (bedrock).			I	5	SS	11-26-50/5"	16	94	
				I	6	SS	22-50/2	8	44	
676.0		10.0	10							
	Brown and gray moist extremely weak weathered SHALE, thinly laminated fissile (Berea Sandstone and Bedford Shale, Undivided).			I	7	RC	RQD=78%	55	92	
671.0		15.0	15							
	Gray moist extremely weak SHALE and gray slightly moist very weak SILTSTONE (Berea Sandstone and Bedford Shale, Undivided) (bedrock).			I	8	RC	RQD=65%	60	100	
666.0		20.0	20							
	Bottom of test boring at 20.0 feet.		25							
			30							

Datum: NAVD 88
Hammer Weight: 140 lb.
Hole Diameter: 8 in.
Drill Rig: Mobile B57
Surface Elevation: 686.0 ft. +/-
Hammer Drop: 30 in.
Rock Core Diameter: 1.875 in.
Foreman: A. Unverzagt
Date Started: 5/13/2021
Pipe Size: 2 in. O.D.
Boring Method: HSA-3.25
Engineer: Andrew S. Dingler
Date Completed: 5/13/2021

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH

First Noted	Trace @ 3.0 ft.
At Completion	Core Water
After	13 hrs. 9.1 ft.
Backfilled	13 hrs.

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY
A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: Emerald Energy & Exploration Land Company
BORING #: B-3
PROJECT: AMPT - Amherst #2 Substation Expansion
PROJECT #: J037566.01
Amherst, Ohio
PAGE #: 1 of 1
LOCATION OF BORING: As shown on Substation Exploration Plan

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
689.0	Ground Surface	0.0	0							
688.8	TOPSOIL (2 inches)	0.2		I	1	SS	1-2-4	17	94	3.0
686.5	Grayish brown moist very stiff LEAN CLAY with sand, trace gravel (glacial till) (CL).	2.5		I	2	ST		19	79	2.75
684.0	Brown and gray very stiff to hard LEAN CLAY, trace bedding (residuum).	5.0		I	3	SS	8-12-50/2"	7	50	>4.5
			5	I	4	SS	17-28-50/4"	16	100	
681.0	Gray and reddish brown moist extremely weak fissile weathered SHALE (bedrock).	8.0		I	5	SS	14-32-50/2"	10	71	
679.2	Reddish brown moist extremely weak fissile weathered SHALE (bedrock)	9.8		I	6	SS	19-50/5"	10	91	
678.8	Gray moist extremely weak weathered SHALE, fissile (Berea Sandstone and Bedford Shale, Undivided) (bedrock).	10.3	10							
674.0	Reddish brown moist extremely weak weathered SHALE, fissile (Berea Sandstone and Bedford Shale, Undivided) (bedrock).	15.0		I	7	RC	RQD=92%	39	65	
669.0	Reddish brown moist extremely weak weathered SHALE, fissile (Berea Sandstone and Bedford Shale, Undivided) (bedrock).	20.0	15	I	8	RC	RQD=58%	47	78	
	Bottom of test boring at 20.0 feet.		20							
			25							
			30							

Datum: NAVD 88
Hammer Weight: 140 lb.
Hole Diameter: 8 in.
Drill Rig: Mobile B57
Surface Elevation: 689.0 ft. +/-
Hammer Drop: 30 in.
Rock Core Diameter: 1.875 in.
Foreman: A. Unverzagt
Date Started: 5/14/2021
Pipe Size: 2 in. O.D.
Boring Method: HSA-3.25
Engineer: Andrew S. Dingler
Date Completed: 5/14/2021

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: Core Water
At Completion: Core Water @ 8.5 ft.
After:
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY
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SOIL CLASSIFICATION SHEET

NON COHESIVE SOILS
(Silt, Sand, Gravel and Combinations)

Density

Very Loose	- 4 blows/ft. or less
Loose	- 5 to 10 blows/ft.
Medium Dense	- 11 to 30 blows/ft.
Dense	- 31 to 50 blows/ft.
Very Dense	- 51 blows/ft. or more

Relative Properties

Descriptive Term	Percent
Trace	1 – 10
Little	11 – 20
Some	21 – 35
And	36 – 50

Particle Size Identification

Boulders	- 8 inch diameter or more	
Cobbles	- 3 to 8 inch diameter	
Gravel	- Coarse	- 3/4 to 3 inches
	- Fine	- 3/16 to 3/4 inches
Sand	- Coarse	- 2mm to 5mm (dia. of pencil lead)
	- Medium	- 0.45mm to 2mm (dia. of broom straw)
	- Fine	- 0.075mm to 0.45mm (dia. of human hair)
Silt		- 0.005mm to 0.075mm (Cannot see particles)

COHESIVE SOILS
(Clay, Silt and Combinations)

Consistency	Field Identification	Unconfined Compressive Strength (tons/sq. ft.)
Very Soft	Easily penetrated several inches by fist	Less than 0.25
Soft	Easily penetrated several inches by thumb	0.25 – 0.5
Medium Stiff	Can be penetrated several inches by thumb with moderate effort	0.5 – 1.0
Stiff	Readily indented by thumb but penetrated only with great effort	1.0 – 2.0
Very Stiff	Readily indented by thumbnail	2.0 – 4.0
Hard	Indented with difficulty by thumbnail	Over 4.0

Classification on logs are made by visual inspection.

Standard Penetration Test – Driving a 2.0" O.D., 1 3/8" I.D., sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the tests are recorded for each 6 inches of penetration on the drill log (Example – 6/8/9). The standard penetration test results can be obtained by adding the last two figures (i.e. 8+9=17 blows/ft.). Refusal is defined as greater than 50 blows for 6 inches or less penetration.

Strata Changes – In the column "Soil Descriptions" on the drill log, the horizontal lines represent strata changes. A solid line (————) represents an actually observed change; a dashed line (— — — —) represents an estimated change.

Groundwater observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., may cause changes in the water levels indicated on the logs.

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ROCK CLASSIFICATION SHEET

ROCK WEATHERING

Descriptions	Field Identification
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than it its fresh condition.
Highly Weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Residual Soil	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact with bedding planes visible, and the soil has not been significantly transported.

ROCK STRENGTH

Descriptions	Field Identification	Uniaxial Compressive Strength (psi)
Extremely Weak	Indented by thumbnail	40-150
Very Weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife.	150-700
Weak	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer.	700-4,000
Medium Strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with a single blow of a geological hammer.	4,000-7,000
Strong	Specimen requires more than one blow of a geological hammer to fracture.	7,000-15,000
Very Strong	Specimen requires many blows with a geological hammer to fracture.	15,000-36,000
Extremely Strong	Specimen can only be chipped with geological hammer.	>36,000

BEDDING

Descriptive Term	Bed Thickness
Massive	> 4 ft.
Thick	2 to 4 ft.
Medium	2 in. to 2 ft.
Thin	< 2 in.

Rock Core Photograph 1. Boring B-101, Core Runs RC-9, RC-10, and RC-11 (15 to 25 feet deep).

Rock Core Photograph 2. Boring B-102, Core Runs RC-14 and RC-15 (36.5 to 46.5 feet deep).

Rock Core Photograph 3. Boring B-103, Core Runs RC-12 and RC-13 (30.5 to 40.5 feet deep).

APPENDIX D – LABORATORY TEST DATA

Tabulation of Laboratory Tests

Particle-Size Analysis Test Forms

Standard Proctor Test Form

Soil Unconfined Compressive Strength Test Forms

Rock Uniaxial Compressive Strength Test Forms

GEOTECHNOLOGY
A Universal Engineering Sciences Company

AMPT - AMHERST #2
138 KV TRANSMISSION LINE
AMHERST, OHIO
J037566.01

TABULATION OF LABORATORY TESTS

Boring No.	Sample No.	Depth (ft.) From	Depth (ft.) To	Moisture Content (%)	Dry Unit Weight	Atterberg Limits (%) LL	PL	PI	Gradation Analysis (%) Gravel	Sand	Silt & Clay	USCS Classification	Uniaxial Compressive Strength (psi)	Standard Proctor Maximum Dry Density (pcf)	Standard Proctor Optimum Moisture Content (%)
B-101	SS-2	1.5	3.0	12.8					0.0	46.2	53.8	ML			
B-101	SS-3A	3.0	4.0	8.1											
B-101	SS-3B	4.0	4.5	18.0											
B-101	SS-4	4.5	6.0	18.1		39	22	17	0.7	20.9	31.6	46.8	CL			
B-101	SS-5A	6.0	7.0	15.9											
B-101	SS-5B	7.0	7.5	8.4											
B-101	SS-6	7.5	9.0	9.3											
B-101	SS-7	9.0	10.5	6.3											
B-101	SS-8	12.5	14.0	8.7											
B-101	RC-10	20.9	21.4	6.7	139.4								76.3		
B-102	SS-1	0.0	1.5	8.8											
B-102	SS-2	1.5	3.0	7.9											
B-102	SS-3	3.0	4.5	12.2											
B-102	SS-4	4.5	6.0	6.3					0.0	74.9	25.1	SC-SM			
B-102	SS-5	6.0	7.5	14.9											
B-102	SS-6A	7.5	8.3	29.5											
B-102	SS-6B	8.3	9.0	12.0											
B-102	SS-7	9.0	10.5	11.2		34	20	14	3.4	16.2	40.1	40.3	CL		
B-102	SS-8	12.5	14.0	9.5											
B-102	SS-9	15.0	16.5	8.6											
B-102	SS-10	20.0	21.5	7.9											
B-102	SS-11	25.0	26.5	10.5		25	15	10	0.9	28.8	36.6	33.7	CL		
B-102	SS-12	30.0	31.5	10.0											
B-102	SS-13A	35.0	36.1	10.3											
B-102	SS-13B	36.1	36.5	6.9											
B-103	SS-1B	0.8	1.5	8.3											
B-103	SS-2	1.5	3.0	12.3					55.5	35.2	9.3	GP-GM			
B-103	SS-3	3.0	4.5	8.8											
B-103	SS-4	4.5	6.0	5.8											
B-103	SS-5	6.0	7.5	5.5					48.9	38.3	12.8	GM			
B-103	SS-6	7.5	9.0	7.2											
B-103	SS-7	9.0	10.5	10.5											
B-103	SS-8	15.0	16.5	14.5		30	18	12	0.3	15.6	35.3	48.8	CL		
B-103	SS-9A	20.0	20.4	14.1											
B-103	SS-9B	20.4	21.5	16.8					5.5	76.3	18.2	SM			

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AMPT - AMHERST #2
138 KV TRANSMISSION LINE
AMHERST, OHIO
J037566.01

TABULATION OF LABORATORY TESTS

Boring No.	Sample No.	Depth (ft.) From	Depth (ft.) To	Moisture Content (%)	Dry Unit Weight	Atterberg Limits (%) LL	PL	PI	Gradation Analysis (%) Gravel	Sand	Silt & Clay		USCS Classification	Uniaxial Compressive Strength (psi)	Standard Proctor Maximum Dry Density (pcf)	Standard Proctor Optimum Moisture Content (%)
B-103	SS-10A	25.0	26.0	13.6												
B-103	SS-10B	26.0	26.5	21.2												
B-103	SS-11	30.0	31.5	6.3												
B-103	RC-12	33.0	34.0	4.3	144.4									2,010		
B-103	RC-13	39.7	40.4	5.7	143.8									685		
B-1	SS-1	0	1.5	9.5												
B-1	SS-2	1.5	3.0	17.2					0.3	71.8	27.9					
B-1	SS-3	3.0	4.5	0.7					1.4	49.8	48.8					
B-1	SS-4	4.5	6.0	21.5												
B-1	SS-5	6.0	7.5	20.9		36	22	14	2.8	27.9	29.7	39.6	CL			
B-1	SS-6	7.5	9.0	13.1												
B-1	SS-7	9.0	10.5	7.7												
B-1	SS-8	14.0	15.5	1.7												
B-1	SS-9	19.0	20.5	4.3												
B-1	RC-10	26.2	27.8	5.3	143.9									131		
B-2	SS-1	0.0	1.5	18.2												
B-2	SS-2	1.5	3.0	13.9					7.3	61.3	31.4					
B-2	SS-3B	4.0	4.5	17.4					4.3	25.4	70.3					
B-2	ST-4A	4.5	4.7	17.9		35	21	14	2.7	21.9	75.4		CL			
B-2	ST-4B	4.9	5.6	13.7	125.5											
B-2	SS-5	6.5	8.0	2.1												
B-2	SS-6	8.0	9.5	4.4												
B-2	RC-8	18.4	19.0	4.1	153.3									345		
B-3	SS-1	0.0	1.5	21.4												
B-3	BULK	0.2	5.0	20.8		29	19	10					CL		116.5	14.4
B-3	ST-2A	1.5	1.8	11.0		30	19	11	0.0	11.4	64.1	24.5	CL			
B-3	ST-2B	1.9	2.5	12.3	120.3											
B-3	SS-3	3.5	5.0	11.2												
B-3	SS-4	5.0	6.5	4.3												
B-3	SS-5	6.5	8.0	4.8												
B-3	SS-6	8.0	9.5	5.0												
B-3	RC-7	12.0	12.5	9.0	134.8									32		
B-3	RC-8	16.6	17.4	6.7	142.4									31		

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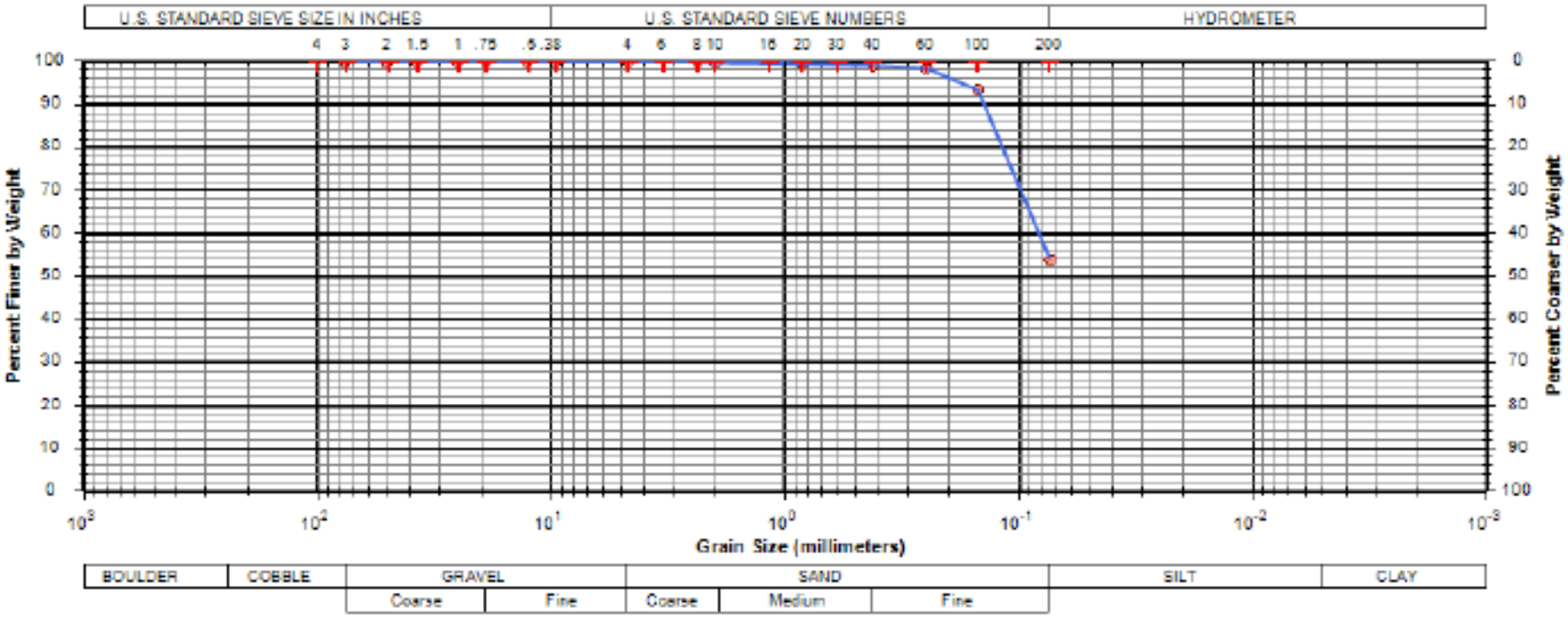
PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company							**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH							**Date:**	11/05/2021
Boring No.:	B-101	**Sample No.:**	SS-2	**Depth (ft.):**	1.5	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**	**USCS**
Sample Description:	Light brown sandy SILT (lacustrine).					0.0	46.2	53.8	ML
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
										12.8



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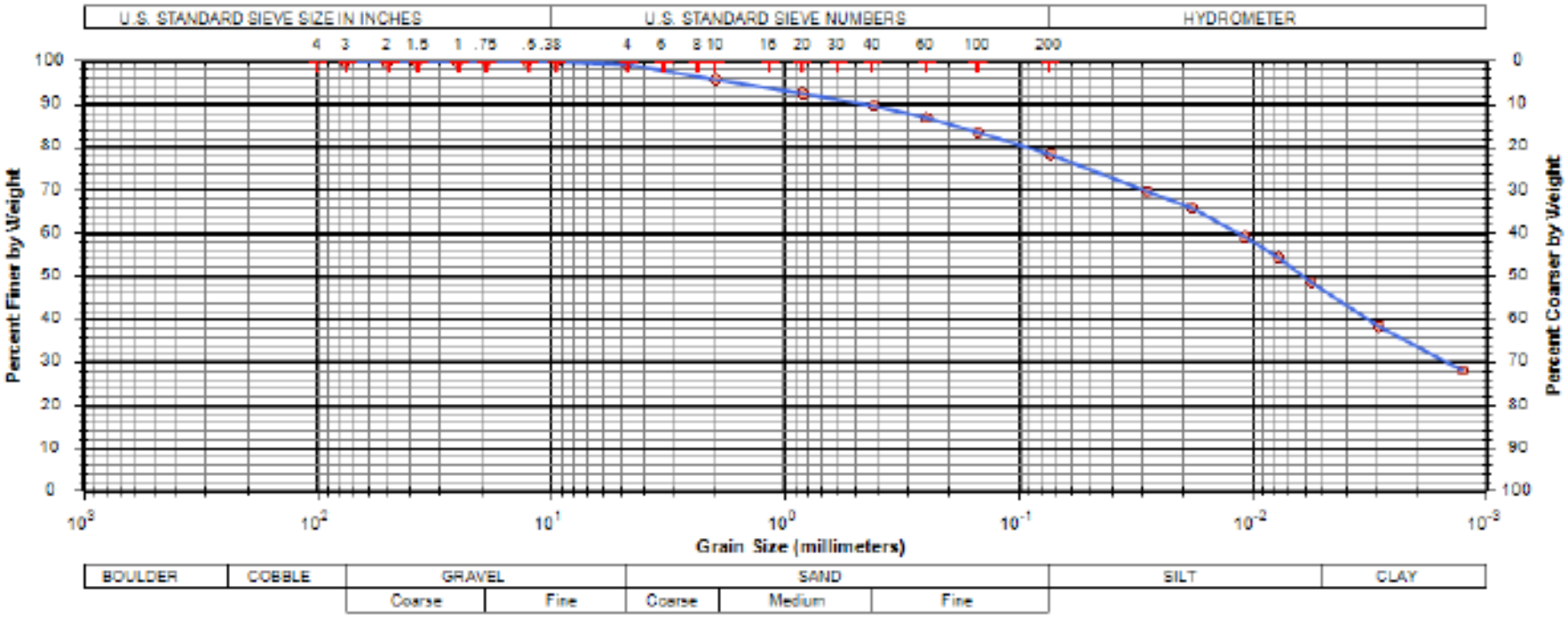
PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	11/05/2021
Boring No.:	B-101	**Sample No.:**	SS-4	**Depth (ft.):**	4.5	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Mottled brown and gray LEAN CLAY with sand (glacial till).					0.7	20.9	31.6	46.8	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						39	22	17		18.1



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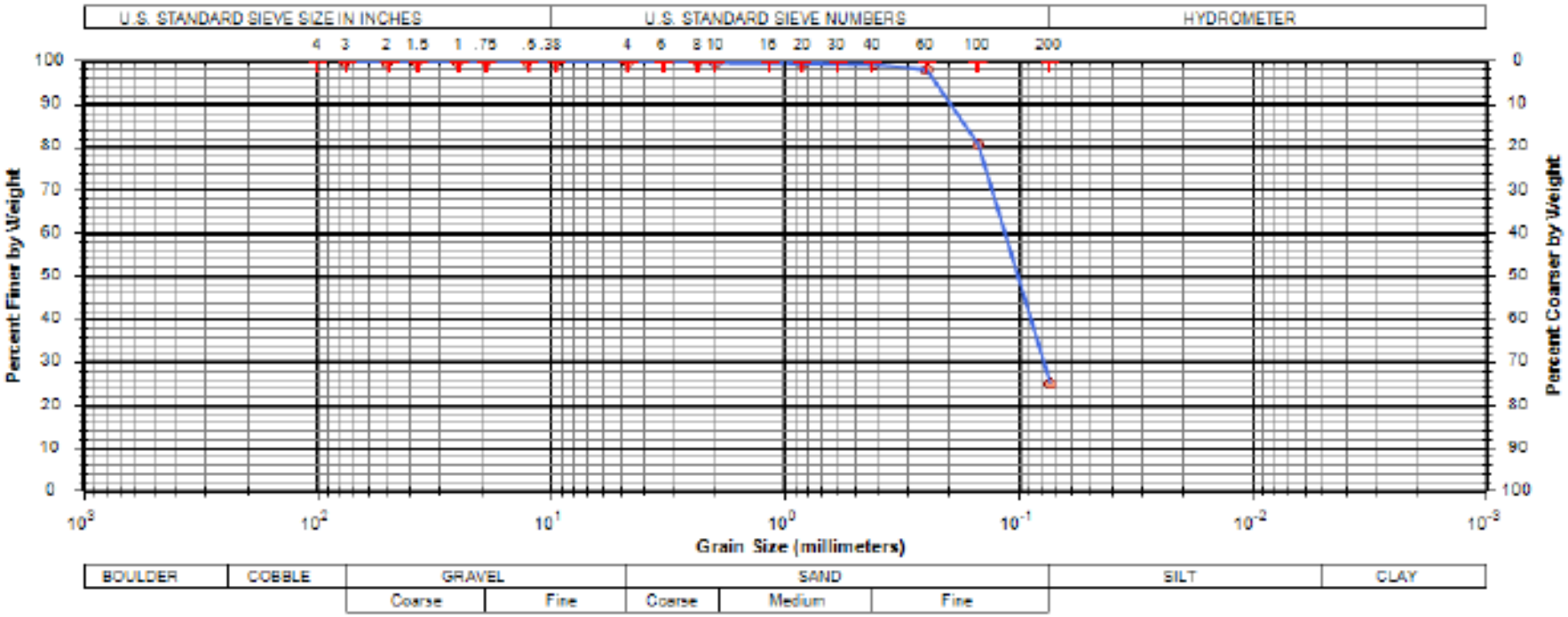
PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	11/05/2021
Boring No.:	B-102	**Sample No.:**	SS-4	**Depth (ft.):**	4.5	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**		**USCS**
Sample Description:	Brown to reddish brown silty clayey SAND (lacustrine).					0.0	74.9	25.1		SC-SM
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
										6.3



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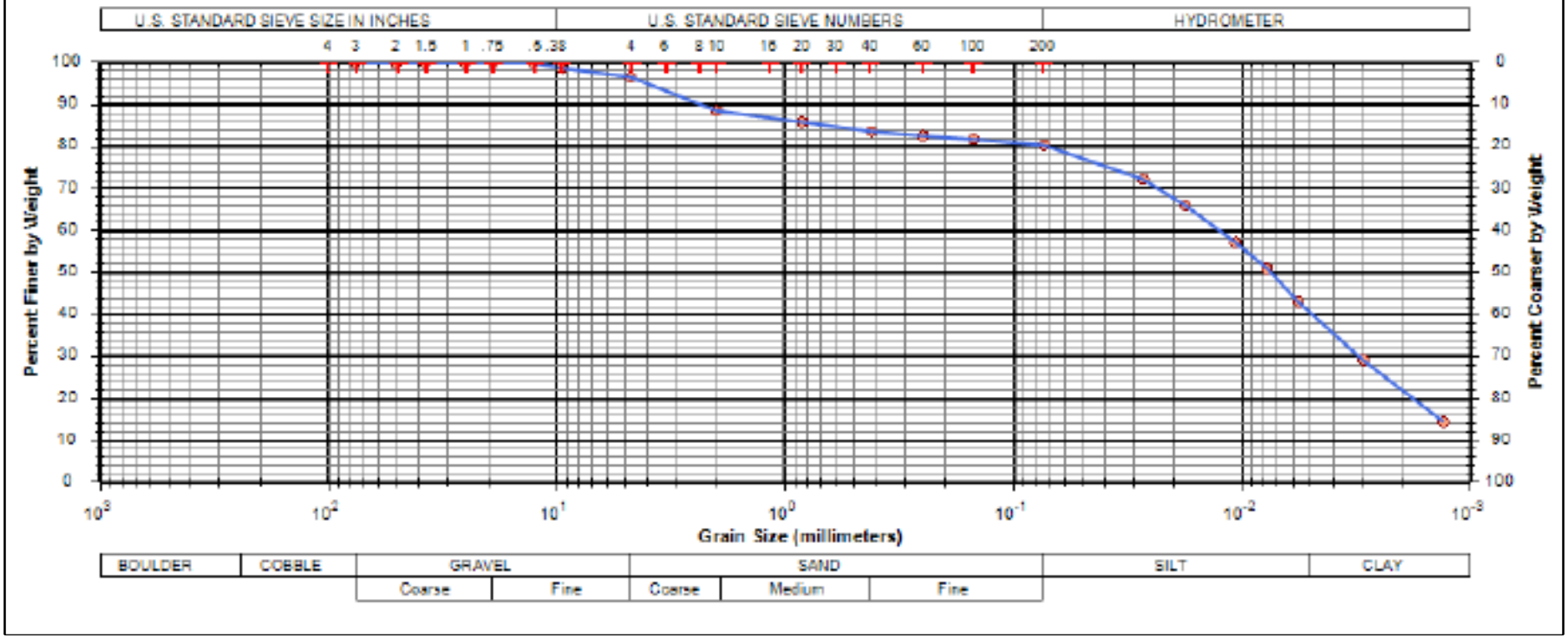
PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	11/05/2021
Boring No.:	B-102	**Sample No.:**	SS-7	**Depth (ft.):**	9	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Reddish brown, trace gray sandy LEAN CLAY, trace gravel (glacial till).					3.4	16.2	40.1	40.3	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						34	20	14		11.2



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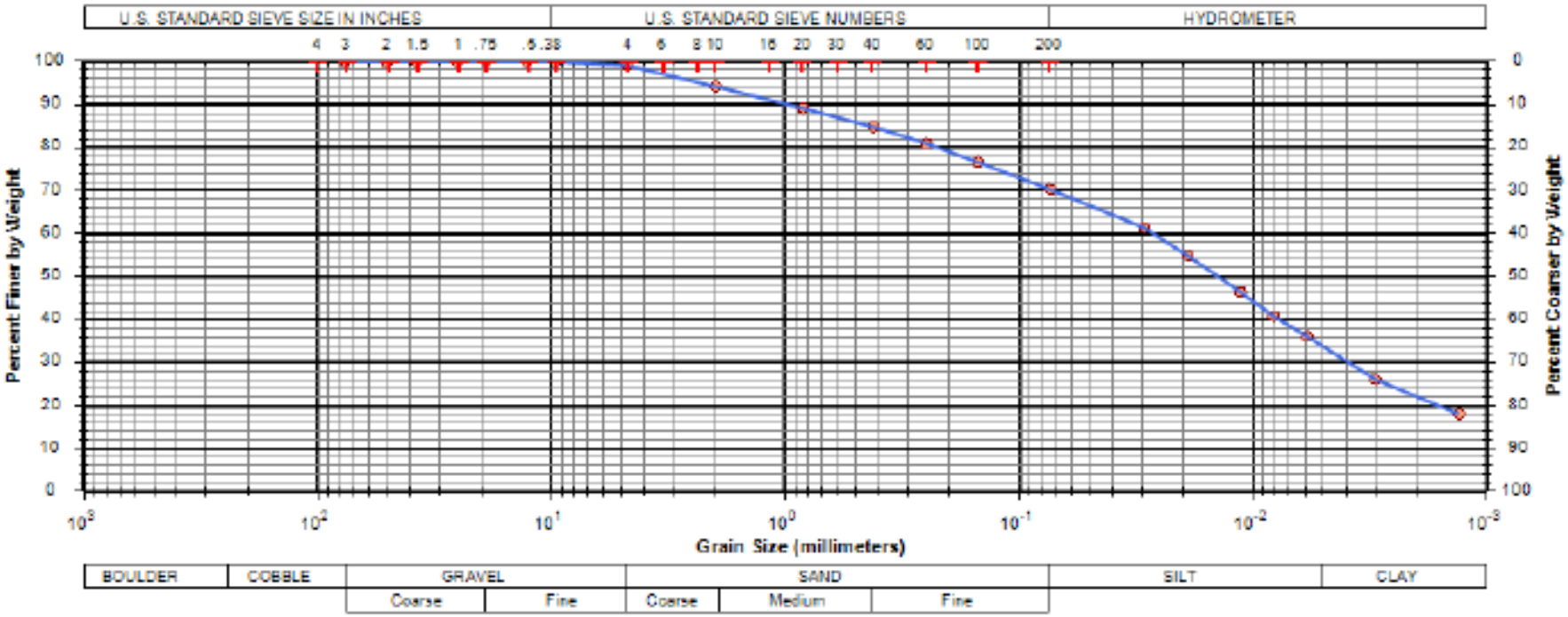
PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	11/05/2021
Boring No.:	B-102	**Sample No.:**	SS-11	**Depth (ft.):**	25	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Gray LEAN CLAY with sand (glacial till).					0.9	28.8	36.6	33.7	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						25	15	10		10.5



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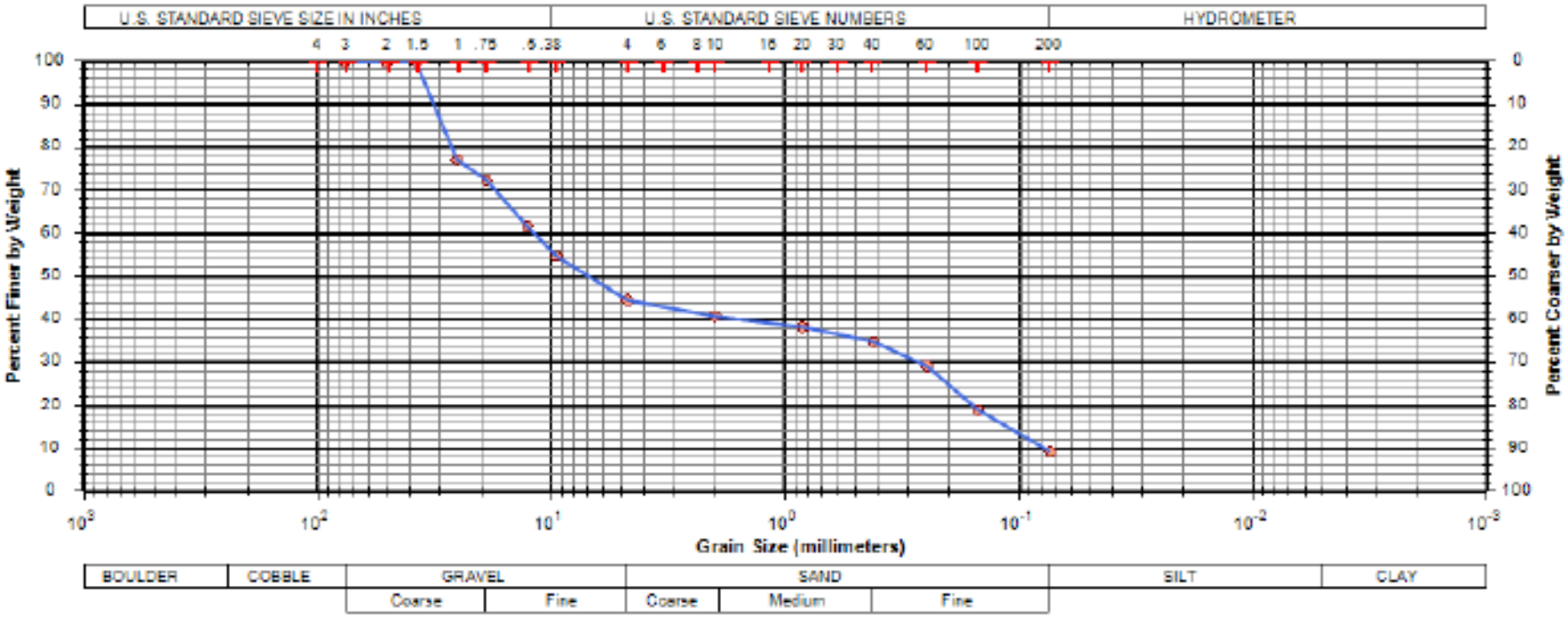
PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	11/05/2021
Boring No.:	B-103	**Sample No.:**	SS-2	**Depth (ft.):**	1.5	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**		**USCS**
Sample Description:	Light and yellow brown poorly graded GRAVEL/ SANDSTONE FRAGMENTS with sand and silty clay (fill).					55.5	35.2	9.3		GP-GM
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
										12.3



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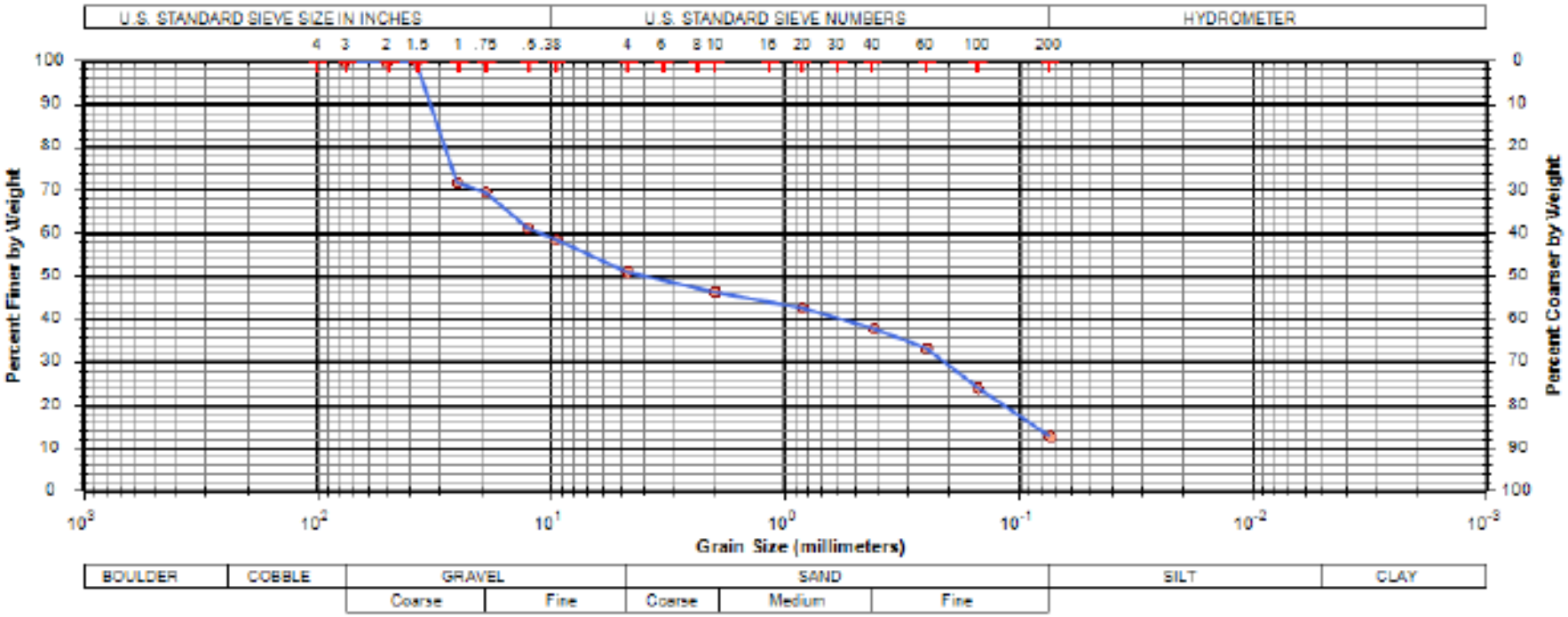
PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	11/05/2021
Boring No.:	B-103	**Sample No.:**	SS-5	**Depth (ft.):**	6	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**		**USCS**
Sample Description:	Light brown silty GRAVEL/ SANDSTONE FRAGMENTS with sand (fill).					48.9	38.3	12.8		GM
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
										5.5



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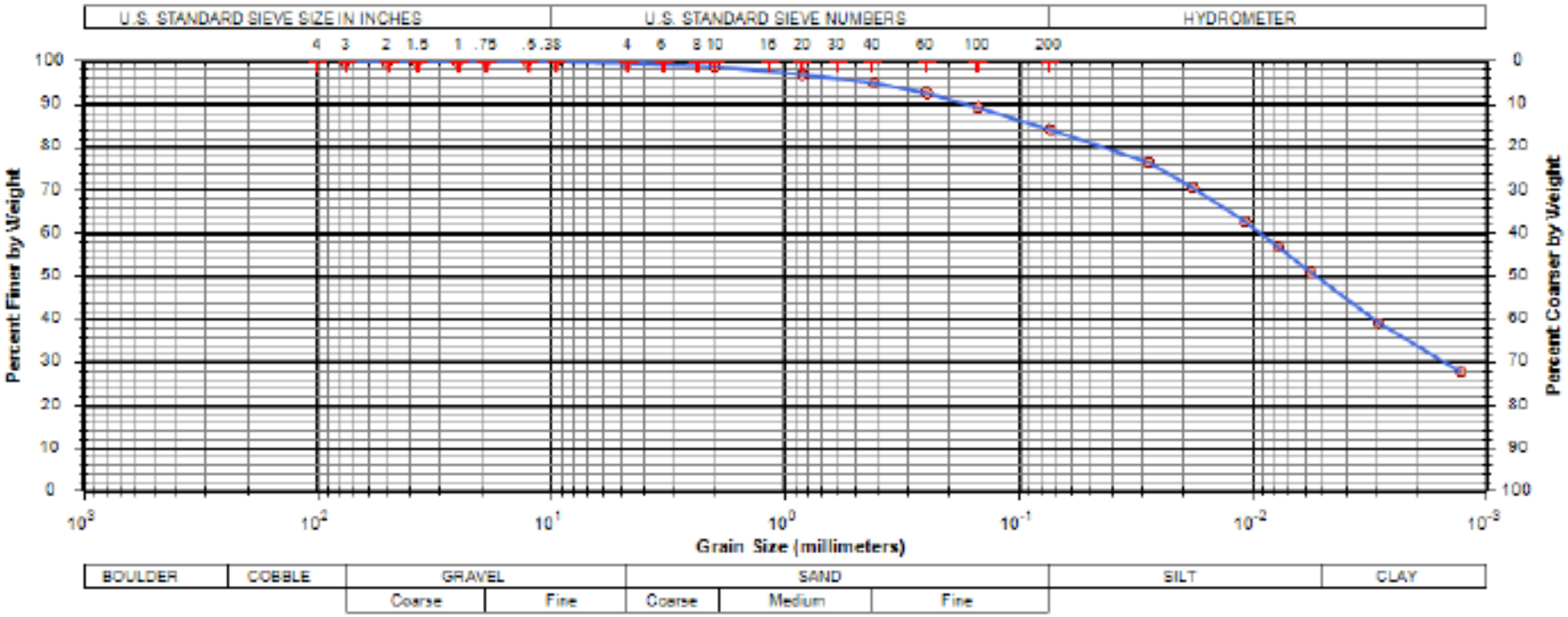
PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	11/05/2021
Boring No.:	B-103	**Sample No.:**	SS-8	**Depth (ft.):**	15	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Gray LEAN CLAY with sand and shale fragments (glacial till).					0.3	15.6	35.3	48.8	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						30	18	12		14.5



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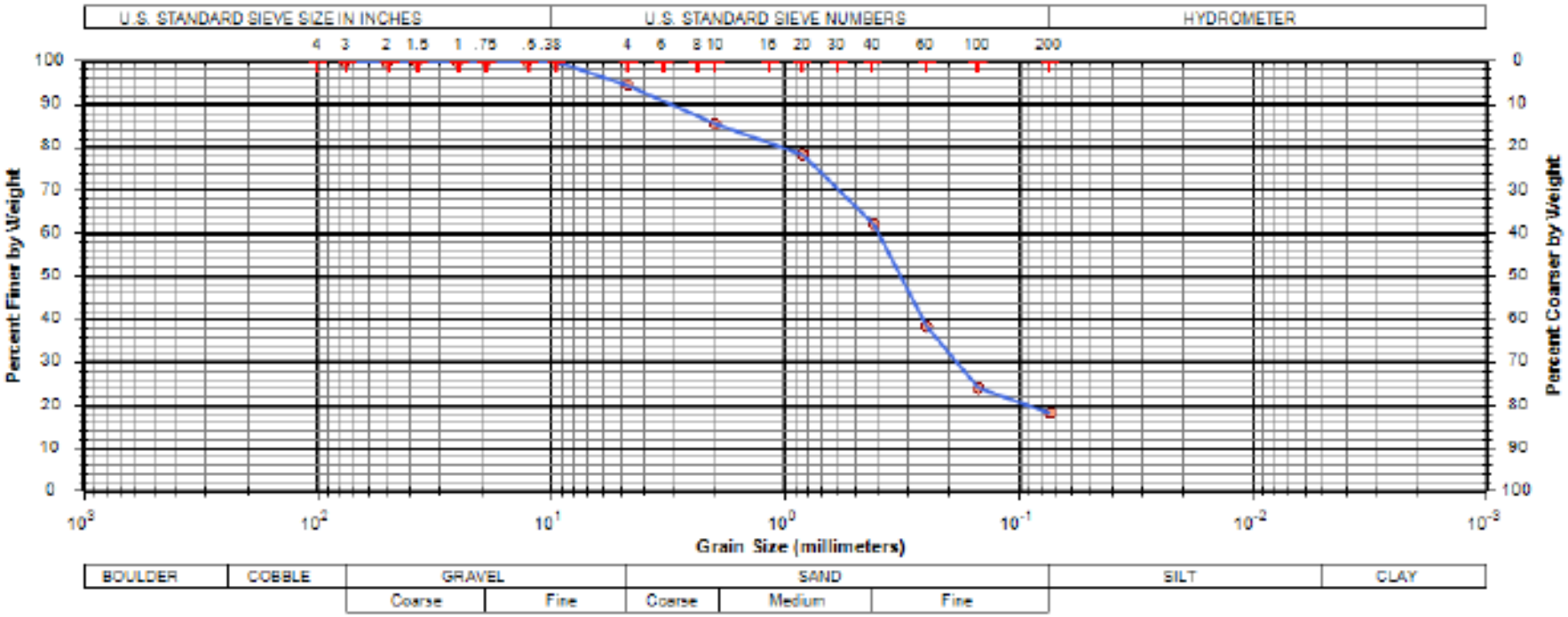
PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company							**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH							**Date:**	11/05/2021
Boring No.:	B-103	**Sample No.:**	SS-9B	**Depth (ft.):**	20.4	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**	**USCS**
Sample Description:	Gray silty SAND, trace fine gravel (glacial till).					5.5	76.3	18.2	SM
						LL	**PL**	**PI** / **Group Index**	**WC (%)**
									16.8



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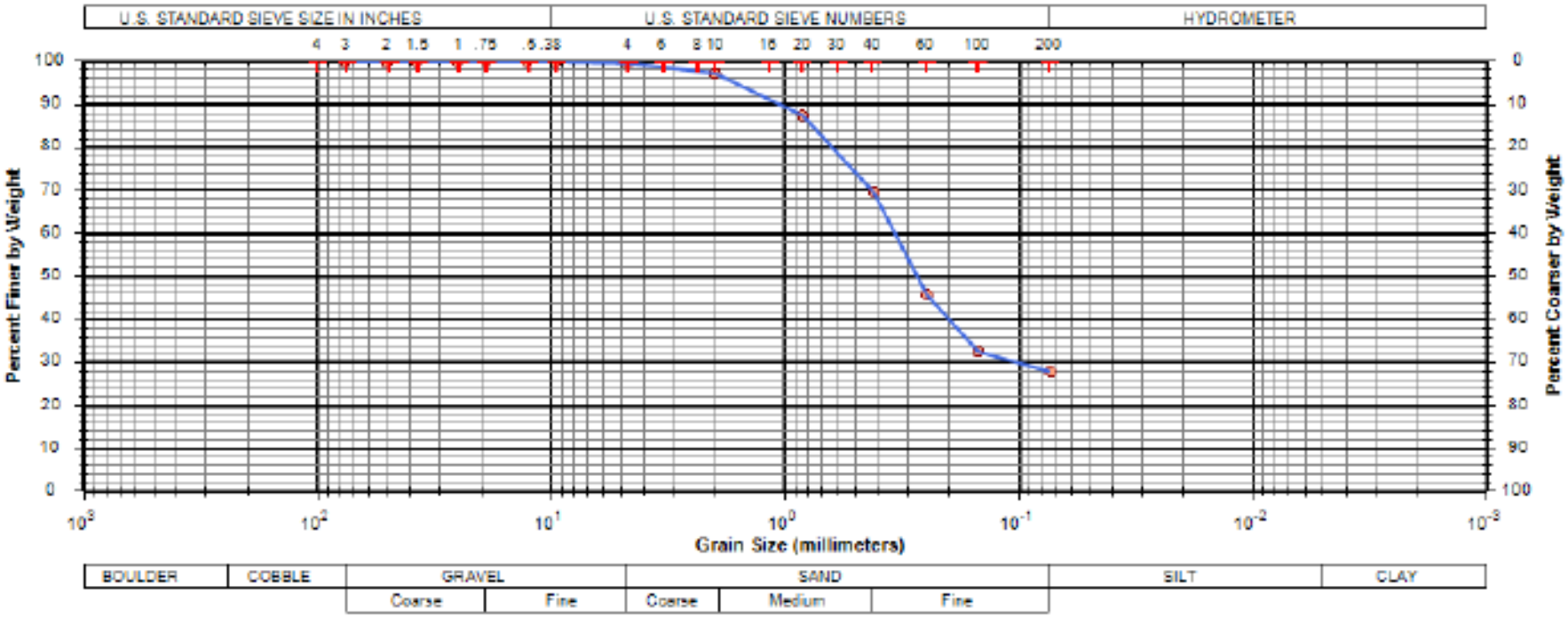
FROM THE GROUND UP

SIEVE ANALYSIS OF AGGREGATES ASTM C-136

Client:	Emerald Energy & Exploration Land Company							**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH							**Date:**	06/24/2021
Boring No.:	B-1	**Sample No.:**	SS-2	**Depth (ft.):**	1.5-3.0	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**	**USCS**
Sample Description:	Brown silty SAND (lacustrine).					0.3	71.8	27.9	-
						LL	**PL**	**PI**	**Group Index**	**WC (%)**



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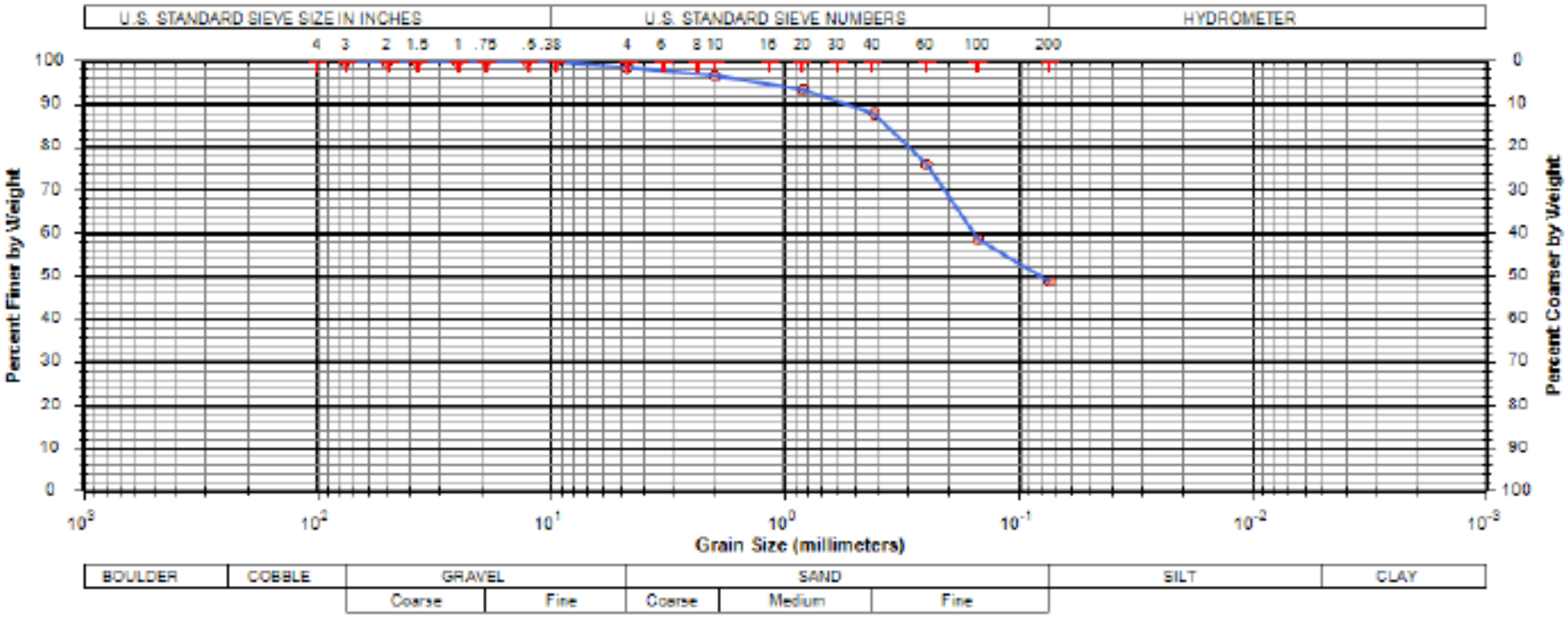
SIEVE ANALYSIS OF AGGREGATES ASTM C-136

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	06/24/2021
Boring No.:	B-1	**Sample No.:**	SS-3	**Depth (ft.):**	3.0-4.5	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**		**USCS**
Sample Description:	Brown and gray silty SAND (lacustrine).					1.4	49.8	48.8		-
						LL	**PL**	**PI**	**Group Index**	**WC (%)**



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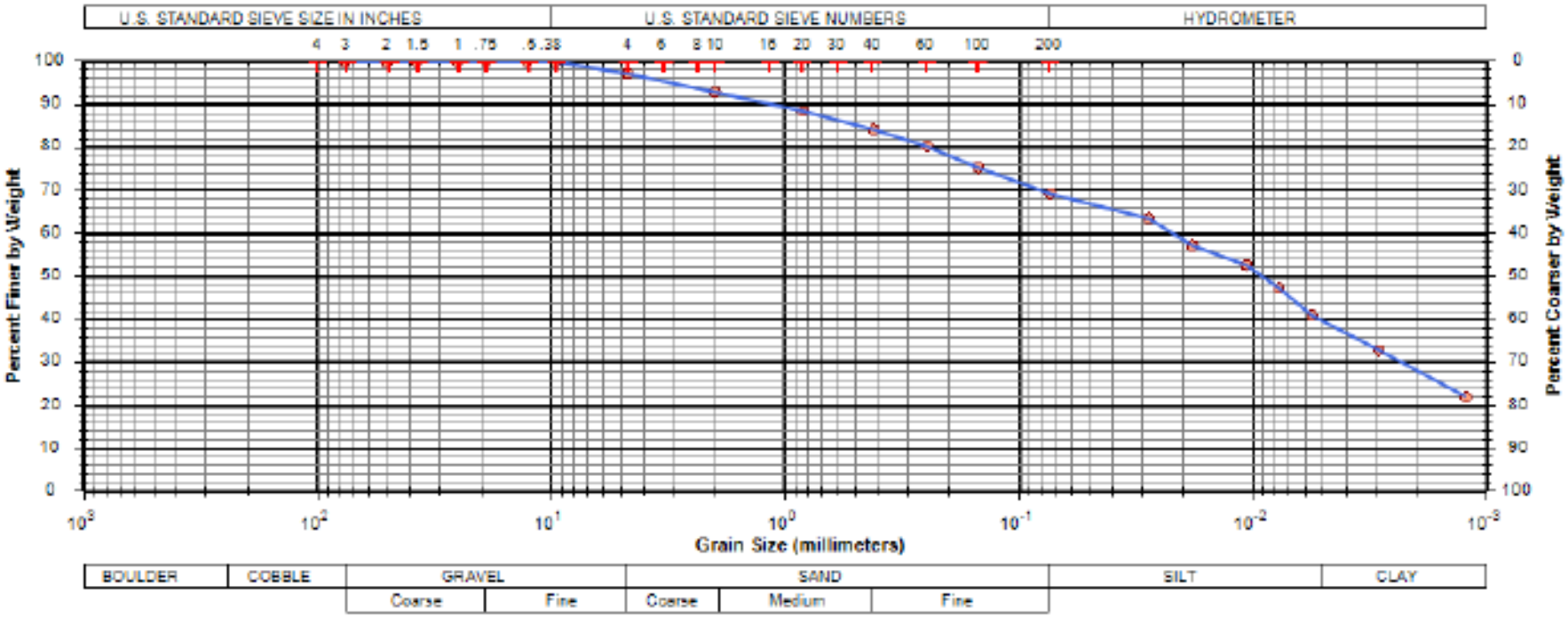
PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	06/24/2021
Boring No.:	B-1	**Sample No.:**	SS-5	**Depth (ft.):**	6.0-7.5	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Gray and brown and reddish brown LEAN CLAY with sand, trace gravel (glacial till).					2.8	27.9	29.7	39.6	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						36	22	14		



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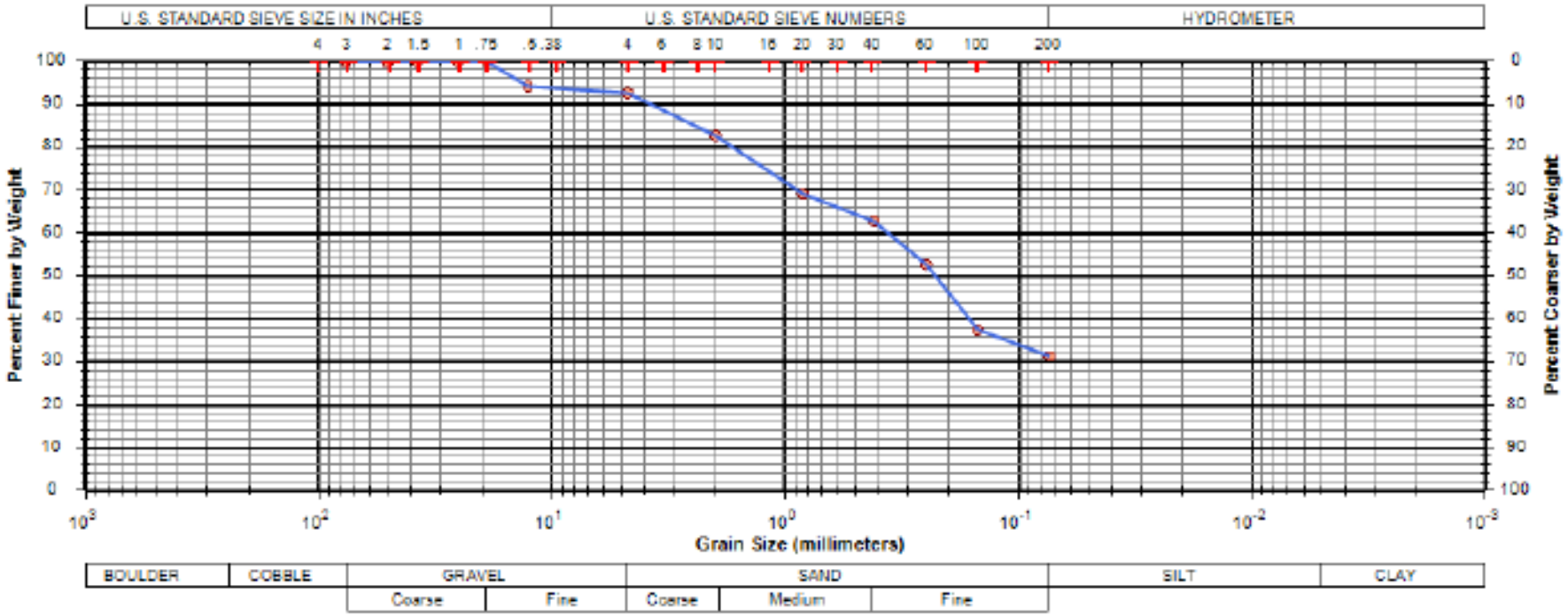
SIEVE ANALYSIS OF AGGREGATES ASTM C-136

Client:	Emerald Energy & Exploration Land Company							**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH							**Date:**	06/24/2021
Boring No.:	B-2	**Sample No.:**	SS-2	**Depth (ft.):**	1.5-3.0	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**	**USCS**
Sample Description:	Brown silty SAND (lacustrine).					7.3	61.3	31.4	-
						LL	**PL**	**PI**	**Group Index**	**WC (%)**



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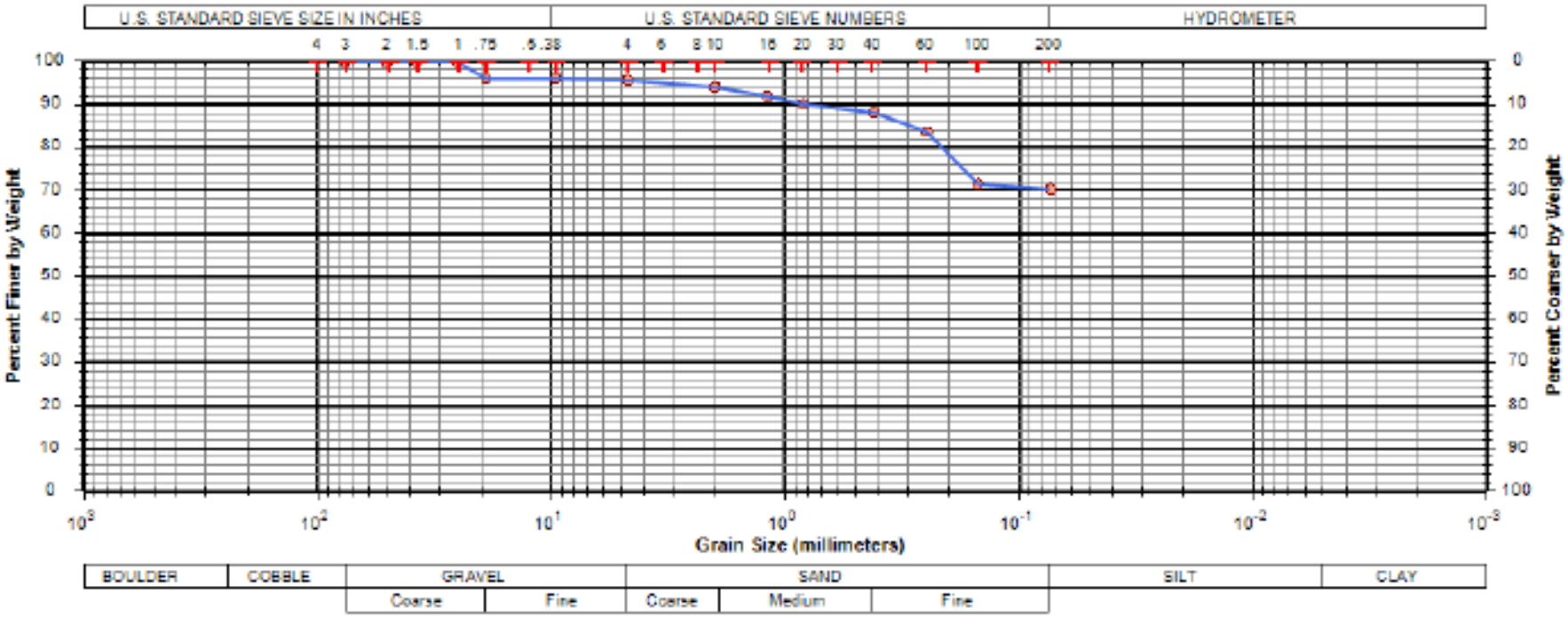
SIEVE ANALYSIS OF AGGREGATES ASTM C-136

Client:	Emerald Energy & Exploration Land Company							**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH							**Date:**	06/24/2021
Boring No.:	B-2	**Sample No.:**	3B	**Depth (ft.):**	4.0-4.5	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**	**USCS**
Sample Description:	Gray LEAN CLAY with sand, trace gravel (glacial till).					4.3	25.4	70.3	
						LL	**PL**	**PI** / **Group Index**	**WC (%)**



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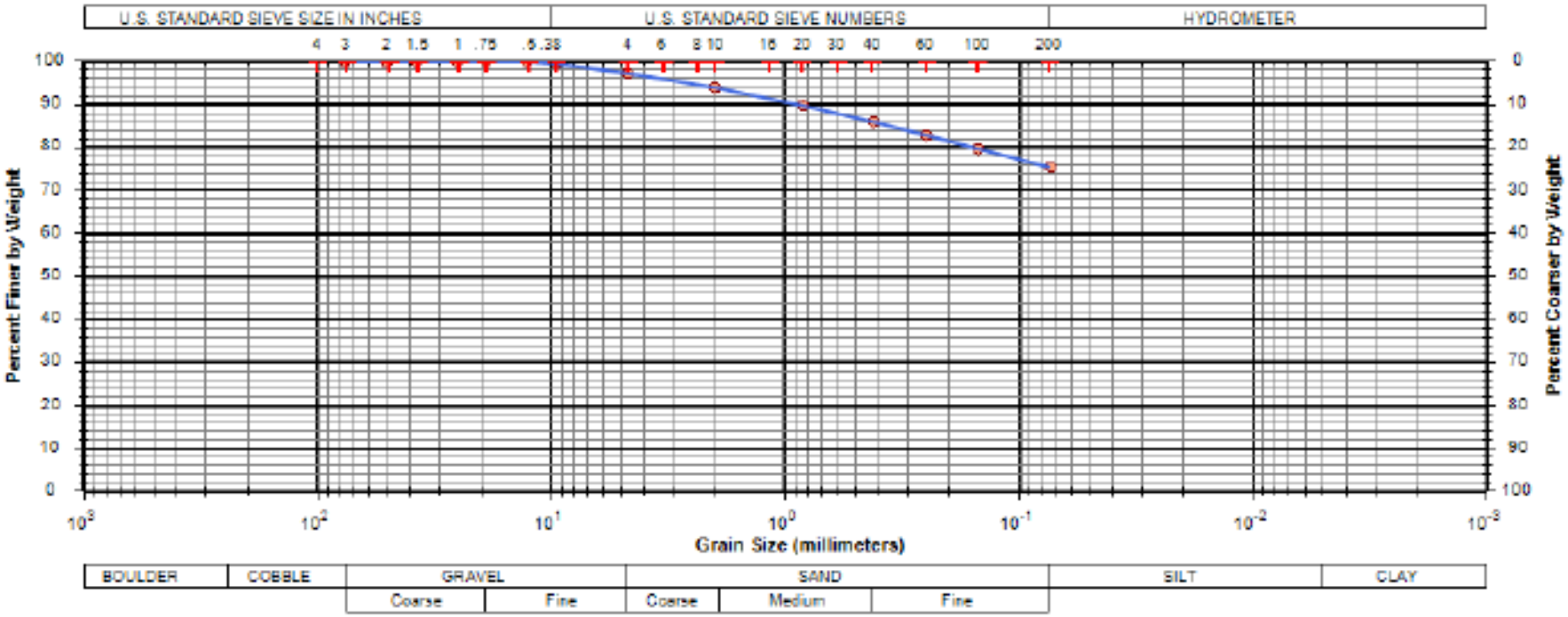
SIEVE ANALYSIS OF AGGREGATES ASTM C-136

Client:	Emerald Energy & Exploration Land Company							**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH							**Date:**	06/24/2021
Boring No.:	B-2	**Sample No.:**	ST-4A	**Depth (ft.):**	4.5-4.7	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**	**USCS**
Sample Description:	Gray LEAN CLAY with sand, trace gravel (glacial till).					2.7	21.9	75.4	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						35	21	14		



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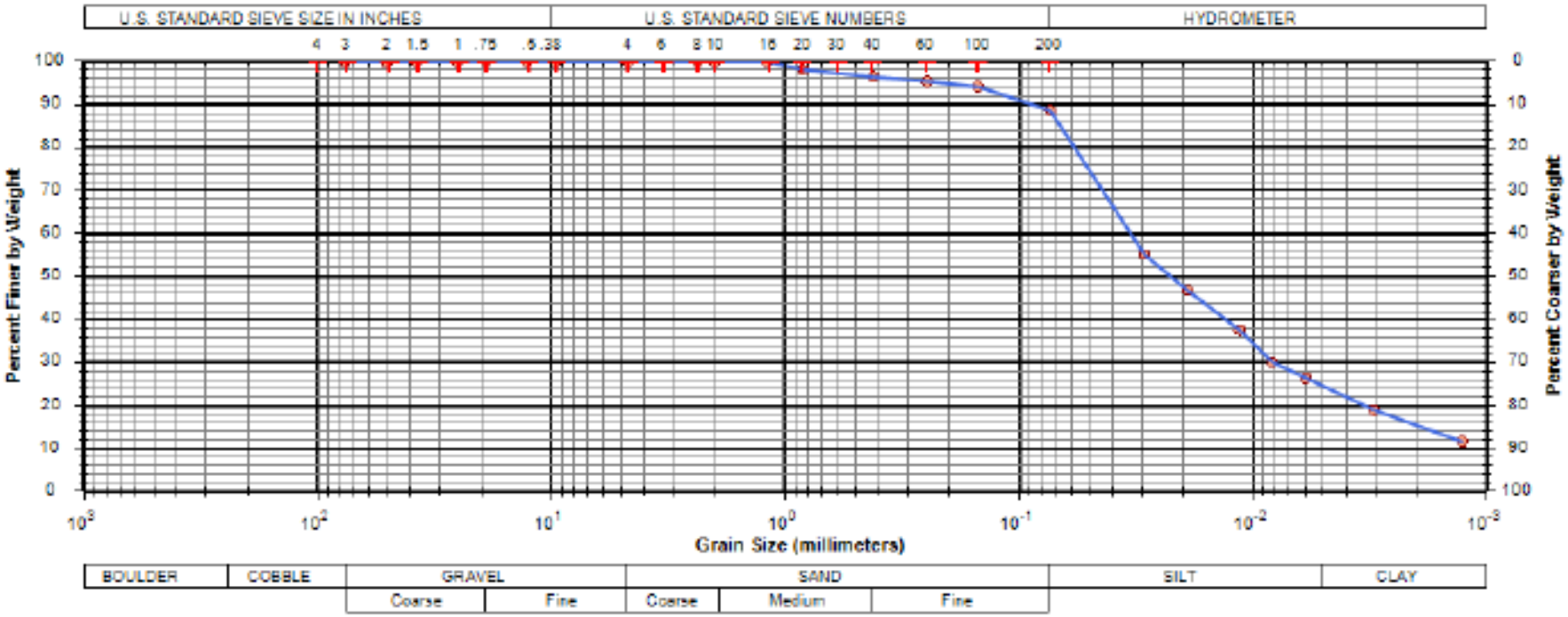
GEOTECHNOLOGY INC
FROM THE GROUND UP

PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	06/24/2021
Boring No.:	B-3	**Sample No.:**	ST-2A	**Depth (ft.):**	1.5-1.8	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Grayish brown LEAN CLAY with sand, trace gravel (glacial till).					0.0	11.4	64.1	24.5	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						30	19	11		



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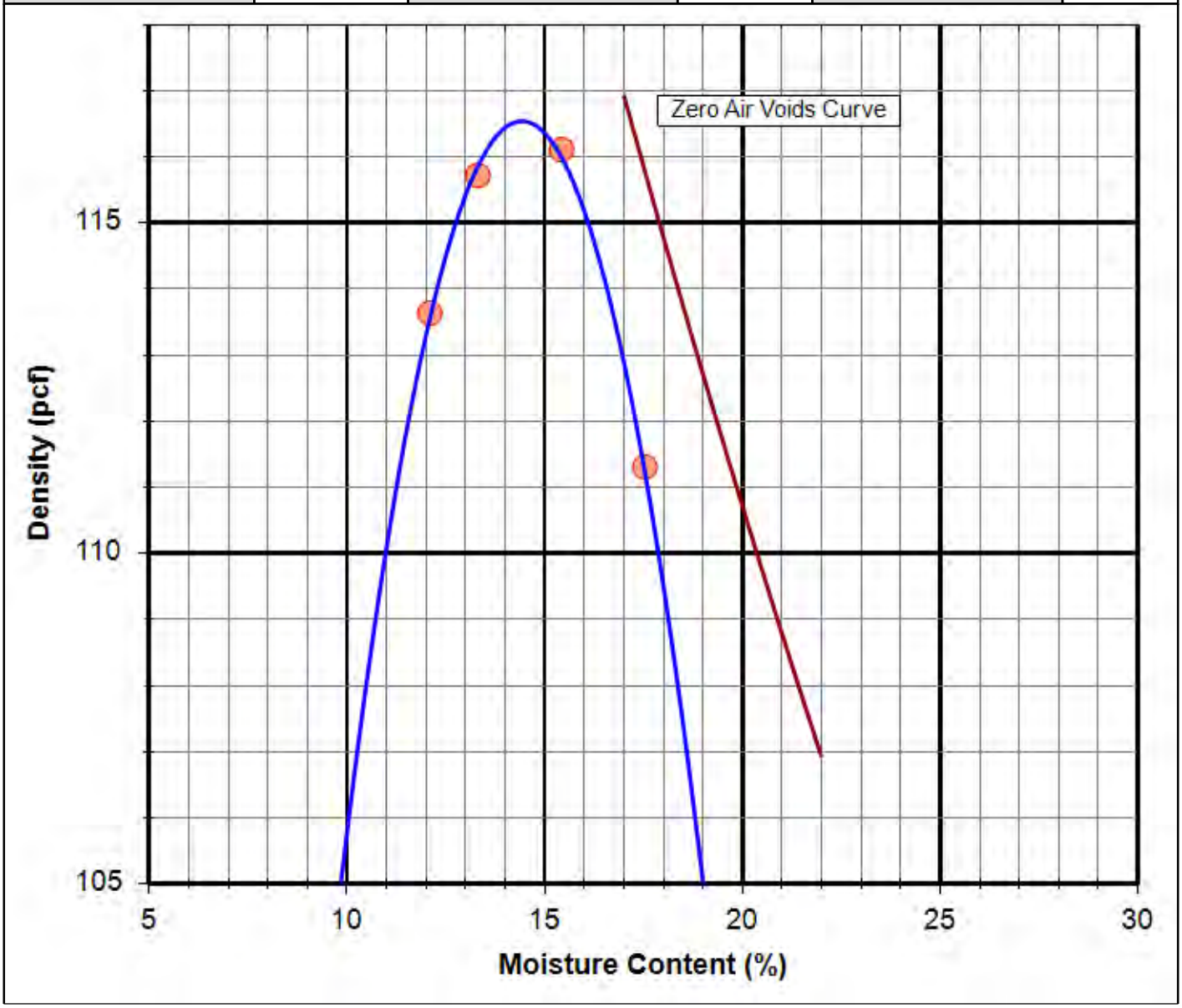
GEOTECHNOLOGY INC
FROM THE GROUND UP

STANDARD PROCTOR MOISTURE DENSITY TEST, ASTM D698, METHOD A

Client:	Emerald Energy & Exploration Land Company	**Project No.:**	J037566.01
Project:	AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH	**Date:**	6/29/2021

Sample Obtained From:	B-3, Bulk			**Depth (ft.):**	0.2 - 5.0
Sample Description:	Gray, grayish brown, and brown LEAN CLAY with sand, trace gravel.	**LL**	**PL**	**PI**	**USCS**
		29	19	10	CL

Maximum Dry Density (pcf):	116.5	**Optimum Moisture Content:**	14.4%	**In Situ Moisture Content:**	20.8%



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GEOTECHNOLOGY
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UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS
ASTM D2166

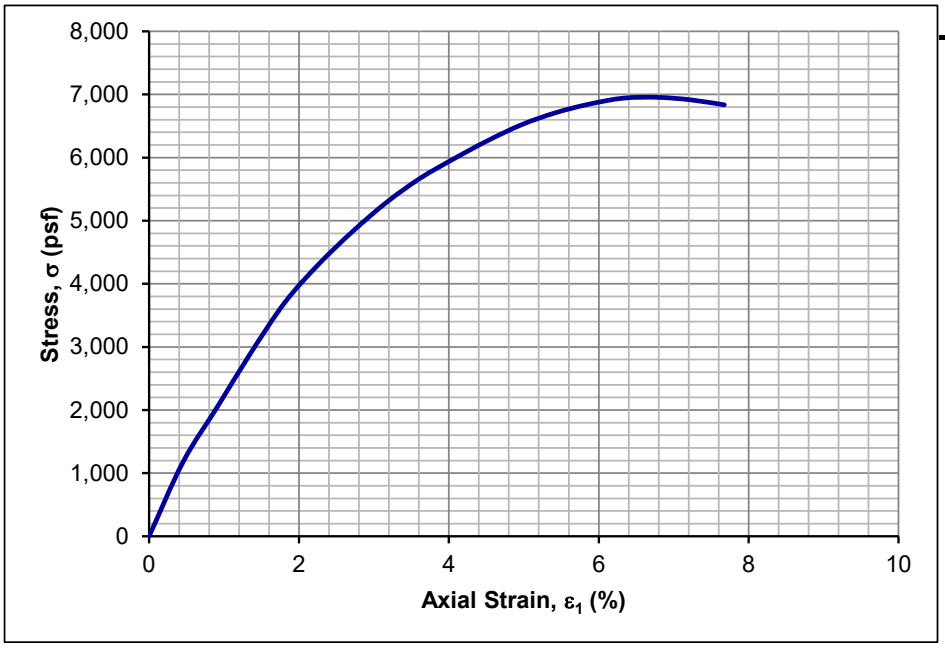
CLIENT : Emerald Energy & Exploration Land Company DATE: 6/17/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-2 SAMPLE NO.: ST-4B DEPTH (ft.): 4.9-5.6
SAMPLE OBTAINED BY: Shelby Tube CONDITION: Undisturbed
SAMPLE DESCRIPTION: Gray moist very stiff LEAN CLAY with sand, trace gravel (glacial till).

LIQUID LIMIT (%): 35 PLASTIC LIMIT (%): 21 PLASTICITY INDEX (%): 14 USCS: CL
GRAVEL (%): 2.7 SAND (%): 21.9 SILT & CLAY (%): 75.4
SPECIFIC GRAVITY OF SOLIDS: 2.75 (Assumed) LOAD CELL NO.: 1059

SAMPLE DATA	
DIAMETER (in.):	2.83
HEIGHT (in.):	5.54
HEIGHT TO DIAMETER RATIO:	1.95
WET UNIT WEIGHT (pcf):	142.6
DRY UNIT WEIGHT (pcf):	125.5
VOID RATIO:	0.37
MOISTURE CONTENT (%)*:	13.7
DEGREE OF SATURATION (%):	100

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.1**
AXIAL STRAIN AT FAILURE (%):	**6.8**
TIME TO FAILURE (min.):	**7.3**
UNCONFINED COMPRESSIVE STRENGTH, q_u (psf):	**6,950**
UNDRAINED SHEAR STRENGTH, s_u (psf):	**3,475**
SENSITIVITY, S_t:	**-**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

*Moisture content determined after shear from entire sample.

GEOTECHNOLOGY
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UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS
ASTM D2166

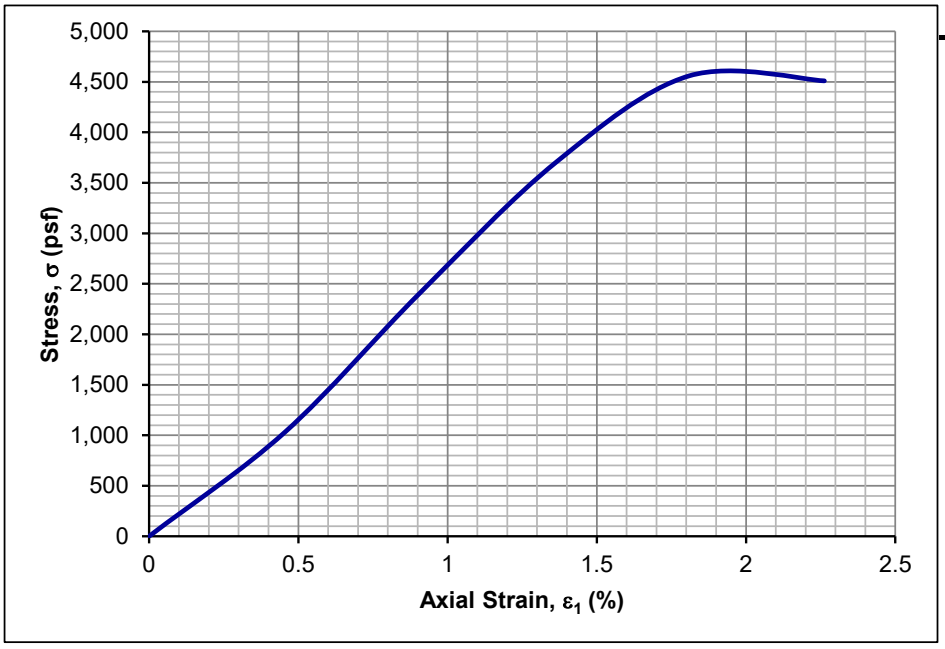
CLIENT : Emerald Energy & Exploration Land Company DATE: 6/17/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-3 SAMPLE NO.: ST-2B DEPTH (ft.): 1.9-2.5
SAMPLE OBTAINED BY: Shelby Tube CONDITION: Undisturbed
SAMPLE DESCRIPTION: Grayish brown moist very stiff LEAN CLAY with sand, trace gravel (glacial till).

LIQUID LIMIT (%): 30 PLASTIC LIMIT (%): 19 PLASTICITY INDEX (%): 11 USCS: CL
GRAVEL (%): 0.0 SAND (%): 11.4 SILT (%): 64.1 CLAY (%): 24.5
SPECIFIC GRAVITY OF SOLIDS: 2.75 (Assumed) LOAD CELL NO.: 1059

SAMPLE DATA	
DIAMETER (in.):	2.80
HEIGHT (in.):	5.53
HEIGHT TO DIAMETER RATIO:	1.98
WET UNIT WEIGHT (pcf):	135.0
DRY UNIT WEIGHT (pcf):	120.3
VOID RATIO:	0.43
MOISTURE CONTENT (%)*:	12.3
DEGREE OF SATURATION (%):	79

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.1**
AXIAL STRAIN AT FAILURE (%):	**1.8**
TIME TO FAILURE (min.):	**1.9**
UNCONFINED COMPRESSIVE STRENGTH, q_u (psf):	**4,560**
UNDRAINED SHEAR STRENGTH, s_u (psf):	**2,280**
SENSITIVITY, S_t:	**-**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

*Moisture content determined after shear from entire sample.

GEOTECHNOLOGY
A Universal Engineering Sciences Company

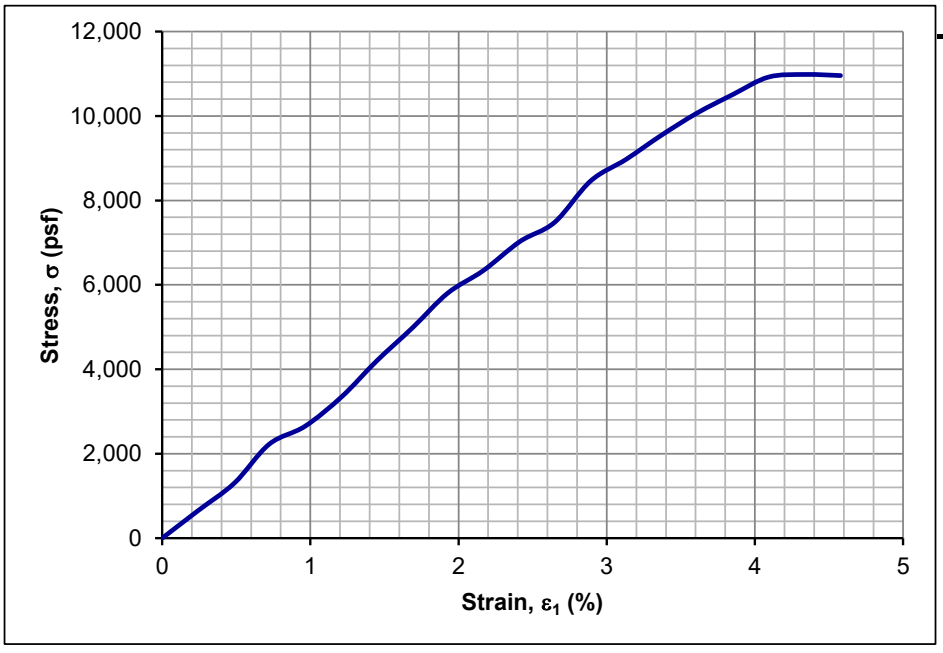
UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

CLIENT : Emerald Energy & Exploration Land Company DATE: 11/2/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-101 SAMPLE NO.: RC-10 DEPTH (ft.): 20.9-21.4
SAMPLE DESCRIPTION: Reddish brown damp extremely weak fissile SHALE.
BEDROCK FORMATION: Berea Sandstone and Bedford Shale, Undivided
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: 10-k Load Frame with Load Cell No. 1008

SAMPLE DATA	
DIAMETER (in.):	1.89
HEIGHT (in.):	4.16
HEIGHT TO DIAMETER RATIO:	2.2
WET UNIT WEIGHT (pcf):	148.7
DRY UNIT WEIGHT (pcf):	139.4
MOISTURE CONTENT (%):	6.7

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.4**
TIME TO FAILURE (min.):	**3.1**
AXIAL STRAIN AT FAILURE (%):	**4.3**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**11.0**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**76.3**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

GEOTECHNOLOGY
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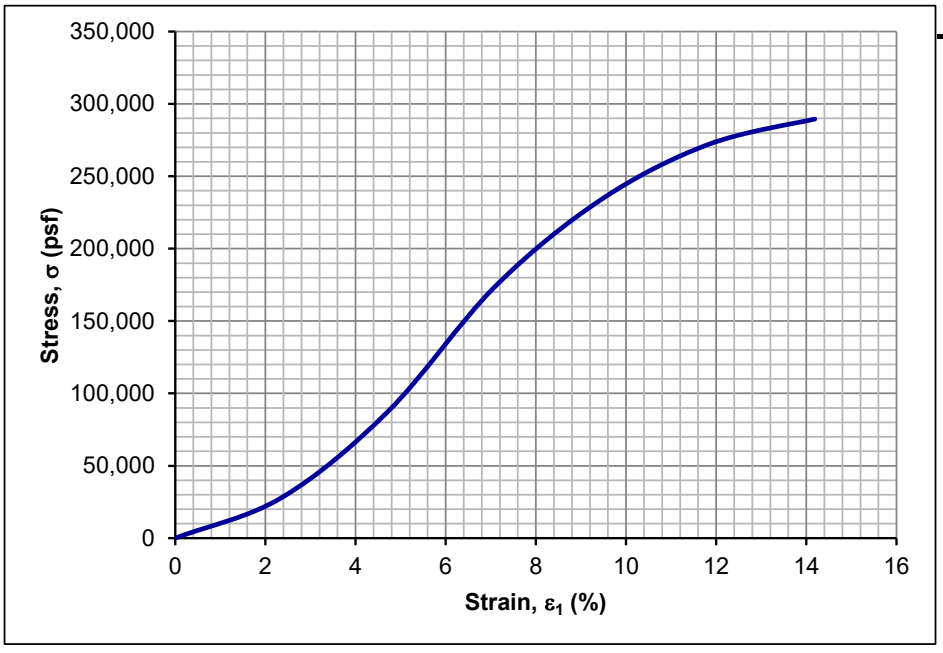
UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

CLIENT : Emerald Energy & Exploration Land Company DATE: 11/16/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

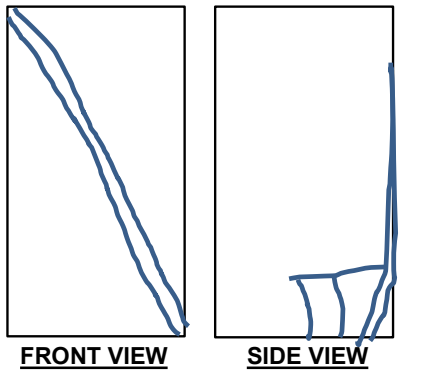
BORING NO.: B-103 SAMPLE NO.: RC-12 DEPTH (ft.): 33.0-34.0
SAMPLE DESCRIPTION: Dark gray damp weak SILTSTONE
BEDROCK FORMATION: Berea Sandstone and Bedford Shale, Undivided
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: 10-k Load Frame with Load Cell No. 1008

SAMPLE DATA	
DIAMETER (in.):	1.86
HEIGHT (in.):	4.23
HEIGHT TO DIAMETER RATIO:	2.3
WET UNIT WEIGHT (pcf):	150.6
DRY UNIT WEIGHT (pcf):	144.4
MOISTURE CONTENT (%):	4.3

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**9.5**
TIME TO FAILURE (min.):	**1.5**
AXIAL STRAIN AT FAILURE (%):	**14.2**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**290.0**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**2,010.0**



FAILURE SHAPES



REMARKS :

GEOTECHNOLOGY
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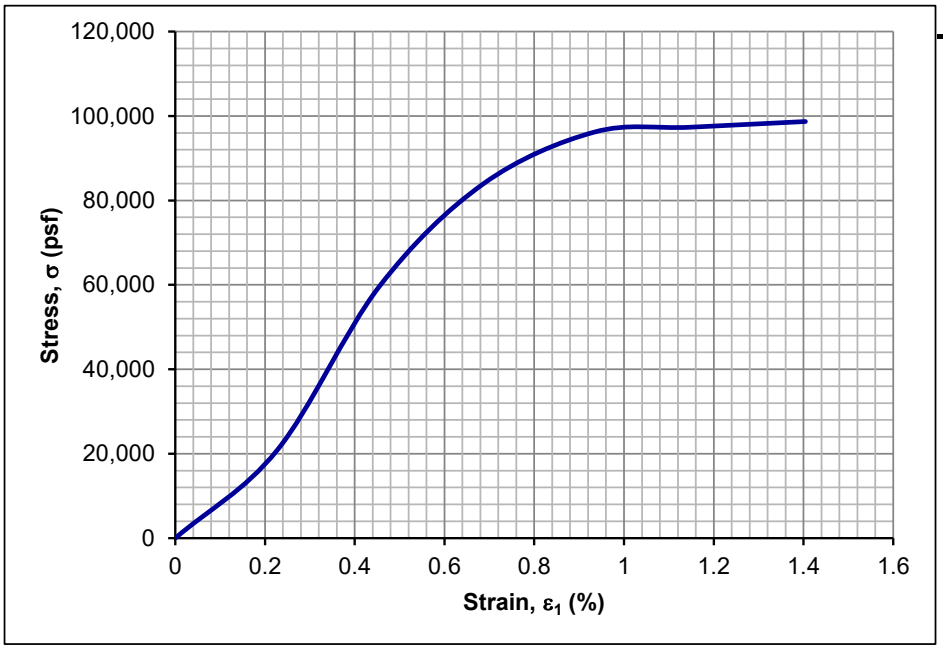
UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

CLIENT : Emerald Energy & Exploration Land Company DATE: 11/2/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-103 SAMPLE NO.: RC-13 DEPTH (ft.): 39.7-40.4
SAMPLE DESCRIPTION: Interbedded gray damp very weak unweathered SHALE and SILTSTONE.
BEDROCK FORMATION: Berea Sandstone and Bedford Shale, Undivided
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: 10-k Load Frame with Load Cell No. 1008

SAMPLE DATA	
DIAMETER (in.):	1.83
HEIGHT (in.):	4.36
HEIGHT TO DIAMETER RATIO:	2.4
WET UNIT WEIGHT (pcf):	152.0
DRY UNIT WEIGHT (pcf):	143.8
MOISTURE CONTENT (%):	5.7

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.4**
TIME TO FAILURE (min.):	**1.0**
AXIAL STRAIN AT FAILURE (%):	**1.4**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**98.7**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**685.0**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

GEOTECHNOLOGY
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UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

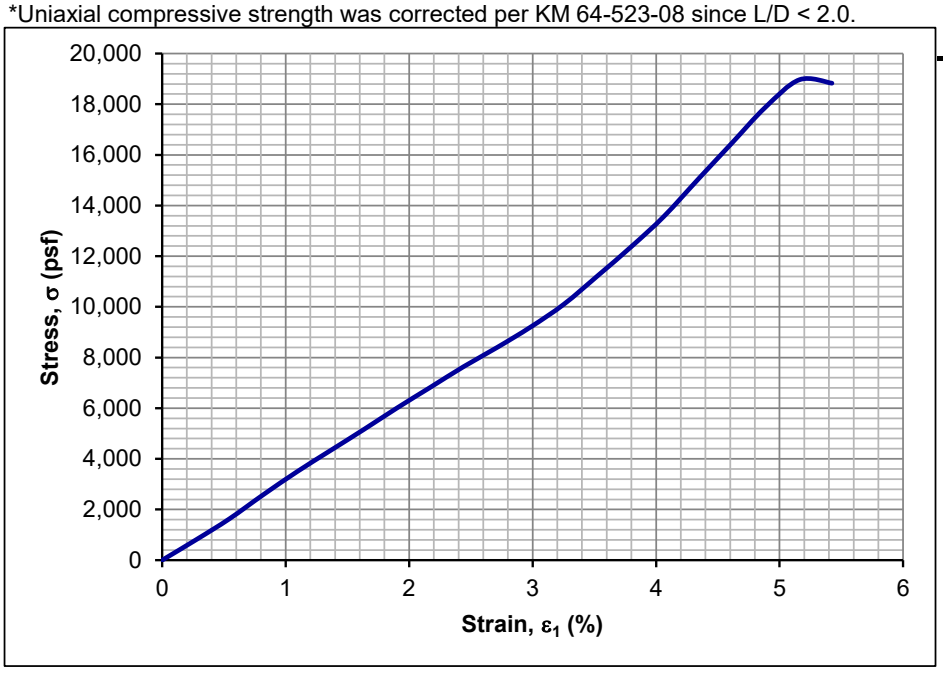
CLIENT : Emerald Energy & Exploration Land Company DATE: 6/17/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-1 SAMPLE NO.: RC-10 DEPTH (ft.): 26.2-27.8
SAMPLE DESCRIPTION: Interbedded gray extremely weak SILTSTONE and SHALE thinly laminated, medium bedded, fissile.
BEDROCK FORMATION: Berea Sandstone and Bedford Shale, Undivided
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: Forney QC-200-08

SAMPLE DATA	
DIAMETER (in.):	1.89
HEIGHT (in.):	3.69
HEIGHT TO DIAMETER RATIO*:	1.9
WET UNIT WEIGHT (pcf):	151.6
DRY UNIT WEIGHT (pcf):	143.9
MOISTURE CONTENT (%):	5.3

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.6**
TIME TO FAILURE (min.):	**3.3**
AXIAL STRAIN AT FAILURE (%):	**5.2**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**18.9**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**131.0**

*Uniaxial compressive strength was corrected per KM 64-523-08 since L/D < 2.0.



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

GEOTECHNOLOGY
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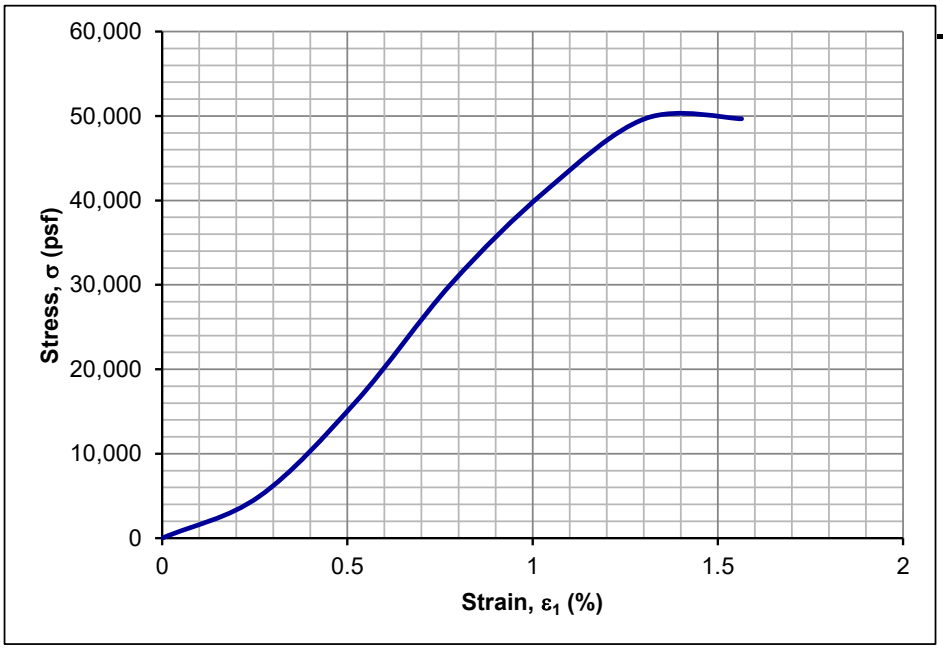
UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

CLIENT : Emerald Energy & Exploration Land Company DATE: 6/17/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-2 SAMPLE NO.: RC-8 DEPTH (ft.): 18.4-19.0
SAMPLE DESCRIPTION: Gray slightly moist very weak SILTSTONE.
BEDROCK FORMATION: Berea Sandstone and Bedford Shale, Undivided
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: Forney QC-200-08

SAMPLE DATA	
DIAMETER (in.):	1.86
HEIGHT (in.):	3.86
HEIGHT TO DIAMETER RATIO:	2.1
WET UNIT WEIGHT (pcf):	159.6
DRY UNIT WEIGHT (pcf):	153.3
MOISTURE CONTENT (%):	4.1

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.4**
TIME TO FAILURE (min.):	**0.9**
AXIAL STRAIN AT FAILURE (%):	**1.3**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**49.7**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**345.0**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

GEOTECHNOLOGY
A Universal Engineering Sciences Company

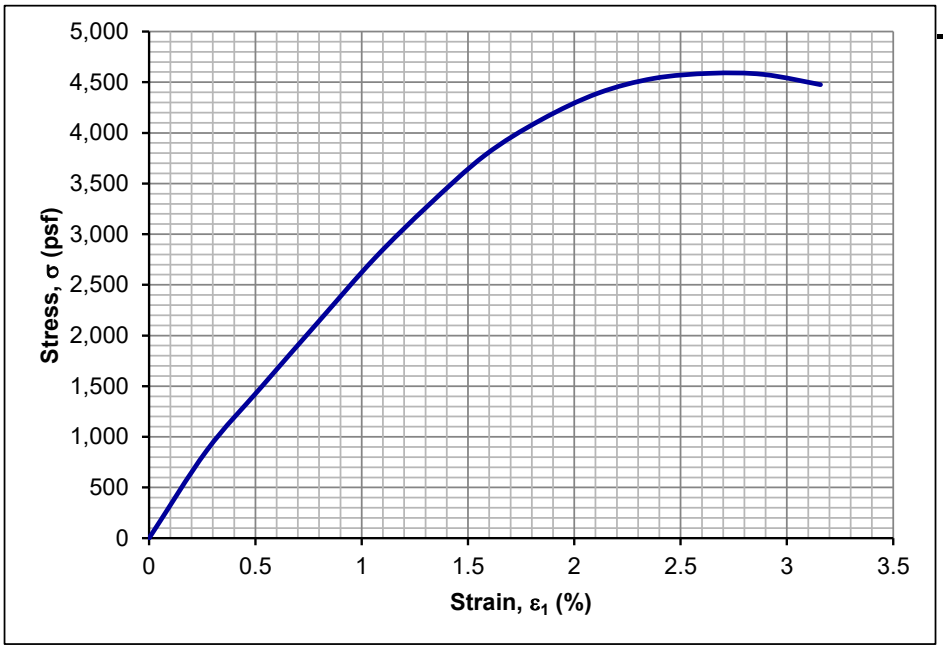
UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

CLIENT : Emerald Energy & Exploration Land Company DATE: 6/17/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-3 SAMPLE NO.: RC-7 DEPTH (ft.): 12.0-12.5
SAMPLE DESCRIPTION: Reddish brown moist extremely weak weathered SHALE.
BEDROCK FORMATION: Berea Sandstone and Bedford Shale, Undivided
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: Forney QC-200-08

SAMPLE DATA	
DIAMETER (in.):	1.81
HEIGHT (in.):	3.80
HEIGHT TO DIAMETER RATIO:	2.1
WET UNIT WEIGHT (pcf):	147.0
DRY UNIT WEIGHT (pcf):	134.8
MOISTURE CONTENT (%):	9.0

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.6**
TIME TO FAILURE (min.):	**1.7**
AXIAL STRAIN AT FAILURE (%):	**2.6**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**4.6**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**31.9**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

GEOTECHNOLOGY
A Universal Engineering Sciences Company

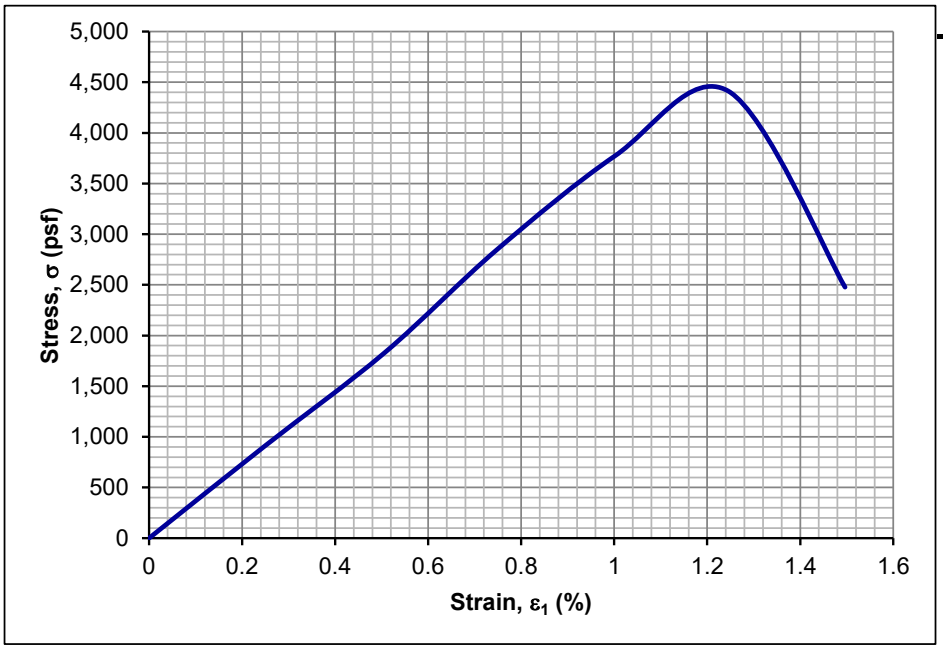
UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

CLIENT : Emerald Energy & Exploration Land Company DATE: 6/17/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-3 SAMPLE NO.: RC-8 DEPTH (ft.): 16.6-17.4
SAMPLE DESCRIPTION: Reddish brown moist extremely weak weathered SHALE.
BEDROCK FORMATION: Berea Sandstone and Bedford Shale, Undivided
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: Forney QC-200-08

SAMPLE DATA	
DIAMETER (in.):	1.85
HEIGHT (in.):	4.02
HEIGHT TO DIAMETER RATIO:	2.2
WET UNIT WEIGHT (pcf):	151.9
DRY UNIT WEIGHT (pcf):	142.4
MOISTURE CONTENT (%):	6.7

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.4**
TIME TO FAILURE (min.):	**0.9**
AXIAL STRAIN AT FAILURE (%):	**1.2**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**4.4**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**30.6**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

APPENDIX E – IDEALIZED SOIL & BEDROCK PROFILES

GEOTECHNOLOGY
A Universal Engineering Sciences Company

CLIENT: Emerald Energy & Exploration Land Company
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 138 kV Transmission Line
PROJECT LOCATION: Amherst, Ohio

IDEALIZED SOIL & BEDROCK PROFILE
PARAMETERS FOR AXIAL/LATERAL LOAD ANALYSES
FOR STRUCTURE 1006B (BORING B-103)

El. (ft.)	Depth (ft.)	
698.0	0.0	Ground Surface
		Loose to Medium Dense Fill (Reese sand model): *Lateral Parameters for LPILE/MFAD* γ = 120 pcf γ' = 62.6 pcf ϕ = 32° k = 40 pci for submerged conditions and 55 pci above groundwater table E_p = 600 psi *Axial Parameters*
690.5	7.5	$q_{s,all}$ = N/A $q_{p,all}$ = N/A
		Loose Lacustrine Soils (Reese sand model): *Lateral Parameters for LPILE/MFAD* γ = 105 pcf γ' = 47.6 pcf ϕ = 30° k = 20 pci for submerged conditions and 25 pci above groundwater table E_p = 380 psi *Axial Parameters*
685.5	12.5	$q_{s,all}$ = 265 psf $q_{p,all}$ = N/A
		Very Stiff Glacial Till (stiff clay model): *Lateral Parameters for LPILE/MFAD* γ = 130 pcf γ' = 72.6 pcf c = 3,000 psf ε_{50} = 0.005 E_p = 1,800 psi *Axial Parameters*
667.5	30.5	$q_{s,all}$ = 600 psf $q_{p,all}$ = 9,000 psf
		Shale and Siltstone Bedrock: *Lateral Parameters for LPILE (use stiff clay model):* $\gamma = \gamma'$ = 145 pcf q_u = 680 psi k_{rm} = 0.0005 RQD = 55% *Lateral Parameters for MFAD* $\gamma = \gamma'$ = 145 pcf q_u = 680 psi RQD = 55% RMR = 34 E_{RM} = 580 psi c_{RM} = 19 psi ϕ_{RM} = 34° τ_{ult} = 40 psi *Axial Parameters* $q_{s,all}$ = 1,850 psf $q_{p,all}$ = 65,000 psf (min. bedrock embedment = 1 shaft diameter)

Symbol Definition (see notes on next page):

γ = Unit weight
γ' = Effective unit weight
c = Cohesion
ε_{50} = Strain at 50% of unconfined compressive strength
E_p = Deformation modulus
$q_{s,all}$ = Allowable side resistance
$q_{p,all}$ = Allowable end/tip resistance
q_u = Uniaxial compressive strength
RQD = Rock quality designation
k_{rm} = Bedrock strain factor
RMR = Rock mass rating
E_{RM} = Rock mass modulus
c_{RM} = Rock mass cohesion
ϕ_{RM} = Rock mass friction angle
τ_{ult} = Nominal rock-concrete bond strength

GEOTECHNOLOGY
A Universal Engineering Sciences Company

CLIENT:	Emerald Energy & Exploration Land Company
PROJECT NO.:	J037566.01
PROJECT:	AMPT - Amherst #2 138 kV Transmission Line
PROJECT LOCATION:	Amherst, Ohio

Notes for Structure 1006B (Boring B-103):

- Axial side resistance should be ignored in the upper 5 feet of the profile.
- Laterally loaded deep foundations should be designed using the p-y approach using the above-provided parameters.
- Assume static groundwater table is at a depth of 20 feet from the ground surface.
- Assume static groundwater table is at the bedrock surface.
- Submerged (effective) unit weights should be used below the groundwater table to account for effective stresses in the analyses.

GEOTECHNOLOGY
A Universal Engineering Sciences Company

CLIENT: Emerald Energy & Exploration Land Company
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 138 kV Transmission Line
PROJECT LOCATION: Amherst, Ohio

IDEALIZED SOIL & BEDROCK PROFILE
PARAMETERS FOR AXIAL/LATERAL LOAD ANALYSES
FOR STRUCTURE 1006C (BORING B-102)

El. (ft.)	Depth (ft.)	
697.0	0.0	Ground Surface
691.0	6.0	Loose Fill (Reese sand model): *Lateral Parameters for LPILE/MFAD* γ = 105 pcf $\quad$ γ' = 47.6 pcf ϕ = 30° k = 20 pci for submerged conditions and 25 pci above groundwater table E_p = 380 psi *Axial Parameters* $q_{s,all}$ = N/A $\quad$ $q_{p,all}$ = N/A
688.5	8.5	Very Loose Lacustrine Soils (Reese sand model): *Lateral Parameters for LPILE/MFAD* γ = 100 pcf $\quad$ γ' = 42.6 pcf ϕ = 28° k = 10 pci for submerged conditions and above groundwater table E_p = 330 psi *Axial Parameters* $q_{s,all}$ = 155 psf $\quad$ $q_{p,all}$ = N/A
661.0	36.0	Very Stiff Glacial Till (stiff clay model): *Lateral Parameters for LPILE/MFAD* γ = 130 pcf $\quad$ γ' = 72.6 pcf c = 3,000 psf $\quad$ ε_{50} = 0.005 E_p = 1.8 ksi *Axial Parameters* $q_{s,all}$ = 600 psf $\quad$ $q_{p,all}$ = 9,000 psf
		Weathered Shale Bedrock with Siltstone: *Lateral Parameters for LPILE (use stiff clay model):* $\gamma = \gamma'$ = 140 pcf c = 4,300 psf $\quad$ ε_{50} = 0.003 *Lateral Parameters for MFAD* $\gamma = \gamma'$ = 140 pcf $\quad$ q_u = 60 psi RQD = 0% RMR = 23 $\quad$ E_{RM} = 310 psi c_{RM} = 16 psi $\quad$ ϕ_{RM} = 31° τ_{ult} = 10 psi *Axial Parameters* $q_{s,all}$ = 470 psf $\quad$ $q_{p,all}$ = 10,000 psf (12-inch min. bedrock embedment)

Symbol Definition (see notes on next page):

γ = Unit weight
γ' = Effective unit weight
c = Cohesion
ε_{50} = Strain at 50% of unconfined compressive strength
E_p = Deformation modulus
$q_{s,all}$ = Allowable side resistance
$q_{p,all}$ = Allowable end/tip resistance
q_u = Uniaxial compressive strength
RQD = Rock quality designation
RMR = Rock mass rating
E_{RM} = Rock mass modulus
c_{RM} = Rock mass cohesion
ϕ_{RM} = Rock mass friction angle
τ_{ult} = Nominal rock-concrete bond strength

GEOTECHNOLOGY
A Universal Engineering Sciences Company

CLIENT:	Emerald Energy & Exploration Land Company
PROJECT NO.:	J037566.01
PROJECT:	AMPT - Amherst #2 138 kV Transmission Line
PROJECT LOCATION:	Amherst, Ohio

Notes for Structure 1006C (Boring B-102):

- Axial side resistance should be ignored in the upper 5 feet of the profile.
- Laterally loaded deep foundations should be designed using the p-y approach using the above-provided parameters.
- Lateral resistance should be ignored in the upper 3.5 feet of the profile due to frost.
- Assume static groundwater table is at a depth of 7.5 feet from the ground surface.
- Submerged (effective) unit weights should be used below the groundwater table to account for effective stresses in the analyses.

GEOTECHNOLOGY
A Universal Engineering Sciences Company

CLIENT: Emerald Energy & Exploration Land Company
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 138 kV Transmission Line
PROJECT LOCATION: Amherst, Ohio

IDEALIZED SOIL & BEDROCK PROFILE
PARAMETERS FOR AXIAL/LATERAL LOAD ANALYSES
FOR STRUCTURE 1006D AND 1006E (BORINGS B-101 AND B-2)

El. (ft.)	Depth (ft.)	
Varies	0.0	Ground Surface
	4.0	Loose Lacustrine Soils (Reese sand model): *Lateral Parameters for LPILE/MFAD* γ = 105 pcf; γ' = 47.6 pcf ϕ = 30° k = 20 pci for submerged conditions and 25 pci above groundwater table E_p = 380 psi *Axial Parameters* $q_{s,all}$ = N/A; $q_{p,all}$ = N/A
	7.0	Very Stiff Glacial Till (stiff clay model): *Lateral Parameters for LPILE/MFAD* γ = 130 pcf; γ' = 72.6 pcf c = 3,000 psf; ε_{50} = 0.005 E_p = 1.8 ksi *Axial Parameters* $q_{s,all}$ = 600 psf; $q_{p,all}$ = 9,000 psf
		Weathered Shale Bedrock with Siltstone: *Lateral Parameters for LPILE (use stiff clay model):* $\gamma = \gamma'$ = 140 pcf c = 4,300 psf; ε_{50} = 0.003 *Lateral Parameters for MFAD* $\gamma = \gamma'$ = 140 pcf; q_u = 60 psi RQD = 40% RMR = 28; E_{RM} = 410 psi c_{RM} = 17 psi; ϕ_{RM} = 32° τ_{ult} = 10 psi *Axial Parameters* $q_{s,all}$ = 470 psf; $q_{p,all}$ = 10,000 psf (12-inch min. bedrock embedment)

Symbol Definition:

γ = Unit weight
γ' = Effective unit weight
c = Cohesion
ε_{50} = Strain at 50% of unconfined compressive strength
E_p = Deformation modulus
$q_{s,all}$ = Allowable side resistance
$q_{p,all}$ = Allowable end/tip resistance
q_u = Uniaxial compressive strength
RQD = Rock quality designation
RMR = Rock mass rating
E_{RM} = Rock mass modulus
c_{RM} = Rock mass cohesion
ϕ_{RM} = Rock mass friction angle
τ_{ult} = Nominal rock-concrete bond strength

Notes:

- Axial side resistance should be ignored in the upper 5 feet of the profile.
- Laterally loaded deep foundations should be designed using the p-y approach using the above-provided parameters.
- Lateral resistance should be ignored in the upper 3.5 feet of the profile due to frost.
- Assume static groundwater table is at the bedrock surface.
- Submerged (effective) unit weights should be used below the groundwater table to account for effective stresses in the analyses.

GEOTECHNOLOGY
A Universal Engineering Sciences Company

November 29, 2021

Mr. Neil Salyer
Emerald Energy & Exploration Land Company
9850 Von Allmen Court
Suite 201
Louisville, Kentucky 40241

Re: Geotechnical Exploration Report - Addendumn No. 1
AMPT - Amherst #2 Transmission Line
Amherst, Ohio
Geotechnology Project No. J037566.01

Dear Mr. Salyer:

This report is Addendum No. 1 to our November 18, 2021 geotechnical report titled "Geotechnical Exploration, AMPT – Amherst #2 Transmission Line, Amherst, Ohio" (November 2021 Report). This addendum includes updated idealized soil and bedrock profiles to replace those provided in Appendix E of the November 2021 Report.

We appreciate the opportunity to provide the geotechnical services for this project. If you have any questions regarding this addendum or the November 2021 Report, or if we may be of any additional service to you, please do not hesitate to contact us.

Respectfully submitted,
GEOTECHNOLOGY, LLC

Joseph D. Hauber, PE
Principal Geotechnical Engineer

JDH:jdh

Copies submitted: Emerald Energy & Exploration Land Company (email)

GEOTECHNOLOGY
A Universal Engineering Sciences Company

CLIENT: Emerald Energy & Exploration Land Company
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 138 kV Transmission Line
PROJECT LOCATION: Amherst, Ohio

IDEALIZED SOIL & BEDROCK PROFILE
PARAMETERS FOR AXIAL/LATERAL LOAD ANALYSES
FOR STRUCTURE 1006B (BORING B-103)

El. (ft.)	Depth (ft.)	
698.0	0.0	Ground Surface
690.5	7.5	Loose to Medium Dense Fill (Reese sand model): *Lateral Parameters for LPILE/MFAD* γ = 120 pcf γ' = 62.6 pcf ϕ = 32° k = 40 pci for submerged conditions and 55 pci above groundwater table E_p = 600 psi *Axial Parameters* $q_{s,all}$ = N/A $q_{p,all}$ = N/A
685.5	12.5	Loose Lacustrine Soils (Reese sand model): *Lateral Parameters for LPILE/MFAD* γ = 105 pcf γ' = 47.6 pcf ϕ = 30° k = 20 pci for submerged conditions and 25 pci above groundwater table E_p = 380 psi *Axial Parameters* $q_{s,all}$ = 265 psf $q_{p,all}$ = N/A
667.5	30.5	Very Stiff Glacial Till (stiff clay model): *Lateral Parameters for LPILE/MFAD* γ = 130 pcf γ' = 72.6 pcf c = 3,000 psf ε_{50} = 0.005 E_p = 1,800 psi *Axial Parameters* $q_{s,all}$ = 600 psf $q_{p,all}$ = 9,000 psf
		Shale and Siltstone Bedrock: *Lateral Parameters for LPILE (use stiff clay model):* $\gamma = \gamma'$ = 145 pcf q_u = 680 psi k_{rm} = 0.0005 RQD = 55% *Lateral Parameters for MFAD* $\gamma = \gamma'$ = 145 pcf q_u = 680 psi RQD = 55% RMR = 34 ***E_{RM} = 580 ksi*** c_{RM} = 19 psi ϕ_{RM} = 34° τ_{ult} = 40 psi *Axial Parameters* $q_{s,all}$ = 1,850 psf $q_{p,all}$ = 65,000 psf (min. bedrock embedment = 1 shaft diameter)

Symbol Definition (see notes on next page):

γ = Unit weight
γ' = Effective unit weight
c = Cohesion
ε_{50} = Strain at 50% of unconfined compressive strength
E_p = Deformation modulus
$q_{s,all}$ = Allowable side resistance
$q_{p,all}$ = Allowable end/tip resistance
q_u = Uniaxial compressive strength
RQD = Rock quality designation
k_{rm} = Bedrock strain factor
RMR = Rock mass rating
E_{RM} = Rock mass modulus
c_{RM} = Rock mass cohesion
ϕ_{RM} = Rock mass friction angle
τ_{ult} = Nominal rock-concrete bond strength

GEOTECHNOLOGY
A Universal Engineering Sciences Company

CLIENT: Emerald Energy & Exploration Land Company
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 138 kV Transmission Line
PROJECT LOCATION: Amherst, Ohio

Notes for Structure 1006B (Boring B-103):

- Axial side resistance should be ignored in the upper 5 feet of the profile.
- Laterally loaded deep foundations should be designed using the p-y approach using the above-provided parameters.
- Assume static groundwater table is at a depth of 20 feet from the ground surface.
- Assume static groundwater table is at the bedrock surface.
- Submerged (effective) unit weights should be used below the groundwater table to account for effective stresses in the analyses.

GEOTECHNOLOGY
A Universal Engineering Sciences Company

CLIENT: Emerald Energy & Exploration Land Company
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 138 kV Transmission Line
PROJECT LOCATION: Amherst, Ohio

IDEALIZED SOIL & BEDROCK PROFILE
PARAMETERS FOR AXIAL/LATERAL LOAD ANALYSES
FOR STRUCTURE 1006C (BORING B-102)

El. (ft.)	Depth (ft.)	
697.0	0.0	Ground Surface
691.0	6.0	Loose Fill (Reese sand model): *Lateral Parameters for LPILE/MFAD* γ = 105 pcf $\quad$ γ' = 47.6 pcf ϕ = 30° k = 20 pci for submerged conditions and 25 pci above groundwater table E_p = 380 psi *Axial Parameters* $q_{s,all}$ = N/A $\quad$ $q_{p,all}$ = N/A
688.5	8.5	Very Loose Lacustrine Soils (Reese sand model): *Lateral Parameters for LPILE/MFAD* γ = 100 pcf $\quad$ γ' = 42.6 pcf ϕ = 28° k = 10 pci for submerged conditions and above groundwater table E_p = 330 psi *Axial Parameters* $q_{s,all}$ = 155 psf $\quad$ $q_{p,all}$ = N/A
661.0	36.0	Very Stiff Glacial Till (stiff clay model): *Lateral Parameters for LPILE/MFAD* γ = 130 pcf $\quad$ γ' = 72.6 pcf c = 3,000 psf $\quad$ ε_{50} = 0.005 E_p = 1.8 ksi *Axial Parameters* $q_{s,all}$ = 600 psf $\quad$ $q_{p,all}$ = 9,000 psf
		Weathered Shale Bedrock with Siltstone: *Lateral Parameters for LPILE (use stiff clay model):* $\gamma = \gamma'$ = 140 pcf c = 4,300 psf $\quad$ ε_{50} = 0.003 *Lateral Parameters for MFAD* $\gamma = \gamma'$ = 140 pcf $\quad$ q_u = 60 psi RQD = 0% RMR = 23 $\quad$ ***E_{RM} = 310 ksi*** c_{RM} = 16 psi $\quad$ ϕ_{RM} = 31° τ_{ult} = 10 psi *Axial Parameters* $q_{s,all}$ = 470 psf $\quad$ $q_{p,all}$ = 10,000 psf (12-inch min. bedrock embedment)

Symbol Definition (see notes on next page):

γ = Unit weight
γ' = Effective unit weight
c = Cohesion
ε_{50} = Strain at 50% of unconfined compressive strength
E_p = Deformation modulus
$q_{s,all}$ = Allowable side resistance
$q_{p,all}$ = Allowable end/tip resistance
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RQD = Rock quality designation
RMR = Rock mass rating
E_{RM} = Rock mass modulus
c_{RM} = Rock mass cohesion
ϕ_{RM} = Rock mass friction angle
τ_{ult} = Nominal rock-concrete bond strength

GEOTECHNOLOGY
A Universal Engineering Sciences Company

CLIENT:	Emerald Energy & Exploration Land Company
PROJECT NO.:	J037566.01
PROJECT:	AMPT - Amherst #2 138 kV Transmission Line
PROJECT LOCATION:	Amherst, Ohio

Notes for Structure 1006C (Boring B-102):

- Axial side resistance should be ignored in the upper 5 feet of the profile.
- Laterally loaded deep foundations should be designed using the p-y approach using the above-provided parameters.
- Lateral resistance should be ignored in the upper 3.5 feet of the profile due to frost.
- Assume static groundwater table is at a depth of 7.5 feet from the ground surface.
- Submerged (effective) unit weights should be used below the groundwater table to account for effective stresses in the analyses.

GEOTECHNOLOGY
A Universal Engineering Sciences Company

CLIENT: Emerald Energy & Exploration Land Company
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 138 kV Transmission Line
PROJECT LOCATION: Amherst, Ohio

IDEALIZED SOIL & BEDROCK PROFILE
PARAMETERS FOR AXIAL/LATERAL LOAD ANALYSES
FOR STRUCTURE 1006D AND 1006E (BORINGS B-101 AND B-2)

El. (ft.)	Depth (ft.)	
Varies	0.0	Ground Surface
	4.0	Loose Lacustrine Soils (Reese sand model): *Lateral Parameters for LPILE/MFAD* γ = 105 pcf; γ' = 47.6 pcf ϕ = 30° k = 20 pci for submerged conditions and 25 pci above groundwater table E_p = 380 psi *Axial Parameters* $q_{s,all}$ = N/A; $q_{p,all}$ = N/A
	7.0	Very Stiff Glacial Till (stiff clay model): *Lateral Parameters for LPILE/MFAD* γ = 130 pcf; γ' = 72.6 pcf c = 3,000 psf; ε_{50} = 0.005 E_p = 1.8 ksi *Axial Parameters* $q_{s,all}$ = 600 psf; $q_{p,all}$ = 9,000 psf
		Weathered Shale Bedrock with Siltstone: *Lateral Parameters for LPILE (use stiff clay model):* $\gamma = \gamma'$ = 140 pcf c = 4,300 psf; ε_{50} = 0.003 *Lateral Parameters for MFAD* $\gamma = \gamma'$ = 140 pcf; q_u = 60 psi RQD = 40% RMR = 28; ***E_{RM} = 410 ksi*** c_{RM} = 17 psi; ϕ_{RM} = 32° τ_{ult} = 10 psi *Axial Parameters* $q_{s,all}$ = 470 psf; $q_{p,all}$ = 10,000 psf (12-inch min. bedrock embedment)

Symbol Definition:

γ = Unit weight
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ε_{50} = Strain at 50% of unconfined compressive strength
E_p = Deformation modulus
$q_{s,all}$ = Allowable side resistance
$q_{p,all}$ = Allowable end/tip resistance
q_u = Uniaxial compressive strength
RQD = Rock quality designation
RMR = Rock mass rating
E_{RM} = Rock mass modulus
c_{RM} = Rock mass cohesion
ϕ_{RM} = Rock mass friction angle
τ_{ult} = Nominal rock-concrete bond strength

Notes:

- Axial side resistance should be ignored in the upper 5 feet of the profile.
- Laterally loaded deep foundations should be designed using the p-y approach using the above-provided parameters.
- Lateral resistance should be ignored in the upper 3.5 feet of the profile due to frost.
- Assume static groundwater table is at the bedrock surface.
- Submerged (effective) unit weights should be used below the groundwater table to account for effective stresses in the analyses.

GEOTECHNOLOGY

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GEOTECHNICAL EXPLORATION
AMPT - AMHERST #2 SUBSTATION EXPANSION
AMHERST, OHIO

Prepared for:

EMERALD ENERGY & EXPLORATION LAND COMPANY
LOUISVILLE, KENTUCKY

Prepared by:

GEOTECHNOLOGY, LLC
ERLANGER, KENTUCKY

Date:

JULY 9, 2021

Geotechnology Project No.:

J037566.01

SAFETY
QUALITY
INTEGRITY
PARTNERSHIP
OPPORTUNITY
RESPONSIVENESS

GEOTECHNOLOGY
A Universal Engineering Sciences Company

July 9, 2021

Mr. Neil Slayer
Emerald Energy & Exploration Land Company
9850 Von Allmen Court
Suite 201
Louisville, Kentucky 40241

Re: Geotechnical Exploration
AMPT - Amherst #2 Substation Expansion
Amherst, Ohio
Geotechnology Project No. J037566.01

Dear Mr. Salyer:

Presented in this report are the results of our geotechnical exploration completed for the proposed expansion of the existing Amherst #2 69kV substation facility in Amherst, Ohio. Our services were performed in general accordance with Phase I of the Base Scope described in our Proposal P037566.01R-1, which was dated April 22, 2021, and signed for authorization on April 30, 2021.

We appreciate the opportunity to provide the geotechnical services for this project. If you have any questions regarding this report, or if we may be of any additional service to you, please do not hesitate to contact us.

Respectfully submitted,
GEOTECHNOLOGY, LLC

Andrew S. Dingler, EI
Project Geotechnical Engineer

Joseph D. Hauber, PE
Principal Geotechnical Engineer

ASD/JDH:asd/jdh

Copies submitted: Emerald Energy & Exploration Land Company (email)

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GEOTECHNOLOGY
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GEOTECHNICAL EXPLORATION
AMPT - AMHERST #2 SUBSTATION EXPANSION
AMHERST, OHIO
July 9, 2021 | Geotechnology Project No. J037566.01

1.0 INTRODUCTION

Geotechnology, LLC (Geotechnology) prepared this geotechnical exploration report for Emerald Energy & Exploration Land Company (E3CO) for the proposed expansion of the existing Amherst #2 69kV substation facility that is located at 1163 Milan Avenue, Amherst, Ohio 44001.

The purposes of the geotechnical exploration were: to evaluate the general subsurface profile at the site and the engineering properties of the soils and bedrock; and to develop recommendations for the geotechnical aspects of the design and construction of the project, as defined in our proposal. Our scope of services included a site reconnaissance, geotechnical borings, laboratory testing, engineering analyses, and preparation of this report.

2.0 PROJECT INFORMATION

The following project information was derived from:

- Correspondence with E3CO and POWER Engineers, Inc. (POWER).

The project will involve a 1.7-acre site, which is split between two parcels to the north of 1163 Milan Avenue, Amherst, Ohio. The project will include the expansion of an existing substation. No information is currently available as to the type or location of equipment for the substation expansion. A transmission line project associated with the substation expansion project is planned for exploration in the fall and will be addressed in a separate report.

Similar to previous projects, we understand that a combination of shallow and deep foundations are being considered to support equipment and the proposed structures; however, loads have not been provided. Based on previous experience, we anticipate that concentrated and strip foundation loads for proposed structures may be as much as 150 kips and 3 kips per linear foot (klf), respectively, and that the axial loads for deep foundations will likely be 40 kips or less per deep foundation element.

Site grading information was not available at the time of this report. However, we understand that the existing detention basin on site will be relocated and filled. Cut and fill depths associated with the relocation of the detention basin are anticipated to be on the order of 10 feet; although, outside of these limits, cuts and fills are anticipated to be up to a couple feet.

3.0 SITE CONDITIONS

The site location and regional topography of the area are shown on the Substation Site Location Plan included in Appendix B.

As previously discussed, the project site involves two parcels: the eastern 1-acre parcel, which contains the existing 110-foot by 130-foot substation, and the western 0.7-acre parcel, which contains an existing detention basin that covers more than half of this parcel. With the exception of the detention basin, both parcels are relatively level with grades varying from El. 692[1] at the southwest corner of the western parcel to El. 686 near the northern end of the eastern parcel. The bottom of the detention basin is around El. 678 with an outlet structure near the southeast corner of the basin, which has an invert around El. 676.6. The side slopes of the basin vary from approximately 2.3 horizontal to 1 vertical (2.3H:1V) to 2.6H:1V based on the provided topography and did not exhibit evidence of sloughing or creep Figure 1.

Figure 1. Detention basin on western parcel with Boring B-3 in the foreground.

4.0 WENNER RESISTIVITY SURVEY

Electrical resistivity surveying is a surface geophysical technique used to determine the apparent resistivity of the subsurface. The method involves inducing current into the subsurface with two current electrodes and measuring the resulting ground voltage using two potential electrodes. Resistivity values are calculated using the field measurements and electrode geometry. For this project, we used the Wenner resistivity array as set forth in ASTM Method G-57 but modified per

[1] The elevations in this report are referenced to North American Vertical Datum of 1988 (NAVD 88) in units of feet, unless noted otherwise.

the criteria indicated as the "C" Test in the project RFP. The Wenner resistivity array involves placing two potential electrodes between two current electrodes on a straight survey line. For each measurement, the distances between adjacent electrodes are equal and referred to as the "A-spacing". The line is expanded by increasing the A-spacing equally, while maintaining the current electrode closest to the existing substation stationary throughout the test (per the "C" Test requirements). This effectively moved the representative data point (array center) down the line away from the substation as the A-spacing was increased. The electrical field and corresponding measurements attain greater depths with greater A-spacings. Wenner array apparent resistivity values are calculated using the following equation:

$$\text{Apparent Resistivity} = 2\pi(\text{A-spacing})(\text{Resistance})$$

Wenner resistivity surveying was performed along two roughly east-west aligned arrays that were approximately perpendicular to the existing substation (Resistivity Survey Lines 1 and 2, respectively). The data were collected using an Advanced Geosciences, Inc. SuperSting R8 earth resistivity meter. Both surveys were conducted with A-spacings of 2, 4, 6, 8, 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100. Recorded resistance data and calculated apparent resistivity values are presented in Appendix D.

5.0 SUBSURFACE EXPLORATION

The subsurface exploration consisted of three borings (numbered B-1 through B-3). The boring locations were selected by us and were staked in the field by us using a handheld Trimble Geo7X GPS unit. The locations of the borings are shown on our Exploration Plan, which is included in Appendix B.

The borings were drilled on May 13 and 14, 2021, with a track-mounted Mobile B-50 drill rig advancing hollow-stem augers, as indicated on the boring logs presented in Appendix C. Sampling of the overburden soils and bedrock was accomplished ahead of the augers at the depths indicated on the boring logs, with either a 2-inch-outside-diameter (O.D.) split-barrel sampler or 3-inch-O.D., thin-walled Shelby tube sampler in general accordance with the procedures outlined by ASTM D1586 and ASTM D1587, respectively. Standard Penetration Tests (SPTs) were performed with the split-barrel sampler to obtain the standard penetration resistance or N-value[2] of the sampled material. Each boring was extended into the bedrock by rock coring with an NQ rock core bit affixed to a double-tube core barrel in general accordance with the procedures outlined by ASTM D2113. Photographs of the recovered rock core samples are included in Appendix C.

[2] The standard penetration resistance, or N-value, is defined as the number of blows required to drive the split-barrel sampler 12 inches with a 140-pound hammer falling 30 inches. Since the split-barrel sampler is driven 18 inches or until refusal, the blows for the first 6 inches are for seating the sampler, and the number of blows for the final 12 inches is the N-value, which is reported as blows per foot (or bpf). Additionally, "refusal" of the split-barrel sampler occurs when the sampler is driven less than 6 inches with 50 blows of the hammer.

Observations for groundwater were made in the borings during drilling, before introducing core water for rock coring, at the completion of drilling, and before backfilling the boring holes.

An engineer from Geotechnology provided technical direction during field exploration, observed drilling and sampling, assisted in obtaining samples, and prepared field logs of the material encountered.

Representative portions of the split-barrel samples were placed in glass jars with lids to preserve the in-situ moisture contents of the samples. The Shelby tubes were capped and taped at their ends to preserve the in-situ moisture contents and densities of the samples, and the tubes were transported and stored in an upright position. The recovered rock core samples were placed in waxed cardboard core boxes. The glass jars, Shelby tubes, and core boxes were marked and labeled in the field for identification when returned to our laboratory.

6.0 LABORATORY REVIEW AND TESTING

Upon completion of the fieldwork, the samples recovered from the borings were transported to our Soil Mechanics Laboratory, where they were visually reviewed and classified by the Principal Geotechnical Engineer.

Laboratory testing was performed on selected soil and rock samples to estimate engineering and index properties. Laboratory testing of the selected soil samples included various combinations of the following tests: moisture content, Atterberg limits, gradation (particle-size) analyses, standard Proctor, and unconfined compression. Moisture content testing and uniaxial compression testing were also performed on selected rock core samples. The results of these tests are summarized in the Tabulation of Laboratory Tests in Appendix E, along with the corresponding laboratory test forms.

The boring logs, which are included in Appendix C, were prepared by the Project Geotechnical Engineer on the basis of the field logs, the visual classification of the soil and bedrock samples in the laboratory, and the laboratory test results. Soil and Rock Classification Sheets are also included in Appendix C, which describe the terms and symbols used on the boring logs. The dashed lines on the boring logs indicate an approximate change in strata as estimated between samples, whereas a solid line indicates that the change in strata occurred within a sample where a more precise measurement could be made. Furthermore, the transition between strata can be abrupt or gradual.

7.0 SUBSURFACE CONDITIONS

7.1 Stratification

Generally, the ground surface was underlain by topsoil, followed by lacustrine sands, then glacial till, and residual soils over the underlying bedrock consisting of shale and siltstone. More specific descriptions of the subsurface strata are provided below, and the boring logs containing detailed material descriptions are located in Appendix C.

7.1.1 Topsoil

Topsoil was encountered at the ground surface in Borings B-1 through B-3. The thickness of the topsoil in these borings varied from 2 to 6 inches.

7.1.2 Lacustrine Soils

Lacustrine soils (or lakebed soils) are sedimentary soils deposited by lakes. According to Pavey et al. (1999), sand and gravel lacustrine soils were deposited as beach ridge deposits around proglacial lakes that were predecessors to Lake Erie. The lacustrine soils were encountered in Borings B-1 and B-2 to depths of 4 to 6 feet below existing grades. These soils were described as grayish brown, brown, or gray, very loose to loose silty sand with occasional soft clay layers. Uncorrected SPT N-values in this stratum generally varied from 3 to 7 blows per foot (bpf) with one sample having an N-value of 15 bpf. This higher N-value was considered anomalous as the sample was noted to be driven against a large piece of gravel seen after the removal of split-barrel sampler. Moisture contents generally ranged from 10 to 22 percent with one sample having a moisture content of 1 percent. A summary of the particle-size analyses on the lacustrine soils are provided in Table 1.

Table 1. Summary of particle-size analysis results of the lacustrine soils.

	Gravel-sized (%)	Sand-sized (%)	Fines (%)[a]
Minimum	0.3	49.8	27.9
Maximum	7.3	71.8	48.8
Average	3.0	61.0	36.0

[a] Fines include clay- and silt-sized particles (i.e., particles passing the No. 200 sieve)

7.1.3 Glacial Soils

Glacial soils (or glacial till) are soils that have been deposited, transported, or reworked in place by the advancement or retreat of a glacier across the area. Glacial till was encountered in each of the borings either beneath the topsoil or the lacustrine soils to depths of 2.5 to 9 feet below existing grade. The glacial till soils in these borings were generally described as gray, brown, and reddish brown, stiff to hard lean clay with varying amounts of sand and gravel. Laboratory testing results on the glacial till are summarized in Table 2.

Table 2. Summary of laboratory test results of the glacial till.

		Samples Tested	Minimum	Maximum
Moisture Content (%)		9	11	21
Dry Unit Weight (pcf)		2	120.3	125.5
Atterberg Limits	**Liquid Limit (%)**	4	29	36
	Plastic Limit (%)		19	22
	Plasticity Index (%)		10	14
Particle-Size Analysis	**Gravel-Sized (%)**	4	0	4
	Sand-Sized (%)		11	28
	Fines (%)		69	89
Standard Proctor Maximum Dry Density (pcf)		1	116.5	
Optimum Moisture Content (%)		1	14.4	
Unconfined Compressive Strength (psf)		2	4,560	6,950

[a] Fines include clay- and silt-sized particles (i.e., particles passing the No. 200 sieve).

7.1.4 Residuum

Residual soils (or residuum) are soils that have formed by the in-situ weathering of the underlying bedrock into a soil. Occasionally, layers of the bedrock (i.e., shale or siltstone layers) may be encountered within the residual soils. Residual soils were encountered beneath the glacial till at depths of 2.5 to 9.0 feet in Borings B-1 and B-3. The residuum in these borings was described as gray, very stiff to hard lean clay with trace bedding. Two samples were tested for moisture contents, ranging from 8 to 11 percent.

7.1.5 Bedrock

The overburden soils at the site are underlain by bedrock consisting of interbedded shale and siltstone layers. Bedrock was encountered in each of the borings at depths of 5 to 12.5 feet below the ground surface.

According to the preliminary bedrock geology map of the Vermilion East, Ohio quadrangle (Larsen and Vorbau 1999), the bedrock underlying the overburden soils belongs to the Berea Sandstone and Bedford Shale, Undivided Formation. Shrake et al. (2011) describe this formation as follows:

- The Berea Sandstone is comprised of sandstone and minor shale that is brown in color and weathers light brown to reddish brown. Bedding is thin to thick, and planar to lenticular. The thickness of this component of the formation typically varies from 5 to 75 feet thick, but is locally 100 to 125 feet thick.

- The Bedford Shale is comprised of shale and interbedded siltstone and sandstone. Coloring is gray to brown and locally reddish brown. Bedding is thin to medium and planar to lenticular. The thickness of this formation is 80 to 180 feet and is locally thin to absent where the Berea Sandstone is thick.

The bedrock encountered in Borings B-1 through B-3 generally appeared to consist of the Bedford Shale component and was described as brown, gray and red, extremely weak shale or brown to gray extremely weak to very weak siltstone. The bedrock was cored in Borings B-1 through B-3. The rock quality designation (RQD)[3] values ranged from 45 to 92 percent, and were 69 percent on average. Four samples of the rock core were subjected to uniaxial compression tests. The results of these tests are summarized in Table 3.

Table 3. Summary of uniaxial compressive strength tests on rock core specimens.

Boring No.	Sample No.	Depth (ft.)	Bedrock Component	Dry Unit Weight (pcf)	Uniaxial Compressive Strength (psi)
B-1	RC-10	26.2-27.8	Interbedded Siltstone and Shale	143.9	131
B-2	RC-8	18.4-19.0	Siltstone	153.3	345
B-3	RC-7	12.0-12.5	Shale	134.8	32
B-3	RC-8	16.6-17.4	Shale	142.4	31

7.2 Groundwater Conditions

As mentioned in Section 5.0, groundwater observations were made in the borings during drilling, and at the completion of drilling before backfilling the boring holes. These measurements are documented on the boring logs in Appendix C and are summarized below in Table 4. In general, groundwater was encountered within the bedrock or as perched groundwater in the granular lacustrine soils overlying the cohesive glacial till.

Based on the groundwater observations and our experience, groundwater seepage is anticipated along the interface between cohesionless and cohesive soils (e.g., between the cohesionless lacustrine and cohesive glacial till soils), along the soil/bedrock interface, and in the saturated zones of the native soils that are within perched groundwater zones. Locally concentrated flow may occur due to saturated layers of native soils (particularly the cohesionless lacustrine soils). Additionally, groundwater levels and seepage amounts are expected to vary with time, location, season of the year, amounts of precipitation.

[3] The rock quality designation (RQD) is defined as the percentage of rock core pieces recovered in lengths longer than 4 inches for the specified interval.

Table 4. Summary of groundwater observations.

Boring	Elevation (feet)		
	Bottom of Boring	Water Level During Drilling[a]	Water Level Upon Completion[a]
B-1	652.5	Trace at 683 672.5	677.0 (Core water)
B-2	666.0	Trace at 683	676.9 after 13 hours (Core water)
B-3	669.0	NE	680.5 (Core water)

[a] Abbreviation: NE = not encountered.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Based on our engineering reconnaissance of the site, the borings, the visual examination of the recovered samples, the laboratory test results, our understanding of the proposed project, our engineering analyses, and our experience as Geotechnical Engineers in Ohio, we have reached the conclusions and make the following recommendations of this report.

8.1 Wenner Resistivity Survey Results

Based on the Wenner resistivity survey discussed in Section 4.0 and presented in Appendix D, the resistivity values for this project appear geologically reasonable. Subsurface conditions, buried objects, and geologic material can yield varying resistivity values for specific A-spacings. Due to the presence of grounded power poles, manholes, and the fence surrounding the existing substation, some recorded resistivity values may have been influenced by these noise sources. In our opinion, survey results should be evaluated based on the overall trends in their respective data sets.

8.2 Excavation Support

Excavation support should be the responsibility of the Contractor. Excavation support should be designed and implemented such that excavations are adequately ventilated and braced, shored, and/or sloped in order to protect and ensure the safety of workers within and near the excavations and to protect adjacent ground, slopes, structures, and infrastructure. Federal, state, and local safety regulations should be satisfied. The analyses, discussions, conclusions, and recommendations throughout this report are not to be interpreted as pre-engineering compliance with any safety regulation.

8.3 Site Preparation and Earthwork

As stated in Section 2.0, we anticipate that earthwork for this project will involve cuts and fills up to a couple of feet, except in the detention pond, where fills on the order of 10 feet are anticipated.

The initial preparation of the site for grading should include the removal of vegetation, heavy root systems, and topsoil from the proposed cut, fill, pavement, and structure areas. The topsoil may be stockpiled for future use in landscaped areas, if permitted by specification, whereas the

vegetation, including the heavy root systems, should be disposed of off site in accordance with applicable regulations.

Following clearing the site of the existing vegetation and topsoil, we recommend that low-density, very soft to medium stiff and/or very loose to loose soils that exist within the proposed structure, pavement, and fill areas be undercut to expose stiff to very stiff native clayey soils. Low-density soils are considered to be compressible and unsuitable to support compacted and tested fills, pavements, or foundations. Note that two of the borings encountered loose to very loose silty sand lacustrine soils beneath the topsoil, which will likely require undercutting. Furthermore, borings were not completed within the bottom of the existing detention basin. We anticipate that the basin likely has a couple to a few feet of soft sediment that has built up over the years, which will require undercutting and may not be suitable for reuse as fill. The organic content of the suspected sediment should be determined to evaluate the potential for reuse of this material. If the organic content of the material is less than 3 percent, it may be reused as part of the engineered fill, provided it satisfies the other criteria for acceptable fill materials presented later in this section. If the organic content of the material exceeds 3 percent, we should be retained to evaluate options for reuse of the material, or the material should be wasted off site or considered for reuse as topsoil.

After the above operations and making the required excavations in the cut areas, the exposed subgrade should be thoroughly proofrolled using a heavily loaded piece of equipment (e.g., a tandem-axle dump truck with a gross weight of at least 40,000 pounds) under the review of the Project Geotechnical Engineer, or a representative thereof. Soft or yielding soils observed during the proofrolling should be undercut to stiff non-yielding cohesive soils or medium dense to dense well-graded cohesionless soils.

Where undercuts are performed, the excavations should be backfilled with new compacted fill satisfying the material and compaction requirements presented in this section. The undercut soils may be reused provided that they conform to the recommendations contained in this report regarding acceptable fill materials. We recommend that the Contract Documents include a bid item for the recommended undercutting, as deemed necessary, and their replacement with new compacted and tested fill on a “per cubic yard of in-place compacted fill” basis.

Experience indicates that the overburden soils can be excavated with conventional earthwork construction equipment (i.e., dozers, hoes, loaders, scrapers, etc.) Where excavations extend into bedrock, which are not anticipated, some ripping may be necessary to loosen and breakup the bedrock so that it can be picked up.

Fill materials should consist of approved on-site, non-organic, clayey soils, bedrock, or approved borrow material that are relatively free of topsoil, vegetation, trash, construction or demolition debris, frozen materials, particles over 6 inches in maximum dimension, or other deleterious materials.

If excavations extend into the bedrock, the shale and siltstone bedrock may be incorporated into the fill provided that the shale is pulverized to a soil-like consistency and moisture-conditioned, and provided that the siltstone component is broken up and dispersed so as not to cause nesting or retard compaction. The maximum dimension of the broken-up siltstone floaters in the fills should be limited to 6 inches. Additionally, bedrock should be restricted from the fill from subgrade elevation to 2 feet below bearing elevations within the footprints of the proposed structures and 10-foot buffer areas around these structures. In pavement areas, we recommend that the bedrock be restricted within 1 foot of subgrade elevations.

The fill should be placed in shallow level lifts (or layers), 6 to 8 inches in loose thickness. Each lift should be moisture-conditioned to within the acceptable moisture content range provided in Table 5, and compacted with a sheepsfoot roller or self-propelled compactor to at least the minimum percent compaction indicated in the same table. Moisture-conditioning may include: aeration and drying of wetter soils; wetting drier soils; and/or thoroughly mixing wetter and drier soils into a uniform mixture. Additionally, if shale is used in the fill, water will likely need to be mixed in with the shale to moisture-condition the shale.

Table 5. Percent compaction and moisture-conditioning requirements for fill and backfill.

Area	Minimum Percent Compaction[a,b]	Acceptable Moisture Content Range[c]
Structural[d] and pavement subgrade	98% of SPMDD	-2% to +3% of OMC
Non-structural	95% of SPMDD	±3% of OMC
Floor slab subgrade	98% of SPMDD	0% to +3% of OMC

[a] SPMDD = standard Proctor maximum dry density determined from ASTM D698.
[b] For granular soils that do not exhibit a well-defined moisture-density relationship, refer to Table 7 for minimum relative density requirements.
[c] OMC = optimum moisture content determined from ASTM D698.
[d] Structural fill and backfill for foundations are defined as fill and backfill located within the zones of influence of structures. The zone of influence of a structure is defined as the area below the footprint of the structure and 2H:1V outward and downward projections from the bearing elevation of the structure.

Where fill is placed on sloping terrain that is steeper than 6H:1V, the fill should be placed on continuous horizontal benches up the sloping terrain with the initial bench having a minimum width of 15 feet and each subsequent bench being at least 5 feet wide. The initial 15-foot-wide bench should be located at the toe of the proposed fill. The benching operations should remove surficial medium stiff or softer soils and expose stiff native soils or undisturbed, intact bedrock on the surfaces of the benches. The benches should not be made until the fill is ready to be placed. If groundwater seepage is noted on the benches, the Project Geotechnical Engineer should be contacted for underdrainage recommendations before the soils are replaced and compacted.

We recommend that the permanent cut and fill slopes for this project be designed not steeper than 3H:1V. Gentler slopes should be used whenever possible for ease of maintenance. Additionally, we recommend that the fill slopes be slightly overbuilt and then trimmed back to the

design slope to achieve a well-compacted surface. Silt and/or sand soils should also be excluded from the surficial 5 feet of the fill slopes, as these materials are more susceptible to erosion.

Topsoil should be track-compacted on the proposed cut and fill slopes. We recommend that a maximum of 6 inches of topsoil be placed on the slopes.

Groundwater is not expected to have a significant adverse effect on the proposed earthwork construction; however, the Contractor must be prepared to remove seepage that accumulates in excavations, on fill surfaces, or at subgrade levels.

Maintaining the moisture content of bearing and subgrade soils within the acceptable range provided in Table 5 is very important during and after construction for the proposed structures. The clayey bearing and subgrade soils should not be allowed to become excessively wet or dried during or after construction, and measures should be taken to prevent water from ponding on these soils and to prevent these soils from desiccating during dry weather.

Positive drainage should be established around the proposed structures to promote the rapid drainage of surface water away from the structures and to prevent the ponding of water adjacent to the structures. Finish grading in grass and landscaped areas should be sloped down and away from the structures at 10 percent for at least 10 feet, and then at a gradient of at least 2 percent beyond the initial 10 feet from the structures. Proposed pavements should drain away from the structures at a minimum of 2 percent. The final grades should direct the surface water to storm water collection systems.

We recommend that the earthwork operations be carried out during the drier season of the year and that a sufficient gradient be maintained at the ground surface to prevent ponding of surface water. In our experience, the weather conditions are historically more favorable for earthwork during the months of May through October in Ohio. Regardless of the time of year, asphalt, concrete, or fill should not be placed over frozen or saturated soils, and frozen or saturated soils should not be used as compacted fill or backfill.

Best management practices (BMPs) should be implemented to reduce the effects of erosion and the siltation of adjacent properties. Upon completion of earthwork, disturbed areas should be stabilized. It is also recommended that riprap and/or suitable armoring be used at the outlets of storm sewers and headwalls to reduce flow velocities and protect against erosion.

8.4 Seismic Site Classification

Based on the borings and our interpretation of the 2018 International Building Code (2018 IBC), it is our opinion that Site Class D is applicable for this project site as it exists currently. If the recommendations of this report are followed and the surficial loose sands are undercut and replaced with compacted and tested fill, then it is our opinion that the site class may be improved to Site Class C.

8.5 Foundation Design and Construction

8.5.1 Shallow Foundations

Based on the assumed maximum foundation loads discussed in Section 2.0 (i.e., 150-kip concentrated loads and 3-klf strip loads) shallow foundations (i.e., spread footings, column pads, or mat foundations) may bear in new compacted and tested fill or the stiff to hard native glacial till soils, after penetrating through the very loose to loose alluvial soils. The shallow foundations may be proportioned for a maximum net allowable bearing pressure of 3,000 psf, full dead and full live load. We recommend that the minimum lateral dimensions for continuous wall footings and isolated column footings be at least 18 and 24 inches, respectively.

Footings should bear at least 42 inches below the proposed grade for protection from frost penetration. Additionally, the foundation bearing elevations should not be located higher than a relationship of 2H:1V above proposed adjacent foundations or the inverts of nearby existing or proposed utilities that parallel or nearly parallel the foundations, without a site-specific evaluation of the conditions by the Project Geotechnical Engineer.

Where shallow foundations will be subjected to lateral loads, resistance to overturning and sliding may be evaluated using the parameters provided in Table 6. Furthermore, lateral resistance to sliding may be provided by a combination of friction and passive resistance; however, passive resistance should be ignored above the frost penetration depth of 42 inches. It also should be noted that the passive resistance parameters assume a level ground surface. If proposed grading will result in the ground sloping down and away from the foundation in the area of passive resistance, we should be contacted to provide site-specific parameters.

Table 6. Design parameters for laterally loaded shallow foundations.

Soil unit weight, γ (pcf)	125
Internal angle of friction, ϕ (°)	28
Cohesion, c (psf)	0
Ultimate coefficient of static friction, μ_{ult}	0.35 for concrete cast on stiff in-situ clayey soils
Ultimate passive resistance, σ_p (psf)[a]	2,500

[a] Passive resistance may be considered where concrete is cast against free-standing vertical faces of stiff controlled fill or native soils; however, passive resistance should be ignored in the upper 42 inches below proposed grade due to seasonal variations in moisture and frost penetration. If the ground is sloping down and away from the foundation in the area of passive resistance, we should be contacted to provide site-specific recommendations.

We recommend that shallow foundation excavations be cut to neat lines and grades so that concrete may be placed directly against the banks of the excavations without forming. Loose, soft, wet, frozen, or otherwise disturbed materials should be removed from the bearing surfaces of the foundations prior to the placement of reinforcing steel and concrete. If a crusted or saturated surface develops at the bearing surface for a foundation, we recommend that it be skimmed to

expose a fresh surface before reinforcing steel and concrete are placed. Foundation concrete should be placed the same day as the excavation is made to prevent saturation or desiccation of the bearing surfaces.

Concrete mud mats may be placed over the bearing surfaces to protect the bearing materials from desiccation or softening via saturation. If concrete mud mats are utilized, the concrete should have a minimum compressive strength of 1,500 psi and a minimum thickness of 3 inches. The excavated bearing surface should be lowered at least the thickness of the mud mat, and the top of the mud mat should be at or below the design bearing elevation of the foundation. Prior to the placement of the concrete mud mat, the bearing surfaces should be cleaned of loose, soft, wet, frozen, or otherwise disturbed material.

Water should not be allowed to pond on top of either bearing soils within footing excavations, or on or around completed footings, in order to reduce potential softening or swelling of the bearing materials.

We recommend that foundation steps have a maximum height of 2 feet and a corresponding minimum length of 4 feet. Reinforcing steel and concrete should remain continuous through the foundation steps.

We recommend that foundation excavations be reviewed by the Project Geotechnical Engineer, or a representative thereof, prior to placing concrete in order to confirm that the bearing materials and surfaces are consistent with the design recommendations of this report.

8.5.2 Drilled Shaft Foundations

Based on the soil profile, we recommend cast-in-place reinforced concrete drilled shafts where deep foundations are needed. Axial resistance for the drilled shafts may be provided by a combination of end resistance and side resistance. The idealized soil and bedrock profiles provided in Appendix F provides the recommended values for allowable end and side resistance for the different subsurface layers. One profile is provided for the existing detention basin assuming that the sediments are undercut and the basin is backfilled with new compacted and tested fill, and another profile is provided based on the native lacustrine soils not being undercut outside the limits of the existing detention basin. We recommend that drilled shafts bear at least 3 times the shaft diameter below the ground surface and grade beams, where applicable.

We recommend that the minimum center-to-center spacing of the drilled shafts be 3 times their diameter, unless group effects are accounted for in their axial design.

Where drilled shafts will be supporting lateral loads, the drilled shafts should be designed using a p-y approach. The idealized soil and bedrock profiles provided in in Appendix F provides the p-y parameters for LPile and MFAD (Moment Foundation Analysis Design) for the different subsurface layers. It is noted that a stiff clay model in LPile is recommended for the bedrock on the basis of its weak strength (unconfined compressive strength less than 100 psi).

Similar to the discussion in Section 8.5.1 on passive resistance for shallow foundations, lateral resistance for deep foundations should be ignored above the frost line (i.e., above a depth of 42 inches from the ground surface).

Where the spacing of laterally loaded deep foundations will be close enough that their areas of resistance overlap, we recommend that an appropriate p-multiplier be applied in the analyses to account for the overlap and reduction in lateral resistance. For piles spaced closer than 3.75 times the pile diameter or width and where the direction of pile spacing will be perpendicular to the load direction, we recommend that the p-multiplier (p_m) be defined by the empirical relationship presented in Reese et al. (2006):

$$p_m = 0.64(S/D)^{0.34} \leq 1.0$$

where S is the pile spacing and D is the pile diameter or width. For piles where the direction of pile spacing will be parallel to the load direction, the p-multipliers should be per Table 10.7.2.4-1 from the *AASHTO LRFD Bridge Design Specifications* (AASHTO 2020).

The drilled shaft excavations should be made straight and plumb with level bottoms, using dry construction methods. Loose, soft, wet, or otherwise disturbed materials should be removed from the bearing surfaces to expose the design end bearing materials before the reinforcing steel and concrete are placed. Concrete should not be placed through more than 3 inches of water in the bottom of any shaft, and the rate of inflow of groundwater should be less than 12 inches per hour, unless wet construction methods are implemented. We recommend that each drilled shaft excavation be reviewed by the Project Geotechnical Engineer, or a representative thereof, to confirm that the soil and/or bedrock conditions encountered within the drilled shaft are consistent with those encountered in the borings and with the design recommendations of this report.

Although not anticipated based on the boring information, full-depth temporary casing from the ground surface to the top of bedrock may be needed to control groundwater and/or caving overburden soils. We recommend that the Contract Documents include a bid item for casing shafts as recommended by the Project Geotechnical Engineer, or the representative thereof, on a “cost per cased shaft” basis.

Bottoms of grade beams should extend 42 inches below proposed exterior grades. Similar to the shallow foundations, grade beams between drilled shafts should be excavated to neat lines and grades so that concrete may be placed directly against the banks of the excavations without forming. If the excavation becomes desiccated prior to placement of concrete, the sides and bottoms of the excavation should be trimmed to expose fresh, moist soils to reduce the potential of the desiccated soils absorbing water and swelling, resulting in uplift pressures on the grade beams.

8.6 Utility Construction

We anticipate that select granular backfill will be used as pipe bedding and pipe zone backfill for the utilities. We recommend that the granular backfill be limited to the pipe bedding and minimum required pipe/utility cover. The remainder of the utility trenches should be backfilled with flowable

fill or compacted clayey soils up to design subgrade elevation to reduce the potential for water collecting in these trenches and being absorbed by the surrounding clays.

Granular bedding and backfill that exhibits a well-defined moisture-density relationship should be compacted and moisture-conditioned per the requirements presented in Table 5; otherwise, the granular material should be compacted to at least the minimum relative densities indicated in Table 7.

Table 7. Relative density compaction requirements for granular fill and backfill.

Area	Minimum Relative Density[a,b]
Structural[c]	80%
Non-structural	75%
Floor slab and pavement subbase	80%

[a] Relative density evaluated on the basis of the maximum and minimum index densities determined from ASTM D4253 and D4254, respectively.
[b] For granular soils that exhibit a well-defined moisture-density relationship, refer to Table 5 on page 10 for minimum percent compaction and moisture-conditioning requirements.
[c] Structural fill and backfill for foundations are defined as fill and backfill located within the zones of influence of structures. The zone of influence of a structure is defined as the area below the footprint of the structure and 2H:1V outward and downward projections from the bearing elevation of the structure.

Utility trench backfill should be placed in 6- to 8-inch-thick lifts with each lift compacted to at least the specified degree of compaction. Under no circumstances should the backfill be flushed in an attempt to obtain compaction.

If flowable fill is used, it should have a design strength of at least 30 psi for stability and not greater than 100 psi for future excavatability.

Prior to placing the bedding and utilities within the utility trench, soft, saturated, and compressible material should be removed from the bottom of the trench, exposing moist stiff soils.

8.7 Floor Slab

We anticipate that the floor slabs for buildings will be designed as slab-on-grade concrete. The concrete floor slab thicknesses should be designed based on the stiff native glacial till or compacted and tested, stiff soils at this site providing a modulus of subgrade reaction (k) of 125 pounds per cubic inch (pci) for point loads[4].

We recommend that the floor slab be underlain by a minimum 4-inch-thick subbase layer of dense-graded aggregate (DGA, also referred to as ODOT 304) to serve as a capillary break and

[4] For large area loads, the modulus of subgrade reaction would be lower, and settlement analyses would need to be completed to develop a specific modulus value for such loads.

reduce the potential for groundwater rising beneath and into the floor slab from the clayey subgrade via capillary action. The DGA subbase should be compacted per the requirements presented in Table 5. Immediately prior to placement of the granular base, we recommend that the top 8 inches of clayey floor slab subgrade be compacted and moisture-conditioned per the requirements presented in Table 5.

Additionally, we recommend that a vapor retarder/barrier be provided between the floor slab and the subbase where moisture-sensitive floor coverings will be applied to the floors, where moisture-sensitive products/packaging will be stored in direct contact with the floors, and where the humidity of the enclosed space is a concern. The effects of the vapor barrier on curling of the concrete floor slab should be considered in the mix design and placement of the concrete floor slab.

Care should be taken during slab-on-grade construction to not allow the subgrade to become desiccated or saturated. Additionally, consideration should be given to the timing of construction relative to the time of year and weather.

It is recommended that control joints be provided within the concrete slab-on-grade floors. These joints should be sealed to mitigate surface water infiltration until the building is enclosed. We recommend that the floor slab be structurally separated from walls, columns, footings, and penetrations to allow independent movement of the floor.

8.8 Pavement Design and Construction

Pavements for this project should be designed in accordance with expected axle loads, frequency of loading, and the properties of the subgrade. A California Bearing Ratio (CBR) value of 3 should be assumed in the pavement design for subgrade prepared per the recommendations in this report.

Proposed pavement subgrades should be proofrolled with a heavily loaded piece of equipment (e.g., a tandem-axle dump truck with a gross weight of at least 40,000 pounds) under the review of the Project Geotechnical Engineer, or representative thereof. Soft or yielding soils observed during the proofroll should be undercut to stiff, non-yielding soils; however, the depth of undercut below subgrade may be limited to 3 feet in light-duty traffic areas and 4 feet in heavy-duty traffic areas. The undercut should be backfilled with new compacted fill satisfying the material and compaction requirements presented in Section 8.3. We recommend that the Contract Documents include an item for undercutting unsuitable soils and replacing them with new compacted and tested fill on a “per cubic yard of compacted replacement fill” basis.

If soft or yielding soils are encountered at the maximum undercut depths specified above (i.e., 3 feet) and the compaction requirements of the undercut backfill cannot be achieved at the bottom of the undercut, the subgrade may be stabilized at those depths using a biaxial or triaxial geogrid (e.g., Tensar BX-1200 or TriAx TX160) and an 8-inch lift of compacted crushed stone. The remainder of the undercut should be backfilled with dense-graded aggregate or clayey soils satisfying the material and compaction requirements presented in Section 8.3. If clayey soils are

used, a separation geotextile should be provided at the interface between the crushed stone and the clayey soils.

In lieu of undercutting soft or yielding soils to the maximum undercut depths specified above (i.e., 3 feet for light-duty traffic and 4 feet for heavy-duty traffic), the subgrade may be stabilized using a biaxial or triaxial geogrid (e.g., Tensar BX-1200 or TriAx TX160) and at least 12 inches of compacted crushed stone. We recommend that the thickness of undercut and compacted crushed stone be field-evaluated based on the conditions encountered during construction and using a test section. This alternative should also be considered if weather, other site conditions, or the project schedule make earthwork activities with clayey soils impractical.

Prior to the placement of pavement or aggregate base, where provided, we recommend that the top 8 inches of clayey subgrade be scarified and recompacted per the requirements presented in Table 5.

If the proposed pavement section includes an aggregate base, we recommend that caution be exercised so that the proposed aggregate base does not become saturated during or after construction. Water trapped in the aggregate base is capable of freezing, causing it to expand within the voids it occupies. Consequently, ice lenses may form and potentially heave the pavement. Furthermore, the thawing process can soften underlying cohesive subgrades, which reduces the pavement support provided by the subgrade, giving rise to “pumping” of the pavements under loads. Preferably, the aggregate base should be a free-draining material with provisions for draining the base through a system of underdrains.

Surface drainage should be directed away from the edges of proposed or existing pavements so that water does not pond next to pavements or flow onto pavements from unpaved areas. Such ponding or flow can cause deterioration of pavement subgrades and premature failure of pavements. If drainage ditches are used to intercept surface water before it reaches the pavements, the ditches should have an invert at least 6 inches below the pavement subgrade, and have a sufficient longitudinal gradient to rapidly drain the ditches and prevent ponding of water. In those areas where exterior grades do not fully slope away from the edges of the proposed pavement, we recommend that edge drains be installed along the perimeter of the pavement.

If dumpsters are utilized at the project site, we recommend that the dumpster be supported on concrete slabs and that the slabs be sized to accommodate the loading wheels of the dumpster truck. The access lane to the dumpster should also be designed for the heavier wheel loads associated with dumpster trucks.

9.0 RECOMMENDED ADDITIONAL SERVICES

The conclusions and recommendations given in this report are based on: Geotechnology’s understanding of the proposed design and construction, as outlined in this report; site observations; interpretation of the exploration data; and our experience. Since the intent of the design recommendations is best understood by Geotechnology, we recommend that

Geotechnology be included in the final design and construction process, and be retained to review the project plans and specifications to confirm that the recommendations given in this report have been correctly implemented. We recommend that Geotechnology be retained to participate in prebid and preconstruction conferences to reduce the risk of misinterpretation of the conclusions and recommendations in this report relative to the proposed construction of the subject project.

Since actual subsurface conditions between boring locations may vary from those encountered in the borings, our design recommendations are subject to adjustment in the field based on the subsurface conditions encountered during construction. Therefore, we recommend that Geotechnology be retained to provide construction observation services as a continuation of the design process to confirm the recommendations in this report and to revise them accordingly to accommodate differing subsurface conditions. Construction observation is intended to enhance compliance with project plans and specifications. It is not insurance, nor does it constitute a warranty or guarantee of any type. Regardless of construction observation, contractors, suppliers, and others are solely responsible for the quality of their work and for adhering to plans and specifications.

10.0 LIMITATIONS

This report has been prepared on behalf of, and for the exclusive use of, Emerald Energy & Exploration Land Company for specific application to the named project as described herein. If this report is provided to other parties, it should be provided in its entirety with all supplementary information. In addition, Emerald Energy & Exploration Land Company should make it clear that the information is provided for factual data only, and not as a warranty of subsurface conditions presented in this report.

Geotechnology has attempted to conduct the services reported herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions. The recommendations and conclusions contained in this report are professional opinions. The report is not a bidding document and should not be used for that purpose.

Our scope for this phase of the project did not include any environmental assessment or investigation for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors noted or unusual or suspicious items or conditions observed are strictly for the information of our client. Our scope did not include an assessment of the effects of flooding and erosion of creeks or rivers adjacent to or on the project site.

The analyses, conclusions, and recommendations contained in this report are based on the data obtained from the subsurface exploration. The field exploration methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Consequently, subsurface conditions may vary gradually, abruptly, and/or nonlinearly between sample locations and/or intervals.

The conclusions or recommendations presented in this report should not be used without Geotechnology's review and assessment if the nature, design, or location of the facilities is changed, if there is a substantial lapse in time between the submittal of this report and the start of work at the site, or if there is a substantial interruption or delay during work at the site. If changes are contemplated or delays occur, Geotechnology must be allowed to review them to assess their impact on the findings, conclusions, and/or design recommendations given in this report. Geotechnology will not be responsible for any claims, damages, or liability associated with any other party's interpretations of the subsurface data or with reuse of the subsurface data or engineering analyses in this report.

The recommendations included in this report have been based in part on assumptions about variations in site stratigraphy that may be evaluated further during earthwork and foundation construction. Geotechnology should be retained to perform construction observation and continue its geotechnical engineering service using observational methods. Geotechnology cannot assume liability for the adequacy of its recommendations when they are used in the field without Geotechnology being retained to observe construction.

A copy of "Important Information about This Geotechnical-Engineering Report" that is published by the Geotechnical Business Council (GBC) of the Geoprofessional Business Association (GBA) is included in Appendix A for your review. The publication discusses some other limitations, as well as ways to manage risk associated with subsurface conditions.

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APPENDIX A – IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

APPENDIX B – PLANS

Substation Site Location Plan, Sheet No. 1

Substation Exploration Plan, Sheet No. 2

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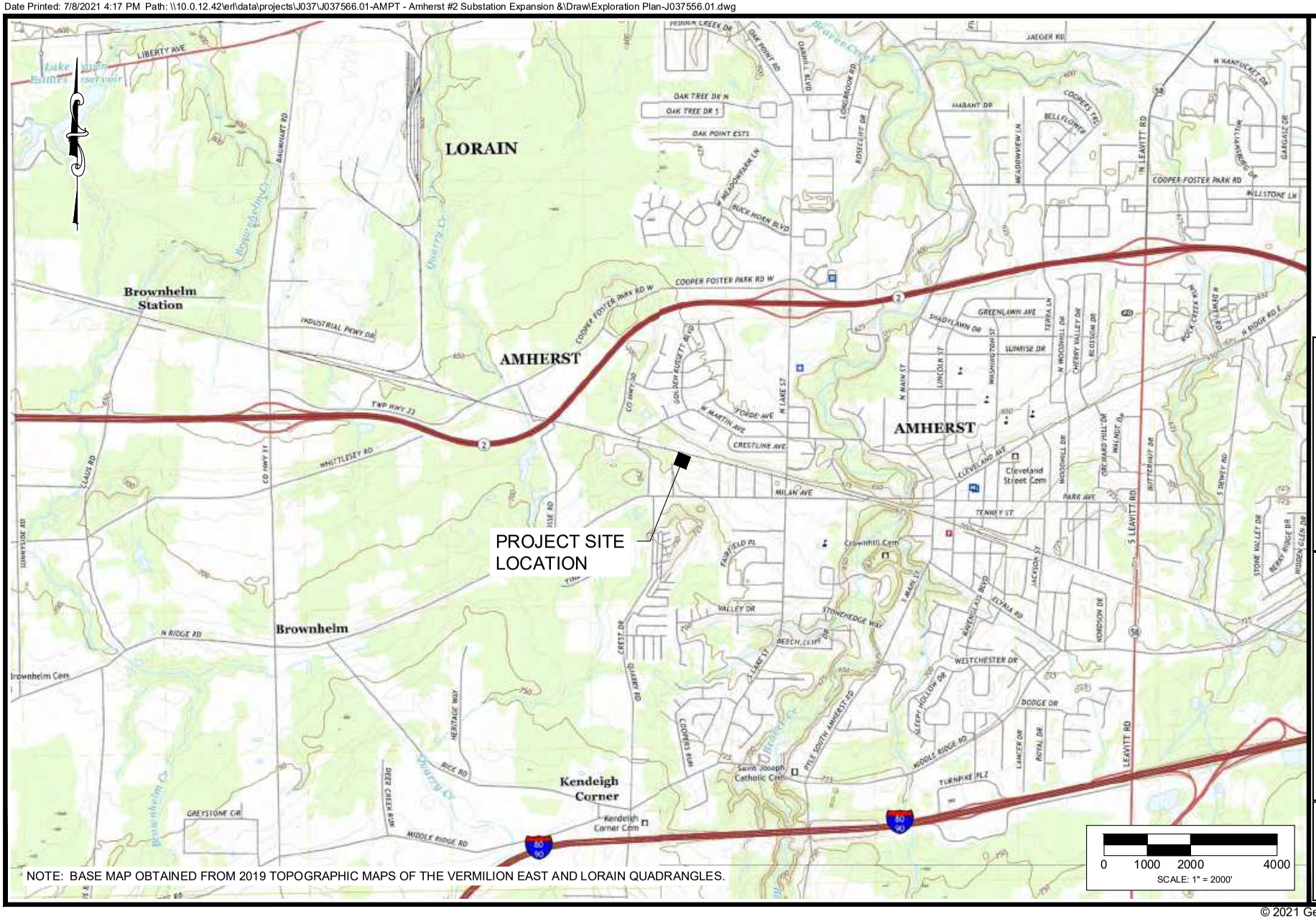

NOTE: BASE MAP OBTAINED FROM 2019 TOPOGRAPHIC MAPS OF THE VERMILION EAST AND LORAIN QUADRANGLES.

GEOTECHNOLOGY

Project: AMPT- AMHERST #2 SUBSTATION EXPANSION

Location: AMHERST, OHIO

Title: SUBSTATION SITE LOCATION PLAN

Client: EMERALD ENERGY & EXPLORATION LAND COMPANY

Date: 7/8/2021

Project No.: J037566.01

Sheet No.: 1

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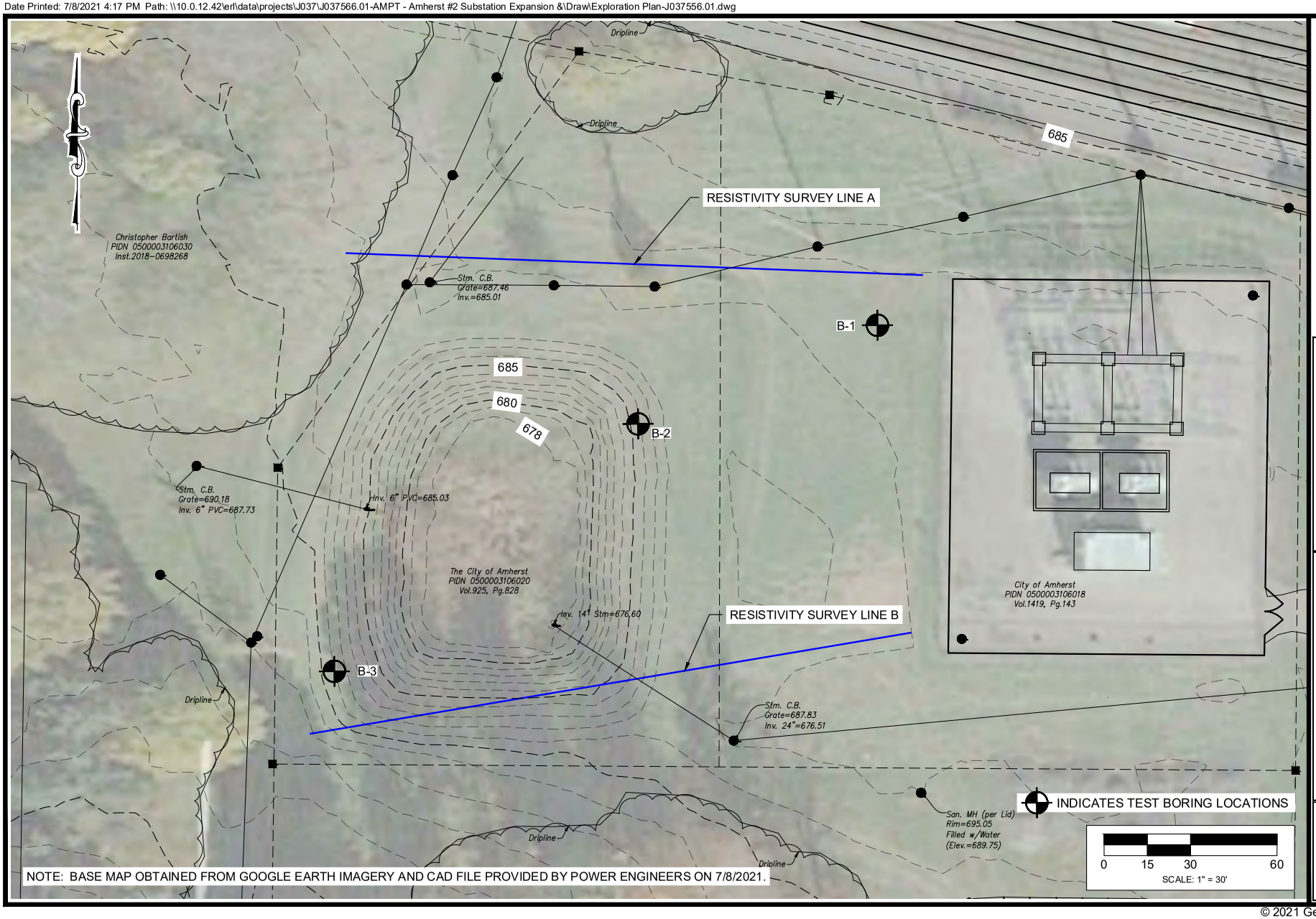


NOTE: BASE MAP OBTAINED FROM GOOGLE EARTH IMAGERY AND CAD FILE PROVIDED BY POWER ENGINEERS ON 7/8/2021.

GEOTECHNOLOGY

Project: AMPT- AMHERST #2 SUBSTATION EXPANSION

Location: AMHERST, OHIO

Title: SUBSTATION EXPLORATION PLAN

Client: EMERALD ENERGY & EXPLORATION LAND COMPANY

Date: 7/8/2021

Project No.: J037566.01

Sheet No.: 2

APPENDIX C – BORING INFORMATION

Boring Logs

Soil Classification Sheet

Rock Classification Sheet

Rock Core Photographs

GEOTECHNOLOGY
A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: Emerald Energy & Exploration Land Company
BORING #: B-1
PROJECT: AMPT - Amherst #2 Substation Expansion
PROJECT #: J037566.01
Amherst, Ohio
PAGE #: 1 of 1
LOCATION OF BORING: As shown on Substation Exploration Plan

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
687.5	Ground Surface	0.0	0							
687.0	TOPSOIL (6 inches)	0.5		I	1	SS	2-9-6	13	72	
684.5	Brown moist medium dense silty SAND (lacustrine).	3.0		I	2	SS	3-3-3	13	72	
				I	3	SS	2-2-3	13	72	
681.5	Brown and gray moist loose to very loose silty SAND (lacustrine).	6.0	5	I	4	SS	2-2-1	13	72	
				I	5	SS	1-4-7	16	89	2.0
678.5	Gray and brown and reddish brown moist stiff to hard LEAN CLAY with sand, trace gravel (glacial till) (CL).	9.0		I	6	SS	3-8-13	18	100	>4.5
675.0	Brown and gray moist very stiff to hard LEAN CLAY with relict bedding (residuum).	12.5	10	I	7	SS	10-17-14	11	61	
670.0	Reddish brown moist extremely weak weathered fissile SHALE with siltstone interbeds (bedrock).	17.5	15	I	8	SS	21-50/1"	5	71	
662.5	Gray slightly moist extremely weak fissile SHALE (bedrock).	25.0	20	I	9	SS	36-50/1"	6	86	
658.9	Interbedded gray slightly moist extremely weak SILTSTONE and SHALE, thinly laminated, medium bedded, fissile (Berea Sandstone and Bedford Shale, Undivided) (bedrock).	28.6	25	I	10	RC	RQD=74%	59	98	
652.5	Interbedded reddish brown slightly moist extremely weak SHALE and SILTSTONE, thinly laminated, thin bedded, fissile (Berea Sandstone and Bedford Shale, Undivided) (bedrock).	35.0	30	I	11	RC	RQD=45%	60	100	
	Bottom of test boring at 35.0 feet.		35							
			40							

Datum: NAVD 88
Hammer Weight: 140 lb.
Hole Diameter: 8 in.
Drill Rig: Mobile B57
Surface Elevation: 687.5 ft. +/-
Hammer Drop: 30 in.
Rock Core Diameter: 1.875 in.
Foreman: A. Unverzagt
Date Started: 5/13/2021
Pipe Size: 2 in. O.D.
Boring Method: HSA-3.25
Engineer: Andrew S. Dingler
Date Completed: 5/13/2021

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: Trace @ 4.5 ft., 15.0 ft.
At Completion: Core Water 10.5 ft., Caved @
After:
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY
A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: Emerald Energy & Exploration Land Company
BORING #: B-2
PROJECT: AMPT - Amherst #2 Substation Expansion
PROJECT #: J037566.01
Amherst, Ohio
PAGE #: 1 of 1
LOCATION OF BORING: As shown on Substation Exploration Plan

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
686.0	Ground Surface	0.0	0							
685.5	TOPSOIL (6 inches)	0.5		I	1	SS	2-3-3	14	78	
	Brown moist loose silty SAND (lacustrine).			I	2	SS	2-3-2	13	72	
683.0		3.0								
682.0	Grayish brown wet loose silty SAND with soft clay layers (lacustrine).	4.0		I	3A 3B	SS	2-4-3	15	83	>4.5
	Gray moist very stiff LEAN CLAY with sand, trace gravel (glacial till) (CL).		5	I	4	ST		13	72	3.25
679.5		6.5								
	Gray and reddish brown slightly moist extremely weak weathered SHALE (bedrock).			I	5	SS	11-26-50/5"	16	94	
				I	6	SS	22-50/2	8	44	
676.0		10.0	10							
	Brown and gray moist extremely weak weathered SHALE, thinly laminated fissile (Berea Sandstone and Bedford Shale, Undivided).			I	7	RC	RQD=78%	55	92	
671.0		15.0	15							
	Gray moist extremely weak SHALE and gray slightly moist very weak SILTSTONE (Berea Sandstone and Bedford Shale, Undivided) (bedrock).			I	8	RC	RQD=65%	60	100	
666.0		20.0	20							
	Bottom of test boring at 20.0 feet.		25							
			30							

Datum: NAVD 88
Hammer Weight: 140 lb.
Hole Diameter: 8 in.
Drill Rig: Mobile B57
Surface Elevation: 686.0 ft. +/-
Hammer Drop: 30 in.
Rock Core Diameter: 1.875 in.
Foreman: A. Unverzagt
Date Started: 5/13/2021
Pipe Size: 2 in. O.D.
Boring Method: HSA-3.25
Engineer: Andrew S. Dingler
Date Completed: 5/13/2021

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH

First Noted	Trace @ 3.0 ft.
At Completion	Core Water
After	13 hrs. 9.1 ft.
Backfilled	13 hrs.

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY
A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: Emerald Energy & Exploration Land Company
BORING #: B-3
PROJECT: AMPT - Amherst #2 Substation Expansion
PROJECT #: J037566.01
Amherst, Ohio
PAGE #: 1 of 1
LOCATION OF BORING: As shown on Substation Exploration Plan

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
689.0	Ground Surface	0.0	0							
688.8	TOPSOIL (2 inches)	0.2		I	1	SS	1-2-4	17	94	3.0
686.5	Grayish brown moist very stiff LEAN CLAY with sand, trace gravel (glacial till) (CL).	2.5		I	2	ST		19	79	2.75
684.0	Brown and gray very stiff to hard LEAN CLAY, trace bedding (residuum).	5.0		I	3	SS	8-12-50/2"	7	50	>4.5
			5	I	4	SS	17-28-50/4"	16	100	
681.0	Gray and reddish brown moist extremely weak fissile weathered SHALE (bedrock).	8.0		I	5	SS	14-32-50/2"	10	71	
679.2	Reddish brown moist extremely weak fissile weathered SHALE (bedrock)	9.8		I	6	SS	19-50/5"	10	91	
678.8	Gray moist extremely weak weathered SHALE, fissile (Berea Sandstone and Bedford Shale, Undivided) (bedrock).	10.3	10							
674.0	Reddish brown moist extremely weak weathered SHALE, fissile (Berea Sandstone and Bedford Shale, Undivided) (bedrock).	15.0		I	7	RC	RQD=92%	39	65	
669.0	Reddish brown moist extremely weak weathered SHALE, fissile (Berea Sandstone and Bedford Shale, Undivided) (bedrock).	20.0	15	I	8	RC	RQD=58%	47	78	
	Bottom of test boring at 20.0 feet.		20							
			25							
			30							

Datum: NAVD 88
Hammer Weight: 140 lb.
Hole Diameter: 8 in.
Drill Rig: Mobile B57
Surface Elevation: 689.0 ft. +/-
Hammer Drop: 30 in.
Rock Core Diameter: 1.875 in.
Foreman: A. Unverzagt
Date Started: 5/14/2021
Pipe Size: 2 in. O.D.
Boring Method: HSA-3.25
Engineer: Andrew S. Dingler
Date Completed: 5/14/2021

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: Core Water
At Completion: Core Water @ 8.5 ft.
After:
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY
A Universal Engineering Sciences Company

SOIL CLASSIFICATION SHEET

NON COHESIVE SOILS
(Silt, Sand, Gravel and Combinations)

Density

Very Loose	- 4 blows/ft. or less
Loose	- 5 to 10 blows/ft.
Medium Dense	- 11 to 30 blows/ft.
Dense	- 31 to 50 blows/ft.
Very Dense	- 51 blows/ft. or more

Relative Properties

Descriptive Term	Percent
Trace	1 – 10
Little	11 – 20
Some	21 – 35
And	36 – 50

Particle Size Identification

Boulders	- 8 inch diameter or more	
Cobbles	- 3 to 8 inch diameter	
Gravel	- Coarse	- 3/4 to 3 inches
	- Fine	- 3/16 to 3/4 inches
Sand	- Coarse	- 2mm to 5mm (dia. of pencil lead)
	- Medium	- 0.45mm to 2mm (dia. of broom straw)
	- Fine	- 0.075mm to 0.45mm (dia. of human hair)
Silt		- 0.005mm to 0.075mm (Cannot see particles)

COHESIVE SOILS
(Clay, Silt and Combinations)

Consistency	Field Identification	Unconfined Compressive Strength (tons/sq. ft.)
Very Soft	Easily penetrated several inches by fist	Less than 0.25
Soft	Easily penetrated several inches by thumb	0.25 – 0.5
Medium Stiff	Can be penetrated several inches by thumb with moderate effort	0.5 – 1.0
Stiff	Readily indented by thumb but penetrated only with great effort	1.0 – 2.0
Very Stiff	Readily indented by thumbnail	2.0 – 4.0
Hard	Indented with difficulty by thumbnail	Over 4.0

Classification on logs are made by visual inspection.

Standard Penetration Test – Driving a 2.0" O.D., 1 3/8" I.D., sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the tests are recorded for each 6 inches of penetration on the drill log (Example – 6/8/9). The standard penetration test results can be obtained by adding the last two figures (i.e. 8+9=17 blows/ft.). Refusal is defined as greater than 50 blows for 6 inches or less penetration.

Strata Changes – In the column "Soil Descriptions" on the drill log, the horizontal lines represent strata changes. A solid line (————) represents an actually observed change; a dashed line (— — — —) represents an estimated change.

Groundwater observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., may cause changes in the water levels indicated on the logs.

GEOTECHNOLOGY
A Universal Engineering Sciences Company

ROCK CLASSIFICATION SHEET

ROCK WEATHERING

Descriptions	Field Identification
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than it its fresh condition.
Highly Weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Residual Soil	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact with bedding planes visible, and the soil has not been significantly transported.

ROCK STRENGTH

Descriptions	Field Identification	Uniaxial Compressive Strength (psi)
Extremely Weak	Indented by thumbnail	40-150
Very Weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife.	150-700
Weak	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer.	700-4,000
Medium Strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with a single blow of a geological hammer.	4,000-7,000
Strong	Specimen requires more than one blow of a geological hammer to fracture.	7,000-15,000
Very Strong	Specimen requires many blows with a geological hammer to fracture.	15,000-36,000
Extremely Strong	Specimen can only be chipped with geological hammer.	>36,000

BEDDING

Descriptive Term	Bed Thickness
Massive	> 4 ft.
Thick	2 to 4 ft.
Medium	2 in. to 2 ft.
Thin	< 2 in.

Rock Core Photograph 1. Boring B-1, Core Runs RC-10 and RC-11 (25 to 35 feet deep).

Rock Core Photograph 2. Boring B-2, Core Runs RC-7 and RC-8 (10 to 20 feet deep).

Rock Core Photograph 3. Boring B-3, Core Runs RC-7 and RC-8 (10 to 20 feet deep).

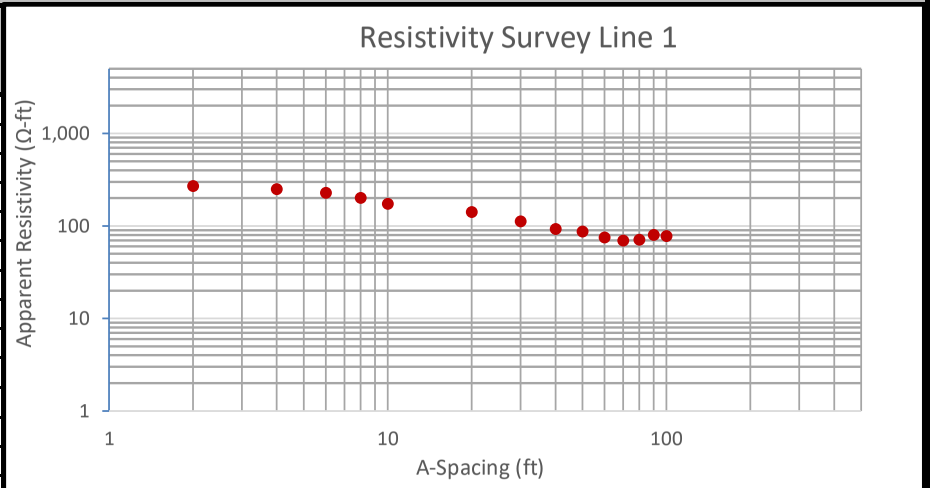
APPENDIX D – SOIL RESISTIVITY RESULTS

PROJECT NO.: J037566.01
CLIENT: Emerald Energy and Land Exploration Company
PROJECT: AMPT - Amherst #2 Substation
LOCATION: Amherst, Ohio

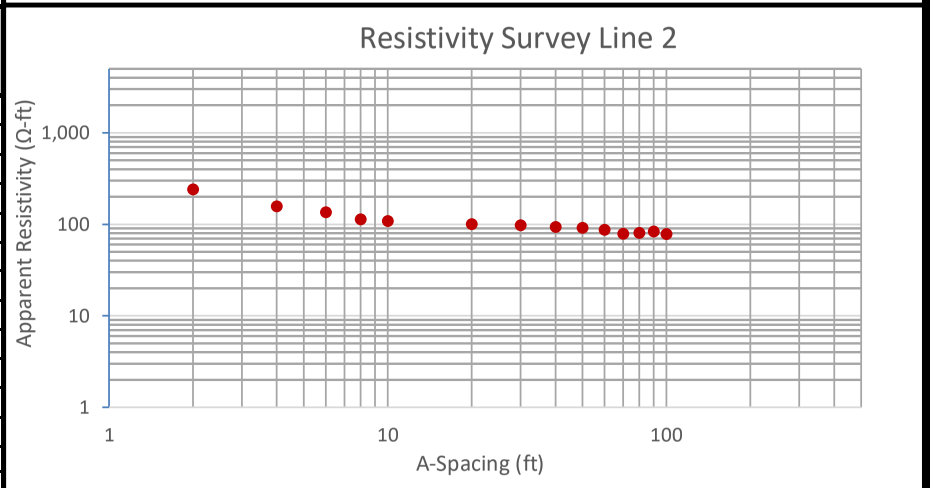
Geotechnology, LLC
Date Printed: 7/8/2021
Time Printed: 10:01 PM

Amherst #2 Substation Wenner Array - Resistivity Survey

Survey No. and Location	Orientation	"A" Spacing (ft)	Apparent Resistivity (Ω-ft)	Resistance (Ω)	Current (mA)
Resistivity Survey Line 1	East to West	2	268.9	21.4	49.8
		4	249.2	9.9	52.8
		6	227.0	6.0	48.9
		8	200.4	4.0	49.0
		10	173.2	2.8	49.0
		20	140.9	1.1	51.4
		30	111.4	0.6	51.6
		40	92.3	0.4	55.1
		50	86.8	0.3	50.2
		60	75.1	0.2	53.3
		70	69.2	0.2	53.4
		80	70.8	0.1	53.9
		90	79.7	0.1	52.5
		100	77.4	0.1	53.7



Survey No. and Location	Orientation	"A" Spacing (ft)	Apparent Resistivity (Ω-ft)	Resistance (Ω)	Current (mA)
Resistivity Survey Line 2	East to West	2	241.5	19.2	51.5
		4	157.5	6.3	51.2
		6	135.0	3.6	54.6
		8	113.4	2.3	54.5
		10	108.5	1.7	52.5
		20	100.6	0.8	54.2
		30	97.3	0.5	51.1
		40	93.3	0.4	54.8
		50	91.6	0.3	53.1
		60	86.9	0.2	54.7
		70	79.1	0.2	53.1
		80	80.4	0.2	61.2
		90	83.3	0.1	55.8
		100	78.4	0.1	53.0



APPENDIX E – LABORATORY TEST DATA

Tabulation of Laboratory Tests

Particle-Size Analysis Test Forms

Standard Proctor Test Form

Soil Unconfined Compressive Strength Test Forms

Rock Uniaxial Compressive Strength Test Forms

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AMPT - AMHERST # 2 SUBSTATION EXPANSION
AMHERST, OHIO
J037566.01

TABULATION OF LABORATORY TESTS

Boring No.	Sample No.	Depth (ft.) From	Depth (ft.) To	Moisture Content (%)	Dry Unit Weight (pcf)	Atterberg Limits (%) LL	PL	PI	Gradation Analysis (%) Gravel	Sand	Silt	Clay	USCS Classification	Unconfined Compressive Strength (psf)	Uniaxial Compressive Strength (psi)	Standard Proctor Maximum Dry Density (pcf)	Standard Proctor Optimum Moisture Content (%)
B-1	SS-1	0	1.5	9.5													
B-1	SS-2	1.5	3.0	17.2					0.3	71.8	27.9						
B-1	SS-3	3.0	4.5	0.7					1.4	49.8	48.8						
B-1	SS-4	4.5	6.0	21.5													
B-1	SS-5	6.0	7.5	20.9		36	22	14	2.8	27.9	29.7	39.6	CL				
B-1	SS-6	7.5	9.0	13.1													
B-1	SS-7	9.0	10.5	7.7													
B-1	SS-8	14.0	15.5	1.7													
B-1	SS-9	19.0	20.5	4.3													
B-1	RC-10	26.2	27.8	5.3	143.9										131		
B-2	SS-1	0.0	1.5	18.2													
B-2	SS-2	1.5	3.0	13.9					7.3	61.3	31.4						
B-2	SS-3B	4.0	4.5	17.4					4.3	25.4	70.3						
B-2	ST-4A	4.5	4.7	17.9		35	21	14	2.7	21.9	75.4		CL				
B-2	ST-4B	4.9	5.6	13.7	125.5									6,950			
B-2	SS-5	6.5	8.0	2.1													
B-2	SS-6	8.0	9.5	4.4													
B-2	RC-8	18.4	19.0	4.1	153.3										345		
B-3	SS-1	0.0	1.5	21.4													
B-3	BULK	0.2	5.0	20.8		29	19	10					CL			116.5	14.4
B-3	ST-2A	1.5	1.8	11.0		30	19	11	0.0	11.4	64.1	24.5	CL				
B-3	ST-2B	1.9	2.5	12.3	120.3									4,560			
B-3	SS-3	3.5	5.0	11.2													
B-3	SS-4	5.0	6.5	4.3													
B-3	SS-5	6.5	8.0	4.8													
B-3	SS-6	8.0	9.5	5.0													
B-3	RC-7	12.0	12.5	9.0	134.8										32		
B-3	RC-8	16.6	17.4	6.7	142.4										31		

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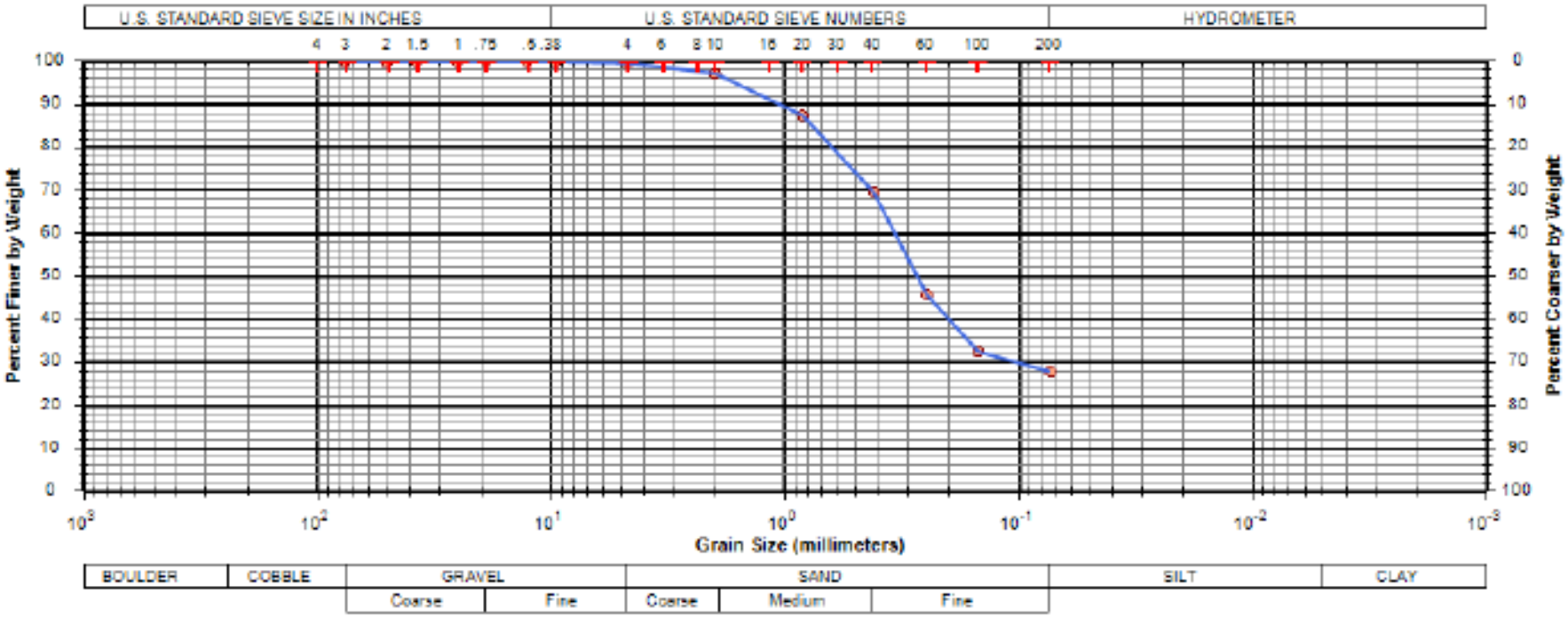
SIEVE ANALYSIS OF AGGREGATES ASTM C-136

Client:	Emerald Energy & Exploration Land Company							**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH							**Date:**	06/24/2021
Boring No.:	B-1	**Sample No.:**	SS-2	**Depth (ft.):**	1.5-3.0	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**	**USCS**
Sample Description:	Brown silty SAND (lacustrine).					0.3	71.8	27.9	-
						LL	**PL**	**PI**	**Group Index**	**WC (%)**



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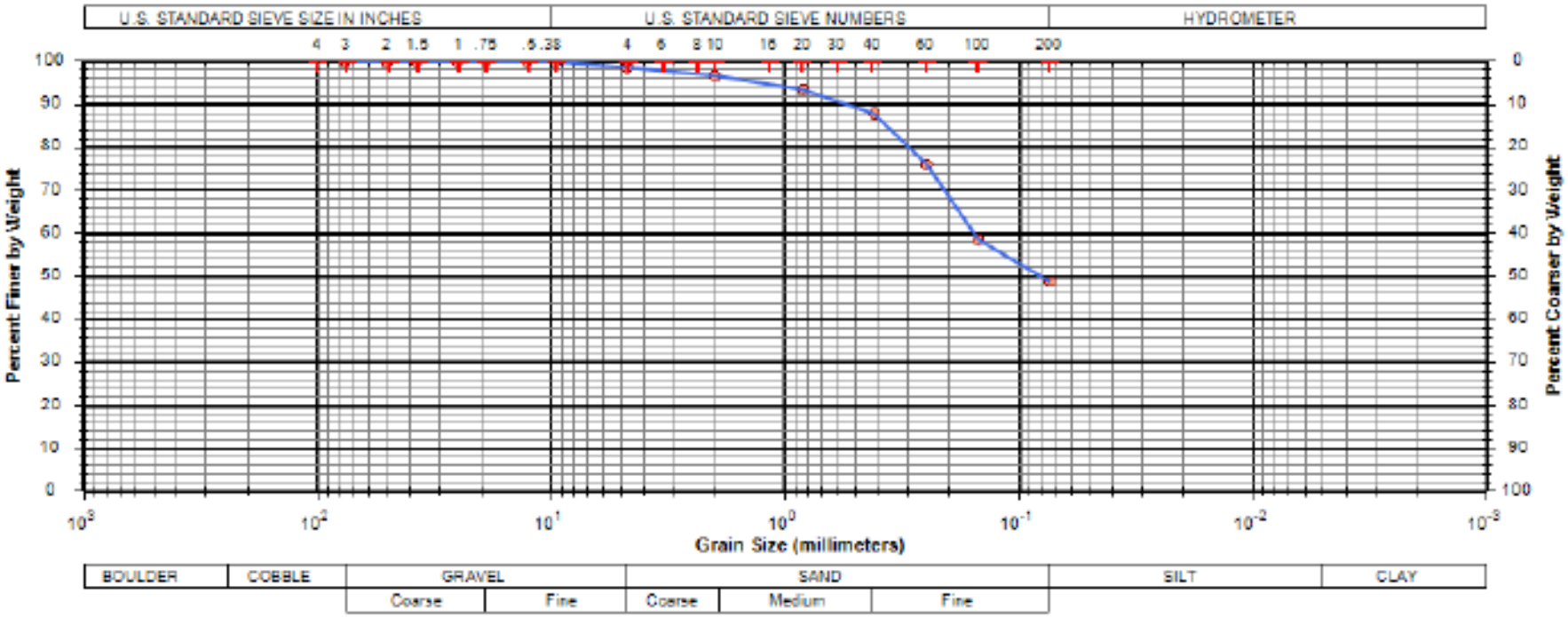
SIEVE ANALYSIS OF AGGREGATES ASTM C-136

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	06/24/2021
Boring No.:	B-1	**Sample No.:**	SS-3	**Depth (ft.):**	3.0-4.5	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**		**USCS**
Sample Description:	Brown and gray silty SAND (lacustrine).					1.4	49.8	48.8		-
						LL	**PL**	**PI**	**Group Index**	**WC (%)**



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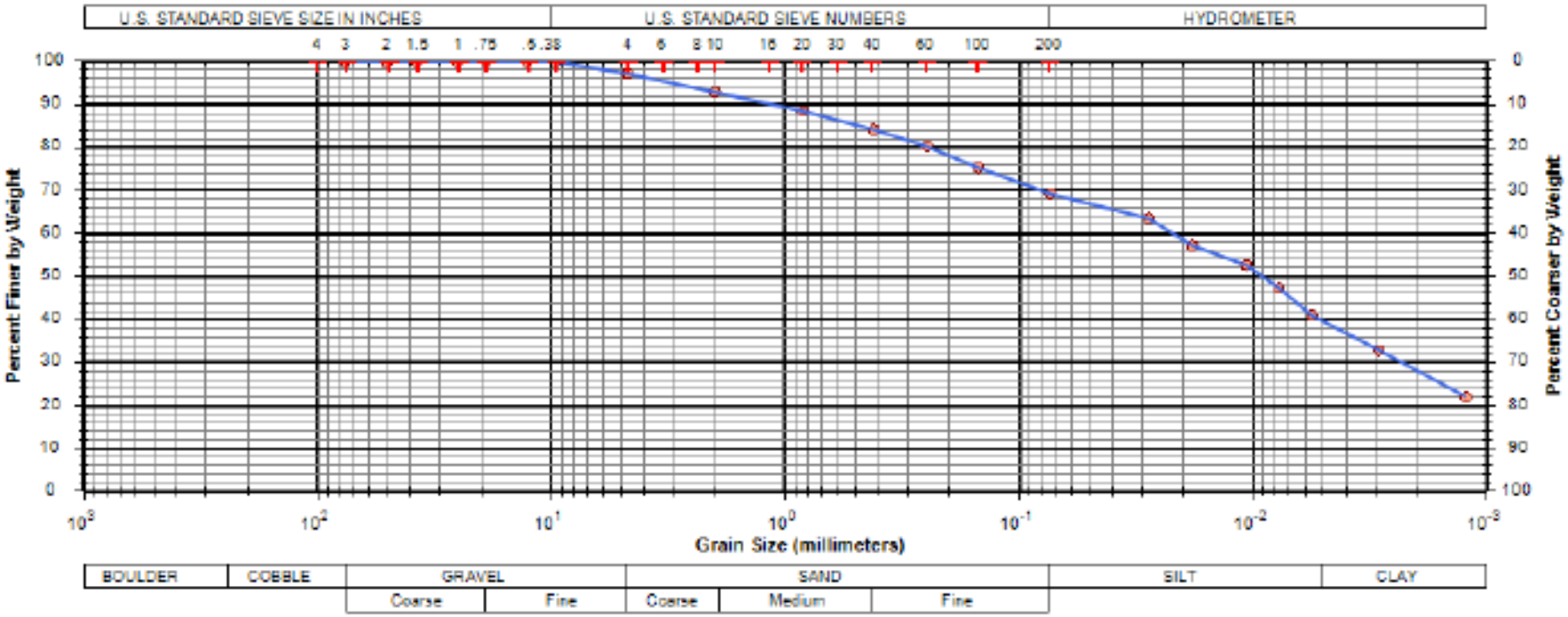
PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	06/24/2021
Boring No.:	B-1	**Sample No.:**	SS-5	**Depth (ft.):**	6.0-7.5	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Gray and brown and reddish brown LEAN CLAY with sand, trace gravel (glacial till).					2.8	27.9	29.7	39.6	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						36	22	14		



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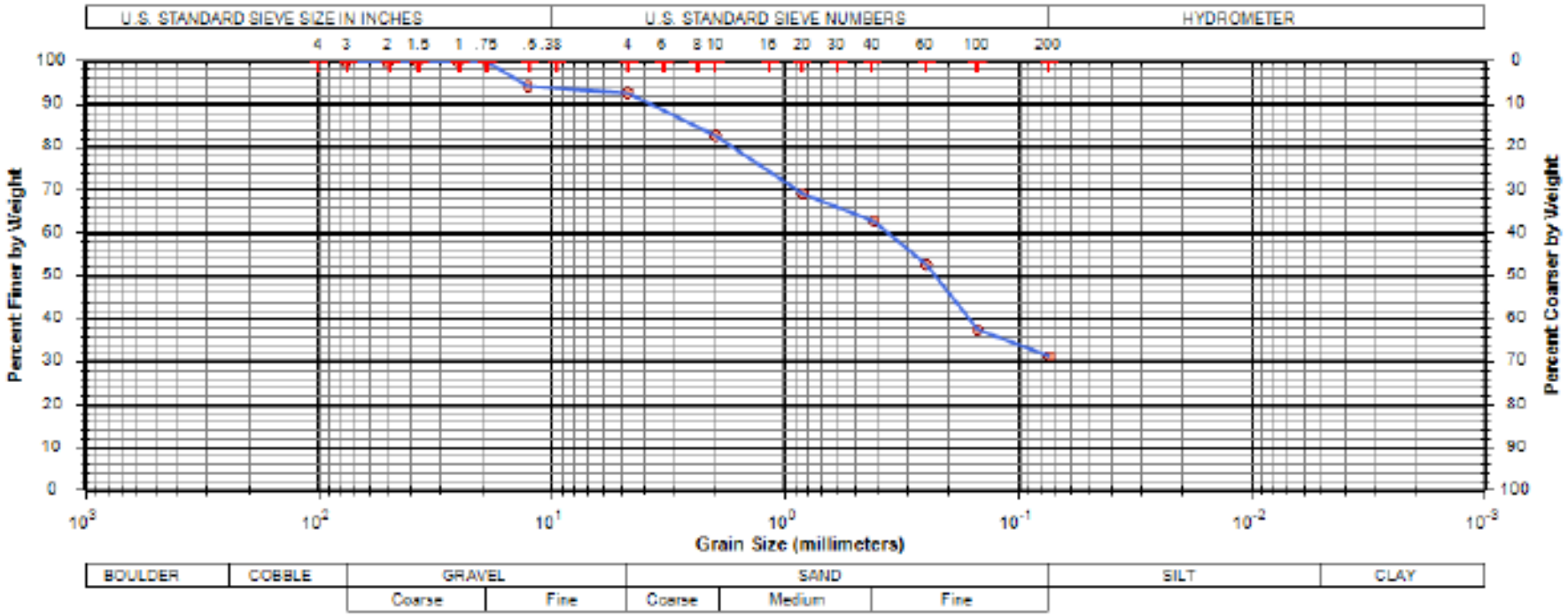
SIEVE ANALYSIS OF AGGREGATES ASTM C-136

Client:	Emerald Energy & Exploration Land Company							**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH							**Date:**	06/24/2021
Boring No.:	B-2	**Sample No.:**	SS-2	**Depth (ft.):**	1.5-3.0	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**	**USCS**
Sample Description:	Brown silty SAND (lacustrine).					7.3	61.3	31.4	-
						LL	**PL**	**PI**	**Group Index**	**WC (%)**



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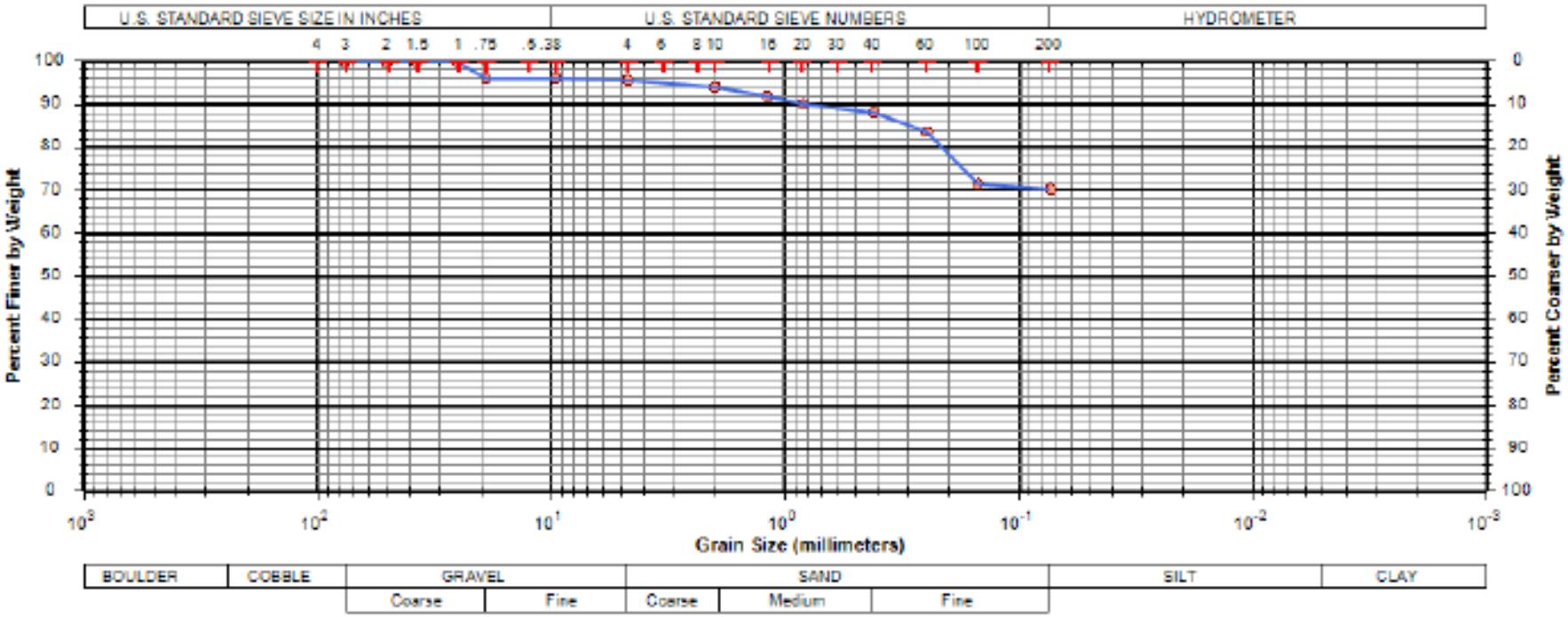
SIEVE ANALYSIS OF AGGREGATES ASTM C-136

Client:	Emerald Energy & Exploration Land Company							**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH							**Date:**	06/24/2021
Boring No.:	B-2	**Sample No.:**	3B	**Depth (ft.):**	4.0-4.5	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**	**USCS**
Sample Description:	Gray LEAN CLAY with sand, trace gravel (glacial till).					4.3	25.4	70.3	
						LL	**PL**	**PI** / **Group Index**	**WC (%)**



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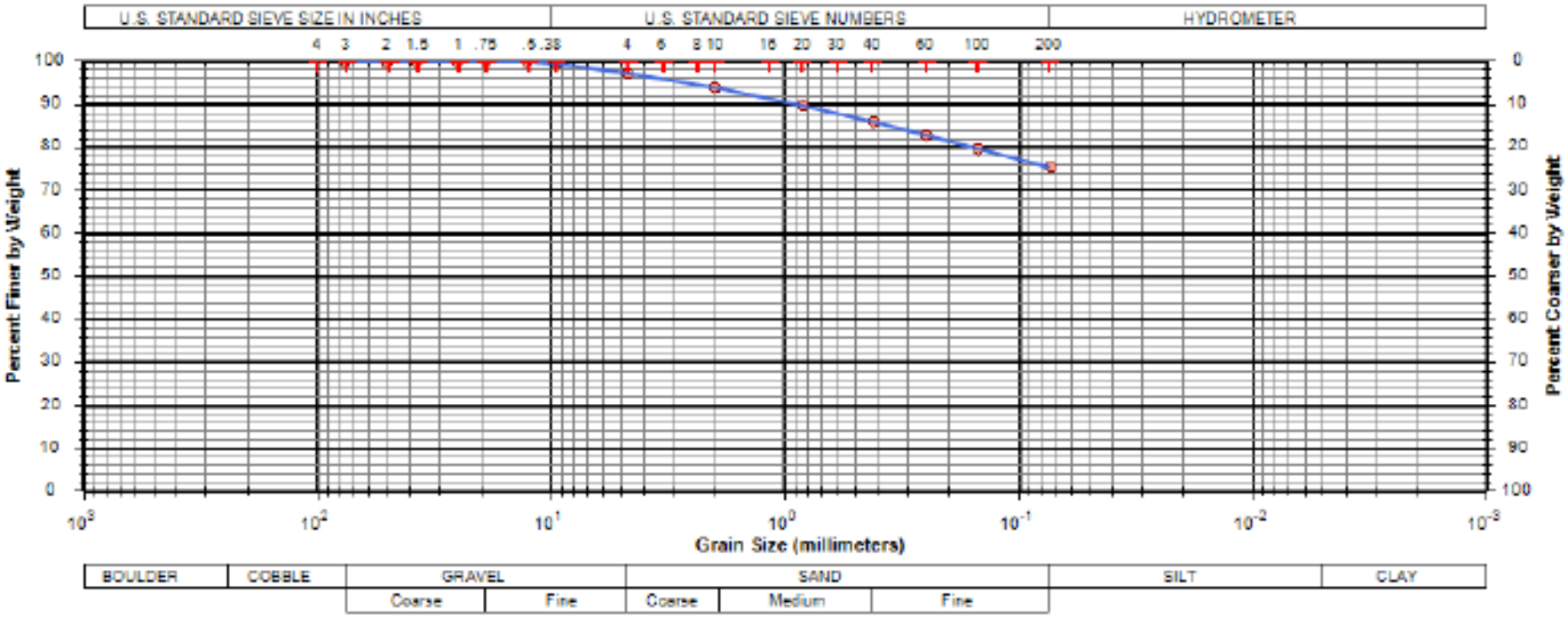
SIEVE ANALYSIS OF AGGREGATES ASTM C-136

Client:	Emerald Energy & Exploration Land Company							**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH							**Date:**	06/24/2021
Boring No.:	B-2	**Sample No.:**	ST-4A	**Depth (ft.):**	4.5-4.7	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**	**USCS**
Sample Description:	Gray LEAN CLAY with sand, trace gravel (glacial till).					2.7	21.9	75.4	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						35	21	14		



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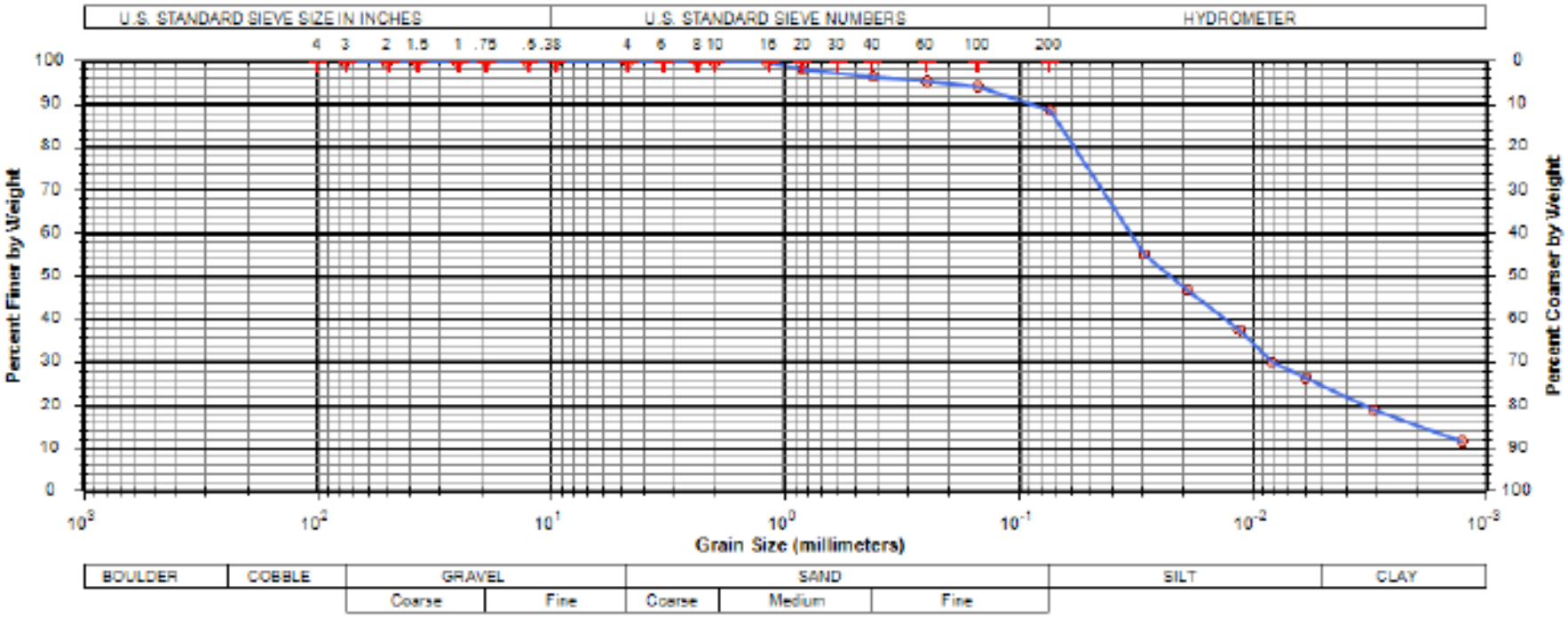
PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	Emerald Energy & Exploration Land Company								**Project No.:**	J037566.01
Project:	Geotechnical Service, AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH								**Date:**	06/24/2021
Boring No.:	B-3	**Sample No.:**	ST-2A	**Depth (ft.):**	1.5-1.8	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Grayish brown LEAN CLAY with sand, trace gravel (glacial till).					0.0	11.4	64.1	24.5	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						30	19	11		



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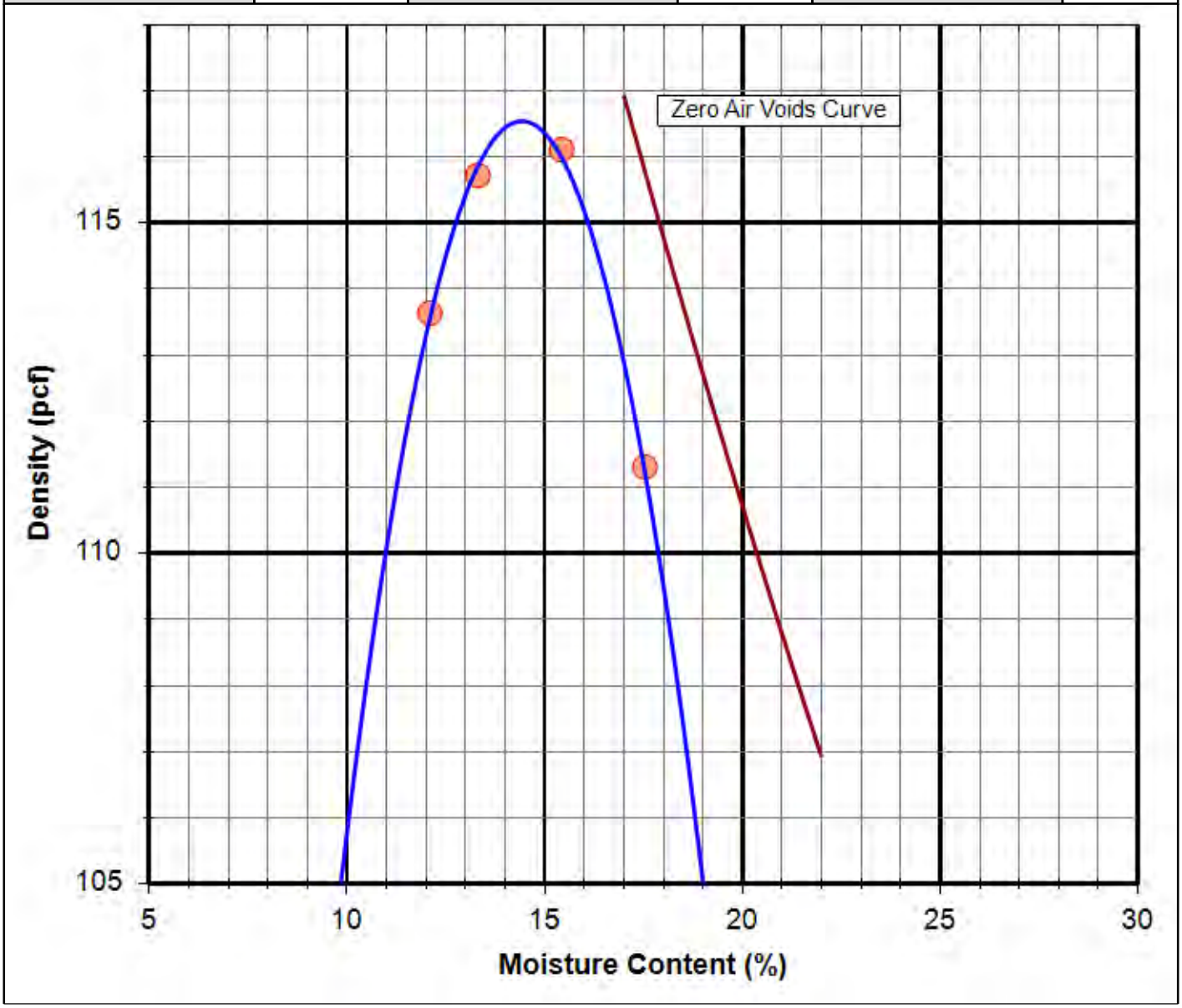
STANDARD PROCTOR MOISTURE DENSITY TEST, ASTM D698, METHOD A

Client:	Emerald Energy & Exploration Land Company	**Project No.:**	J037566.01
Project:	AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line, Amherst, OH	**Date:**	6/29/2021

Sample Obtained From:	B-3, Bulk			**Depth (ft.):**	0.2 - 5.0
Sample Description:	Gray, grayish brown, and brown LEAN CLAY with sand, trace gravel.	**LL**	**PL**	**PI**	**USCS**
		29	19	10	CL

Maximum Dry Density (pcf):	116.5	**Optimum Moisture Content:**	14.4%	**In Situ Moisture Content:**	20.8%



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UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS
ASTM D2166

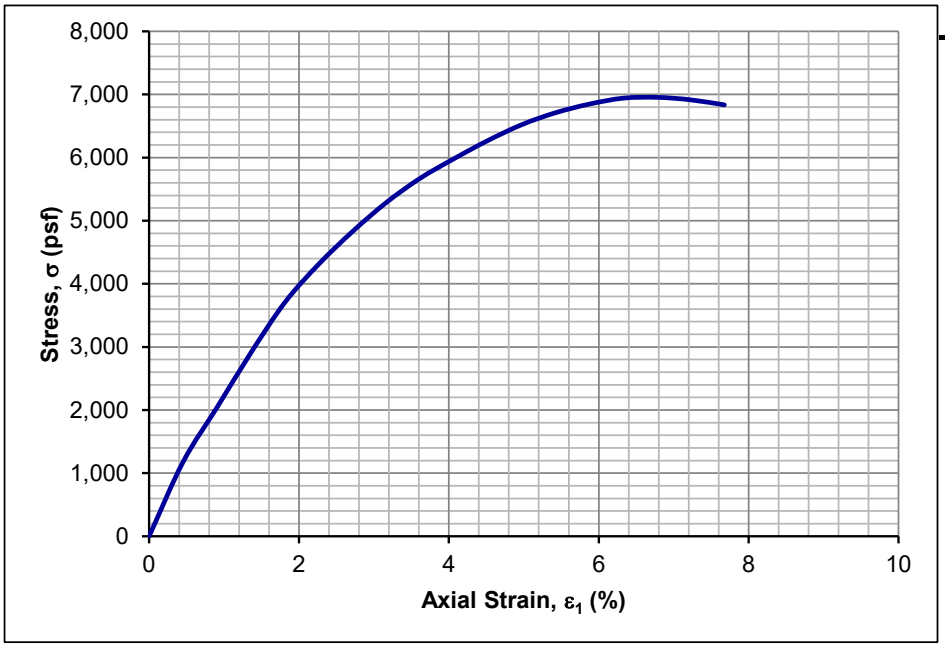
CLIENT : Emerald Energy & Exploration Land Company DATE: 6/17/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-2 SAMPLE NO.: ST-4B DEPTH (ft.): 4.9-5.6
SAMPLE OBTAINED BY: Shelby Tube CONDITION: Undisturbed
SAMPLE DESCRIPTION: Gray moist very stiff LEAN CLAY with sand, trace gravel (glacial till).

LIQUID LIMIT (%): 35 PLASTIC LIMIT (%): 21 PLASTICITY INDEX (%): 14 USCS: CL
GRAVEL (%): 2.7 SAND (%): 21.9 SILT & CLAY (%): 75.4
SPECIFIC GRAVITY OF SOLIDS: 2.75 (Assumed) LOAD CELL NO.: 1059

SAMPLE DATA	
DIAMETER (in.):	2.83
HEIGHT (in.):	5.54
HEIGHT TO DIAMETER RATIO:	1.95
WET UNIT WEIGHT (pcf):	142.6
DRY UNIT WEIGHT (pcf):	125.5
VOID RATIO:	0.37
MOISTURE CONTENT (%)*:	13.7
DEGREE OF SATURATION (%):	100

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.1**
AXIAL STRAIN AT FAILURE (%):	**6.8**
TIME TO FAILURE (min.):	**7.3**
UNCONFINED COMPRESSIVE STRENGTH, q_u (psf):	**6,950**
UNDRAINED SHEAR STRENGTH, s_u (psf):	**3,475**
SENSITIVITY, S_t:	**-**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

*Moisture content determined after shear from entire sample.

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UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS
ASTM D2166

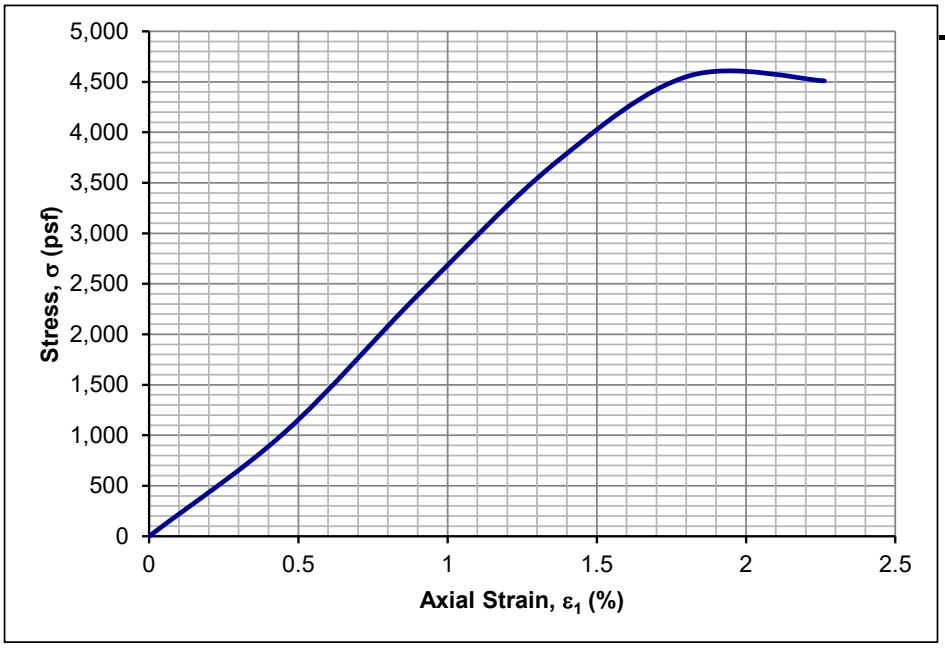
CLIENT : Emerald Energy & Exploration Land Company DATE: 6/17/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-3 SAMPLE NO.: ST-2B DEPTH (ft.): 1.9-2.5
SAMPLE OBTAINED BY: Shelby Tube CONDITION: Undisturbed
SAMPLE DESCRIPTION: Grayish brown moist very stiff LEAN CLAY with sand, trace gravel (glacial till).

LIQUID LIMIT (%): 30 PLASTIC LIMIT (%): 19 PLASTICITY INDEX (%): 11 USCS: CL
GRAVEL (%): 0.0 SAND (%): 11.4 SILT (%): 64.1 CLAY (%): 24.5
SPECIFIC GRAVITY OF SOLIDS: 2.75 (Assumed) LOAD CELL NO.: 1059

SAMPLE DATA	
DIAMETER (in.):	2.80
HEIGHT (in.):	5.53
HEIGHT TO DIAMETER RATIO:	1.98
WET UNIT WEIGHT (pcf):	135.0
DRY UNIT WEIGHT (pcf):	120.3
VOID RATIO:	0.43
MOISTURE CONTENT (%)*:	12.3
DEGREE OF SATURATION (%):	79

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.1**
AXIAL STRAIN AT FAILURE (%):	**1.8**
TIME TO FAILURE (min.):	**1.9**
UNCONFINED COMPRESSIVE STRENGTH, q_u (psf):	**4,560**
UNDRAINED SHEAR STRENGTH, s_u (psf):	**2,280**
SENSITIVITY, S_t:	**-**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

*Moisture content determined after shear from entire sample.

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UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

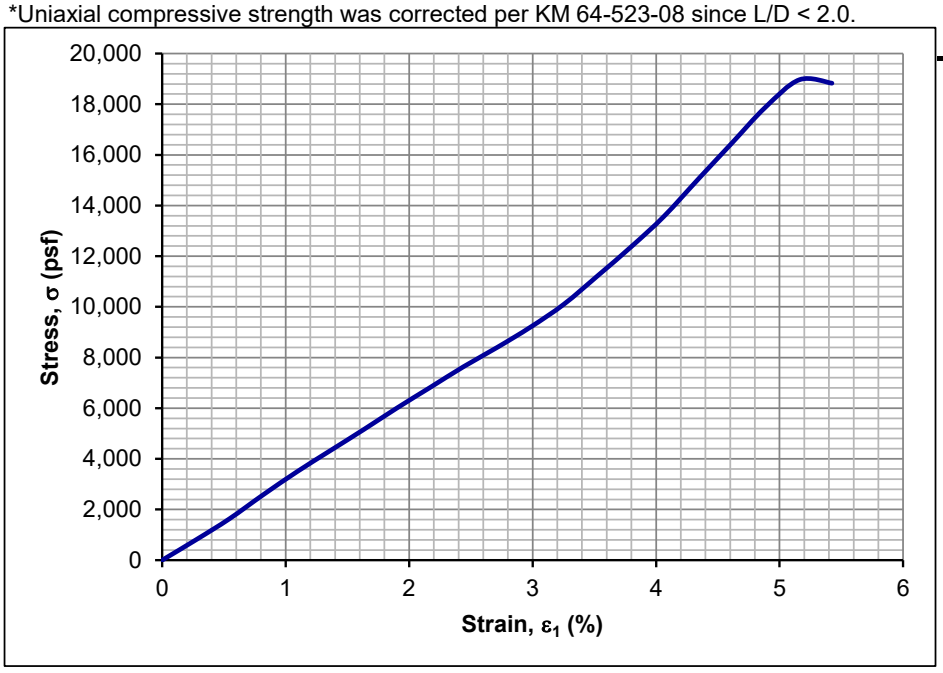
CLIENT : Emerald Energy & Exploration Land Company DATE: 6/17/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-1 SAMPLE NO.: RC-10 DEPTH (ft.): 26.2-27.8
SAMPLE DESCRIPTION: Interbedded gray extremely weak SILTSTONE and SHALE thinly laminated, medium bedded, fissile.
BEDROCK FORMATION: Berea Sandstone and Bedford Shale, Undivided
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: Forney QC-200-08

SAMPLE DATA	
DIAMETER (in.):	1.89
HEIGHT (in.):	3.69
HEIGHT TO DIAMETER RATIO*:	1.9
WET UNIT WEIGHT (pcf):	151.6
DRY UNIT WEIGHT (pcf):	143.9
MOISTURE CONTENT (%):	5.3

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.6**
TIME TO FAILURE (min.):	**3.3**
AXIAL STRAIN AT FAILURE (%):	**5.2**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**18.9**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**131.0**

*Uniaxial compressive strength was corrected per KM 64-523-08 since L/D < 2.0.



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

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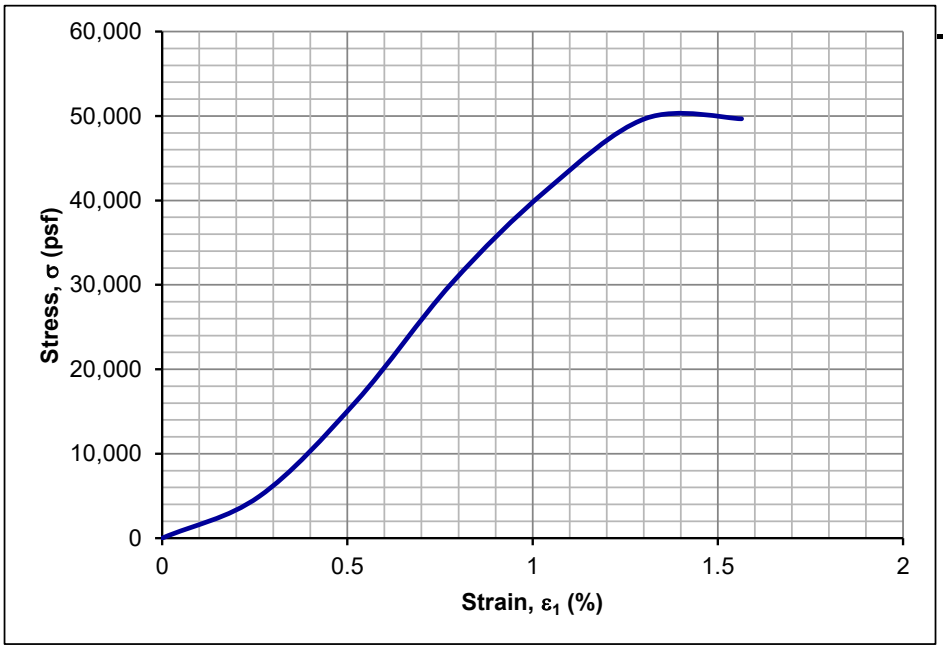
UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

CLIENT : Emerald Energy & Exploration Land Company DATE: 6/17/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-2 SAMPLE NO.: RC-8 DEPTH (ft.): 18.4-19.0
SAMPLE DESCRIPTION: Gray slightly moist very weak SILTSTONE.
BEDROCK FORMATION: Berea Sandstone and Bedford Shale, Undivided
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: Forney QC-200-08

SAMPLE DATA	
DIAMETER (in.):	1.86
HEIGHT (in.):	3.86
HEIGHT TO DIAMETER RATIO:	2.1
WET UNIT WEIGHT (pcf):	159.6
DRY UNIT WEIGHT (pcf):	153.3
MOISTURE CONTENT (%):	4.1

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.4**
TIME TO FAILURE (min.):	**0.9**
AXIAL STRAIN AT FAILURE (%):	**1.3**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**49.7**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**345.0**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

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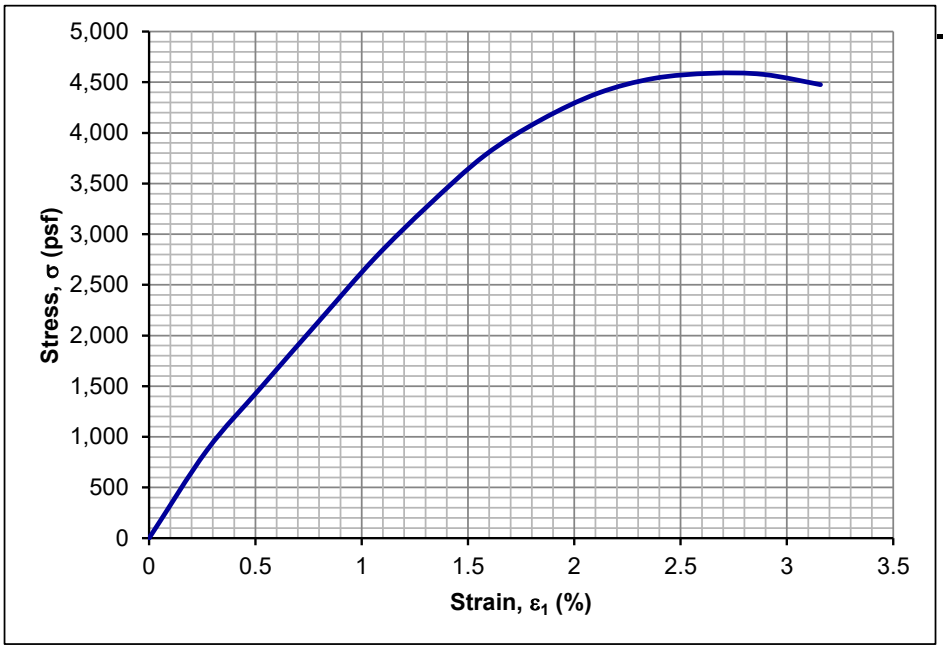
UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

CLIENT : Emerald Energy & Exploration Land Company DATE: 6/17/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-3 SAMPLE NO.: RC-7 DEPTH (ft.): 12.0-12.5
SAMPLE DESCRIPTION: Reddish brown moist extremely weak weathered SHALE.
BEDROCK FORMATION: Berea Sandstone and Bedford Shale, Undivided
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: Forney QC-200-08

SAMPLE DATA	
DIAMETER (in.):	1.81
HEIGHT (in.):	3.80
HEIGHT TO DIAMETER RATIO:	2.1
WET UNIT WEIGHT (pcf):	147.0
DRY UNIT WEIGHT (pcf):	134.8
MOISTURE CONTENT (%):	9.0

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.6**
TIME TO FAILURE (min.):	**1.7**
AXIAL STRAIN AT FAILURE (%):	**2.6**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**4.6**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**31.9**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

GEOTECHNOLOGY
A Universal Engineering Sciences Company

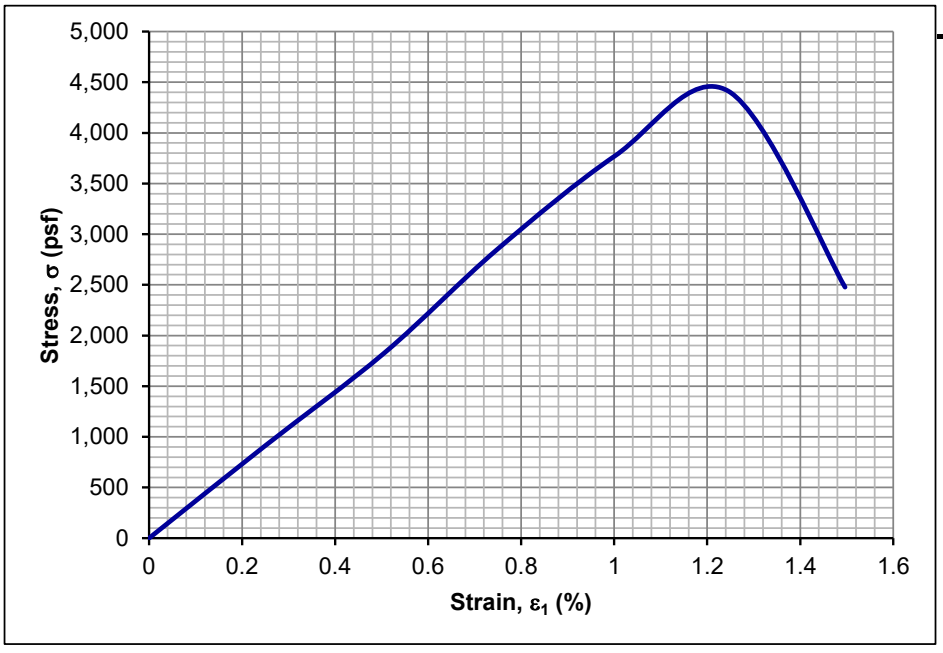
UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

CLIENT : Emerald Energy & Exploration Land Company DATE: 6/17/2021
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion & 138kV Transmission Line
LOCATION: Amherst, OH

BORING NO.: B-3 SAMPLE NO.: RC-8 DEPTH (ft.): 16.6-17.4
SAMPLE DESCRIPTION: Reddish brown moist extremely weak weathered SHALE.
BEDROCK FORMATION: Berea Sandstone and Bedford Shale, Undivided
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: Forney QC-200-08

SAMPLE DATA	
DIAMETER (in.):	1.85
HEIGHT (in.):	4.02
HEIGHT TO DIAMETER RATIO:	2.2
WET UNIT WEIGHT (pcf):	151.9
DRY UNIT WEIGHT (pcf):	142.4
MOISTURE CONTENT (%):	6.7

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.4**
TIME TO FAILURE (min.):	**0.9**
AXIAL STRAIN AT FAILURE (%):	**1.2**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**4.4**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**30.6**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

APPENDIX F – IDEALIZED SOIL & BEDROCK PROFILES

GEOTECHNOLOGY
A Universal Engineering Sciences Company

CLIENT: Emerald Energy & Exploration Land Company
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion
PROJECT LOCATION: Amherst, Ohio

IDEALIZED SOIL & BEDROCK PROFILE
PARAMETERS FOR AXIAL/LATERAL LOAD ANALYSES
FOR STRUCTURES WITHIN FILLED-IN DETENTION BASIN

El. (ft.)	Depth (ft.)	
688.0	0.0	Ground Surface
673.0	15.0	New Controlled Fill: (stiff clay model): *Lateral Parameters for LPILE/MFAD* γ = 130 pcf; γ' = 72.6 pcf c = 2,000 psf; ε_{50} = 0.006 E_p = 1,300 psi *Axial Parameters* $q_{s,all}$ = 400 psf; $q_{p,all}$ = 6,000 psf
668.0	20.0	Stiff to Very Stiff Glacial Till/Residuum (stiff clay model): *Lateral Parameters for LPILE/MFAD* γ = 130 pcf; γ' = 72.6 pcf c = 3,000 psf; ε_{50} = 0.005 E_p = 1,800 psi *Axial Parameters* $q_{s,all}$ = 600 psf; $q_{p,all}$ = 9,000 psf
850	18.0	Shale and Siltstone Bedrock: *Lateral Parameters for LPILE (use stiff clay model):* $\gamma = \gamma'$ = 140 pcf c = 4,300 psf; ε_{50} = 0.003 *Lateral Parameters for MFAD* $\gamma = \gamma'$ = 140 pcf; q_u = 60 psi RQD = 45% RMR = 28; E_{RM} = 410 psi c_{RM} = 17 psi; ϕ_{RM} = 32° τ_{ult} = 10 psi *Axial Parameters* $q_{s,all}$ = 480 psf; $q_{p,all}$ = 10,000 psf (12-inch min. bedrock embedment)

Symbol Definition:

γ = Unit weight
γ' = Effective unit weight
c = Cohesion
ε_{50} = Strain at 50% of unconfined compressive strength
E_p = Deformation modulus
$q_{s,all}$ = Allowable side resistance
$q_{p,all}$ = Allowable end/tip resistance
q_u = Uniaxial compressive strength
RQD = Rock quality designation
RMR = Rock mass rating
E_{RM} = Rock mass modulus
c_{RM} = Rock mass cohesion
ϕ_{RM} = Rock mass friction angle
τ_{ult} = Nominal rock-concrete bond strength

Notes:

- Axial side resistance should be ignored in the upper 5 feet of the profile.
- Laterally loaded deep foundations should be designed using the p-y approach using the above-provided parameters.
- Lateral resistance should be ignored in the upper 3.5 feet of the profile due to frost.
- Appropriate reduction factors (p-multipliers) should be included in the analyses that account for pile width/diameter and pile spacing.
- Assume static groundwater table is at the bedrock surface.
- Submerged (effective) unit weights should be used below the groundwater table to account for effective stresses in the analyses.

GEOTECHNOLOGY
A Universal Engineering Sciences Company

CLIENT: Emerald Energy & Exploration Land Company
PROJECT NO.: J037566.01
PROJECT: AMPT - Amherst #2 Substation Expansion
PROJECT LOCATION: Amherst, Ohio

IDEALIZED SOIL & BEDROCK PROFILE
PARAMETERS FOR AXIAL/LATERAL LOAD ANALYSES
FOR STRUCTURES OUTSIDE OF FILLED DETENTION BASIN

El. (ft.)	Depth (ft.)	
688.0	0.0	Ground Surface
682.0	6.0	Loose cohesionless soils (Reese sand model): *Lateral Parameters* γ = 105 pcf $\quad$ γ' = 47.6 pcf ϕ = 30° k = 20 pci for submerged conditions and 25 pci above groundwater table E_p = 500 psi
675.0	13.0	Stiff to Very Stiff Glacial Till/Residuum (stiff clay model): *Lateral Parameters for LPILE/MFAD* γ = 130 pcf $\quad$ γ' = 72.6 pcf c = 3,000 psf $\quad$ ε_{50} = 0.005 E_p = 1.8 ksi *Axial Parameters* $q_{s,all}$ = 600 psf $\quad$ $q_{p,all}$ = 9,000 psf
850	18.0	Shale and Siltstone Bedrock: *Lateral Parameters for LPILE (use stiff clay model):* $\gamma = \gamma'$ = 140 pcf c = 4,300 psf $\quad$ ε_{50} = 0.003 *Lateral Parameters for MFAD* $\gamma = \gamma'$ = 140 pcf $\quad$ q_u = 60 psi RQD = 45% RMR = 28 $\quad$ E_{RM} = 410 psi c_{RM} = 17 psi $\quad$ ϕ_{RM} = 32° τ_{ult} = 10 psi *Axial Parameters* $q_{s,all}$ = 480 psf $\quad$ $q_{p,all}$ = 10,000 psf (12-inch min. bedrock embedment)

Symbol Definition:

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γ' = Effective unit weight
c = Cohesion
ε_{50} = Strain at 50% of unconfined compressive strength
E_p = Deformation modulus
$q_{s,all}$ = Allowable side resistance
$q_{p,all}$ = Allowable end/tip resistance
q_u = Uniaxial compressive strength
RQD = Rock quality designation
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c_{RM} = Rock mass cohesion
ϕ_{RM} = Rock mass friction angle
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Notes:

- Axial side resistance should be ignored in the upper 5 feet of the profile.
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- Lateral resistance should be ignored in the upper 3.5 feet of the profile due to frost.
- Appropriate reduction factors (p-multipliers) should be included in the analyses that account for pile width/diameter and pile spacing.
- Assume static groundwater table is at the bedrock surface.
- Submerged (effective) unit weights should be used below the groundwater table to account for effective stresses in the analyses.

APPENDIX I NOISE SURVEY ANALYSIS

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March 18, 2022

AMP TRANSMISSION, LLC

Amherst #2 Substation Expansion and 138 kV Transmission Line Project

Noise Survey Analysis

Revision B

PROJECT NUMBER:
167911

PROJECT CONTACT:
TYLER KENT, P.E.
EMAIL:
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(315) 295-7407

NOISE ANALYSIS REPORT

PREPARED FOR:

AMP TRANSMISSION, LLC

PREPARED BY:

TYLER KENT P.E. – (315) 295-7407 – TYLER.KENT@POWERENG.COM

REVISION HISTORY						
REV.	ISSUE DATE	ISSUED FOR	PREP BY	CHKD BY	APPD BY	NOTES
A	2021-06-18	Appvl	TRK	DG	ADW	Issued for review and approval
B	2022-03-18	Impl	TRK	DG	ADW	Issued for Implementation

"Issued For" Definitions:

- "Prelim" means this document is issued for preliminary review, not for implementation
- "Appvl" means this document is issued for review and approval, not for implementation
- "Impl" means this document is issued for implementation
- "Record" means this document is issued after project completion for project file

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1.0 EXECUTIVE SUMMARY

AMP Transmission, LLC (AMPT) requested that POWER Engineers, Inc. (POWER) analyze the noise from the proposed Amherst #2 Substation Expansion and 138 kV Transmission Line Project (Project) within the City of Amherst, Amherst Township, Ohio to ensure the installation and operation complies with the township noise resolution. The substation expansion will install a single 138/69/12 kilovolt (kV) autotransformer that will combine with the two existing 67/12.47/7.2 kilovolt (kV) to be the primary continuous noise producing equipment for the Project.

POWER's engineering service for this study was to measure the existing ambient noise levels and predict noise levels at the future site. Measurements were taken along an external perimeter of the site, and within the substation at the existing transformers. Modeling was used to calculate the contribution from the existing transformers and the new transformer to predict the total sound levels at the property line.

Based upon the predicted noise levels during continuous operation of the new transformer, POWER does not expect the use of noise mitigation techniques will be necessary to meet the local compliance criteria for the substation. While the Amherst #2 Substation is exempt from the township of Amherst's noise resolution, as it is a public utility, audible noise analysis was completed to develop an expectation of predicted noise. The maximum predicted noise produced from the new transformer, at the edge of the property line, is 59.0 A-weighted decibels [dB(A)]. For adjacent residential properties the maximum predicted noise produced from the new transformer at the edge of the property line is 53.7 A-weighted decibels [dB(A)]. This value is below 55 dB(A), an industry typical limit for residential areas and is considered as "plainly audible" as described in the township resolution.

2.0 OVERVIEW / NOISE DISCUSSION

Noise is defined as unwanted sound. It may be continuous (constant noise and decibel level), steady (constant noise with a fluctuating decibel level), impulsive (having a peak of short duration), stationary (occurring from a fixed source), intermittent (occurring at the same rate), or transient (occurring at a different rate). Noise levels are quantified using units of decibels. The A-weighted scale, reported in A-weighted decibels [dB(A)], most effectively approximates the human ear's response to sounds.

Audible noise (AN) from a transformer originates principally in the transformer core and transmits through the outer shell where it radiates as airborne noise. This emitted noise is focused mostly horizontally due to the configuration of the internal core and coils, with majority of the sound located roughly at 1/3 of the height of the transformer.

Concern about noise is related to negative impacts on humans and animals. Human response to noise is commonly expressed as an annoyance and the level of annoyance may be affected by the intensity

of the noise, its frequency (pitch), its duration of exposure and/or its recurrence. Ambient noise is the total noise in an environment and usually comprises sounds from many sources. Typical ranges of audible sound levels for some common sources of noise are presented in Table 1.

TABLE 1: TYPICAL RANGE OF AUDIBLE NOISE FROM VARIOUS SOURCES

SOURCE	MEASURED SOUND LEVEL
Loud Automobile Horn	110 to 120 dB(A)
Heavy Truck and City Traffic	80 to 100 dB(A)
Freeway traffic	70 to 80 dB(A)
Conversational Speech	60 to 70 dB(A)
Typical Business Office	50 to 60 dB(A)
Living Room, Suburban Area	40 to 50 dB(A)
Library	30 to 40 dB(A)
Broadcasting Studio	20 to 30 dB(A)

Source: U.S. EPA. 1981. Noise and its Measurements - Sound Levels and Human Response

Measuring the background ambient noise in a given area can help identify the likelihood of complaints. If an area has a background noise level that would already be considered noisy, the addition of a new noise source would not be expected to add any additional complaints. The audible noise from substation noise sources, specifically transformers are composed of two components:

- A broad band (random) component characterized as having high frequency content (different from more common environmental noises).
- Pure tone (hum) components, most noticeably second and fourth harmonics of the power frequency are superimposed on the broad band noise.

Changes in audible noise levels are typically described in statistical terms. For example, the L_{90} sound level is the noise level exceeded 90 percent of the time. This value is used to establish the ambient conditions as the additional 10 percent is typically noise associated with external instances such as traffic or other non-continuous noise sources. It is also common to evaluate sound levels over time.

Audible noise which is generated by a substation decreases with distance from the substation. Each transformer is considered a separate noise source. Overall, the attenuation of noise from the substation is approximately 3-6 dB per doubling of the distance from a location.

An individual's perception of a sound pressure level has been documented to estimate an individual's reaction to a change in noise. The Table 2 provides a means for criteria for predicting this reaction.

TABLE 2: PERCEPTION OF SOUND LEVEL CHANGE	
Change dB(A)	**Human Perception of Sound**
2-3	Barely perceptible
5	Readily noticeable
10	Doubling or "halving" of the loudness of sound
20	"Dramatic Change"
40	Difference between a faintly audible sound and a very loud sound

Source: Bolt, Beranek and Newman, Inc., Fundamentals and Abatement of Highway Traffic Noise, Report No, PB-222-703, June 1973

2.1 Compliance Limits

Compliance limits are based upon the governing authority. While most states invoke a noise regulation it can be superseded in a more restrictive nature by the local authority, or it may be adopted. This discussion identifies the controlling noise regulations that are applicable to the specific site and are considered in the analysis.

2.1.1 State Noise Criteria

The State of Ohio does not set specific noise regulations for non-government-controlled land.

2.1.2 Site Specific Noise Criteria [1]

The Township of Amherst Resolution 4-Noise Control Resolution No. 5/12/03 is a resolution which addresses noise control for the township. The Board of Trustees of Amherst Township declares resolutions for noise violations for use and construction. However, the board also provides exemptions to the regulations for utilities in section V.D.3. which states:

> *V. Exemptions*
>
> D. The following are also exempt from regulation and order under this resolution.
>
> 3.) Public Utilities and refuse companies and their employees acting in discharge of their duties.

The Amherst #2 Substation is exempt from the resolution as it is a public utility, and therefore has no limits on audible noise at the edge of the property line for continual use. However, this analysis does review the properties located directly west as they are zoned residential to determine in good faith if "plainly audible" noise will be likely to cause annoyance. A residential limit of 55 dB(A), a typical residential limit was used to account for "plainly audible" noises at the closest residential property.

2.2 Construction Noise

Amherst Township does not allow construction or maintenance during nighttime hours. Construction of the substation will be limited to daytime hours Monday through Saturday between 7:00 am to

[1] https://amhersttownship.us/resolutions

10:00 pm, as allowed by the Township ordinance. Therefore, no noise violations are anticipated during the construction phase of this Project.

2.2.1 Substation Tie Line Construction

Table 3 identifies the type of equipment to be used for each tie line activity during the construction sequence and provides a range of typical sound levels from the equipment. The typical sound levels were calculated at a distance of 50 feet from the source. To show the impact on the nearest residential building these reported values have been extrapolated for noise levels at the approximate distance to provide a conservative estimate at the residences.

Noise is assumed to be generated by several pieces of equipment at various locations within the right-of-way (ROW), as appropriate for each phase of construction. As shown in Table 3, the noise impacts from construction activities depends on the construction equipment used for each phase and the specific activity. These levels range from 80 dB(A) to 98 dB(A) at a distance of 50 feet from the construction activity. The closest residence to the tie line construction is approximately 1500 feet away as identified with a red box shown in Figure 1. At a distance of 1,500 feet the typical sound levels of construction noise experienced at any given residence will be sporadic and of limited duration and are anticipated to be perceivable as heavy city traffic to residential areas as referenced in Table 1.

Figure 1: Closest Residential Property

TABLE 3: TIE LINE TYPICAL CONSTRUCTION SOUND LEVELS			
Description of Activity	**Types of Equipment**	**Typical Sound Levels at 50 Feet (dB(A))**	**Estimated Sound Levels (dB(A)) at Closest Residence along Transmission Line Project**
Vegetation Removal and ROW Mowing	• Grapple trucks • Bulldozers • Track-mounted mowers • Motorized tree shears • Log forwarders • Chippers • Chain saws • Box trailers	84 to 98	75 to 89
Erosion/Sediment Controls and Access Road Improvements and Maintenance	• Dump trucks • Bulldozers, excavators, backhoes • Graders • Forwarders • 10-wheel trucks with grapples • Cranes	80 to 93	71 to 84
Removal and Disposal of Existing	• Cranes • Flatbed trucks • Pullers with take-up reel	80 to 90	71 to 81

TABLE 3: TIE LINE TYPICAL CONSTRUCTION SOUND LEVELS			
Description of Activity	**Types of Equipment**	**Typical Sound Levels at 50 Feet (dB(A))**	**Estimated Sound Levels (dB(A)) at Closest Residence along Transmission Line Project**
Transmission Line Components	• Excavators		
Installation of Foundations and Structures	• Backhoes and excavators • Rock drills mounted on excavators • Cluster drills with truck mounted compressors • Concrete trucks • Cranes • Aerial lift equipment • Tractor trailers	80 to 90	71 to 81
Conductor and Shield Wire Installation	• Puller-tensioners • Conductor reel stands • Cranes • Bucket trucks • Flatbed trucks	80 to 93	71 to 84
Restoration of the ROW	• Bulldozers • Excavators • Tractor-mounted York rakes • Straw blowers • Hydro-seeders	80 to 90	71 to 81

Source: U.S. Department of Transportation Federal Highway. Construction Equipment Noise Levels and Ranges, Construction Noise Handbook, August 2006.

2.2.2 Amherst #2 Substation Expansion Construction

Table 4 identifies the types of equipment to be used for the substation activity during the construction sequence and provides a range of typical sound levels from the equipment. The Amherst #2 Substation is surrounded by industrial and a residential area with the nearest residential home located approximately 220 feet away from the substation property line as identified with an orange line outlining the house and blue line for the station's property line as shown in Figure 1. Construction generated noise during the daytime area is anticipated to increase the existing ambient noise [60 dB(A)] in the vicinity of the substation as shown in Table 4. This increase to the sound levels experienced at any given residence will be sporadic and of limited duration but will be perceived as doubling of the ambient noise as shown in Table 2 with an increase of over 10 dB(A).

TABLE 4: SUBSTATION TYPICAL CONSTRUCTION SOUND LEVELS			
Description of Activity	**Types of Equipment**	**Typical Sound Levels at 50 Feet (dB(A))**	**Estimated Sound Levels (dB(A)) at Closest Residence to Amherst #2 Substation**
Installation of Foundations and Structures	• Backhoes and excavators • Rock drills mounted on excavators • Cluster drills with truck mounted compressors • Concrete trucks • Cranes • Aerial lift equipment • Tractor trailers	80 to 90	69 to 79

Source: U.S. Department of Transportation Federal Highway. Construction Equipment Noise Levels and Ranges, Construction Noise Handbook, August 2006.

3.0 EXISTING NOISE LEVELS

POWER performed measurements to document the existing ambient conditions at and surrounding the proposed site, pre-construction. These ambient conditions were used for comparison with the predicted noise expected from the operation of the expanded substation.

3.1 Test Procedures

Ambient noise measurements were preformed using the Larson Davis SoundTrack 831 sound level meters. The standard windscreen recommended and provided by the manufacturer was placed over the microphone to minimize the effect of wind during the measurements. The sound level meter was calibrated using the provided Larson Davis CAL200 Precision Acoustic Calibrator before and after the measurements at each test site at 114 dB(A), and the device reported error level was recorded. If the reported error was greater than one decibel after the measurements, the measurements were declared invalid and were re-measured.

Perimeter and line measurements were made with the sound level meter placed on a tripod at a height of approximately 1.5 meters (m) (5 feet) per IEEE Standard 656-1992. The use of five feet provides an approximate location of an individual's ear.

Transformer measurements were performed with the sound level meter placed on a tripod at a height of approximately 1/3 and 2/3 the height of the transformer and conducted at approximately 1 m (3 ft) intervals starting at the drain plug of the transformer and moving circularly around the transformer per IEEE Standard C57.12.90-2015 recommendations.

A separate log file was created on the sound level meter for each test location. File names and corresponding test locations were recorded during the test. All data was downloaded into a laptop computer and analyzed statistically. The records included results from each octave band from 8 Hz to 16 kHz.

General notes about each test location, including general noise observations, weather conditions, exact location (via GPS), time of measurement, and other pertinent facts were recorded at each site.

3.2 Test Locations

Six test locations along the property line were identified for measurements to be performed, these are locations P1-P6. One additional test was performed was along the prosed tie line, this is Location L1. As the substation is intended to operate continuously, 60-minute measurements were performed at each location during daytime operation (defined as 7:00 am to 10:00 pm) and nighttime operation (defined as 10:00 pm to 7:00 am). The two existing transformers were also measured to obtain sound power values for the existing equipment, these are locations T1 and T2. Figure 2 identifies the locations where measurements were taken.

Figure 2: Ambient Test Locations

Notes about testing:

- Noise from routine train traffic was observed and noted during the entire survey time frame.
- Noise from small light aircraft was observed and noted during the daytime portion of the survey
- Weather conditions – no inclement weather was encountered during testing.

3.3 Ambient Test L90 Sound Pressures dB(A)

Testing was conducted between Tuesday, May 12th, 2021 and Wednesday, May 13th, 2021 in which time both daytime and nighttime noise levels were obtained for each location along the property line.

A continuous 60-minute survey was recorded for each sample from which statistical data was compiled.

Transformers' measurements were conducted to obtain the sound power levels of the two existing station transformers, for inclusion in the analysis. A total of 26 measurements were performed for each transformer. Data collection at each of these 26 locations was collected for a duration of approximately one minute. Only the maximum recorded average of the 72 measurements was reported as it was the most conservative value and was used in all analysis.

From each test location, the statistical L_{90} value was recorded to serve as the base level of ambient noise for that survey point. Table 5 contains points that are along the City of Amherst property line as well as the maximum sound pressure recorded at the existing transformers.

TABLE 5: AMBIENT SOUND PRESSURE LEVEL L_{90} dB(A), PROPERTY LINE OF SUBSTATION

LOCATION	P1	P2	P3	P4	P5	P6	L1	Existing station transformers (Maximum)
Day	73.6	65.5	62.1	49.8	61.1	70.8	57.6	76.6
Night	71.1	63.8	45.3	42.7	41.5	42.4	N/A	n/a

4.0 ANALYSIS METHODOLOGY

The noise assessment of a substation under operating conditions requires these basic steps:

- Determine the applicable standards specific to the site.
- Characterizing the ambient noise present in the area.
- Develop a representative model of the new noise sources inside the substation.
- Analyzing the predicted sound pressure levels per the identified criteria.

The following sections generally discuss the methodology of each step. Where required, additional notes about the application of this methodology are included with the results in Section 5.0.

4.1 Sound Power Ratings for Existing Noise Sources

Sound power is the acoustic energy emitted by a source of sound and is an absolute value not affected by environmental conditions. Measured values only provide sound pressure levels, which is the pressure disturbance in the atmosphere influenced by both the source sound power and surrounding environmental conditions. Therefore, the sound power rating value is used in modeling for predictive analysis to account for variations in the environmental conditions that may or may not be present at the site.

4.2 Substation Noise Modeling

The acoustic modeling for this analysis was performed using the DataKustik GmbH, CadnaA (Computer Aided Noise Abatement) software package, version 2021 MR1.183. Noise propagation

characteristics in this software package are based upon *ISO 9613 "Acoustics – Attenuation of sound during propagation outdoors –Part 1: Calculation of the absorption of sound by the atmosphere and Part 2: General method of calculation.*

4.2.1 Environmental Impacts

CadnaA assumes the standard based prediction detailed in ISO 9613. Temperature, humidity, wind, terrain, barriers and vegetation all play a key factor in the absorption and propagation. As such, CadnaA allows for manipulation of these to mimic the area of interest. While the standard provides direction for adverse effects of wind, slight downwind that can represent most conditions with a gentle breeze of 1 to 5 m/s, other factors should be manipulated for the specific site or conservatism. Analysis of the Amherst #2 Substation area did not include manipulations of wind for any case as there was no significant wind measured at any of the locations while surveying ambient noise, and no prevailing wind direction was observed during the testing period.

4.2.2 Noise Sources

All transformers are modeled as point sources to represent the sound producing surface. This analysis at the Amherst #2 Substation only considers the power transformer as noise sources. Auxiliary transformers or air conditioning units on control buildings are not considered. All noise sources are modeled with the calculated sound power rating (L_w).

The software requires the noise source be described by the sound power level (PWL), which is the amount of energy generated from a sound source, without influence from the surroundings. PWL values for the transformer source was established based on the transformer specification to ensure the manufacturer's guarantee that the noise from the equipment as delivered shall not exceed maximum sound level limit of 82 dB(A) when measured at a distance of 1 m from the equipment when in service. Using receivers in the CadnaA model for testing, PWL values were increased until the 82 dB(A) limit was reached. This value was applied to the new transformer for use when checking to present the maximum anticipated noise in the prediction. A similar approach was used for the existing transformer using the measured 76.6 dB(A) to develop the PWL for both existing transformers.

4.2.3 Noise Receptors

Measurement locations are determined as required for the site based on noise ordinance requirements and sensitive receptors. Typical locations can include, but are not limited to fence line, property line, residential and commercial buildings. The height placement of the receptors is modeled at 1.5 m (~4.9 ft) to approximate the height of an individual's ear.

4.3 Summation of Noise Levels

To combine the results from the ambient noise survey at the Amherst #2 Substation site with the results of the model, the noise from new sources in each case modeled was added to the L_{90} noise level at each test location to produce a sum representative of the predicted future noise level for each case. Both the L_{90} values and model results are expressed in terms of decibels which are not summed

using linear arithmetic methods, rather they are summed logarithmically after converting the values into units of pressure, in this case Pascals. Once summed together they can be expressed as one result and expressed again in terms of decibels.

The formulas below were used to combine the L_{90} values with the values calculated for each case by the model and produce the predicted results.

Converting sound pressure in dB to pascals is done by:

$Lp = 20 \log\left(\frac{p}{p0}\right)$ is the basis for solving in terms of p, where: $p = p0 * 10^{\frac{Lp}{20}}$

where:

Lp = Sound pressure level in dB (L_{90})

p = measured pressure in Pa

p0 = reference pressure (.00002 Pa)

Summing sound pressures in pascals and returning to decibels is done by:

$$L(dB) = 10 \log\left(\left(\frac{p1}{p0}\right)^2 + \left(\frac{p2}{p0}\right)^2\right)$$

5.0 MODELING SPECIFICS AND RESULTS

5.1 Model Inputs

To develop a detailed propagation model that represents the area of analysis, the following details where used to update the CadnaA software.

ISO 9613 standard parameters were used for this analysis. Below is a list of Project specific assumptions:

- Terrain absolute elevations were obtained from Google Earth and elevations of the receptors and substation equipment were modeled relative to the absolute elevations.
- Ground attenuation – 1.0 inside and outside the substation
    - For the area outside the substation, which is mostly maintained lawn, a ground attenuation of 1.0 was used to account for the absorption from the ground suitable for vegetation.

5.2 Cases

- Case 1 – The new transformer installed and operating at maximum load and the existing transformers are operating at the maximum measured continuous operating values.

5.3 Results

Results produced for each case from the model shows the contribution at each testing location. Table 6 below tabulates this data and shows independent sound pressures in dB(A) from the equipment, the measured ambient conditions before they are summed, the noise after summation, as well as the perceived increase. The maximum continuous noise at each receptor location as well as the radiation pattern is shown in Appendix B in Figure 3.

TABLE 6: SOUND PRESSURE RESULTS dB(A), PROPERTY LINE OF SUBSTATION

LOCATION	P1	P2	P3	P4	P5	P6	Compliance Limit
Maximum Transformer Operation	52.2	52.6	59.0	52.9	53.7	51.9	**N/A**
Ambient Day L_{90}	73.6	65.5	62.1	49.8	61.1	70.8	**N/A**
Ambient Night L_{90}	71.1	63.8	45.3	42.7	41.5	42.4	**N/A**
Predicted Ambient Noise Night	71.2	64.1	59.2	53.3	53.4	52.4	**N/A**
Predicted Increase Above Ambient	0.1	0.3	13.9	10.6	11.9	10	**N/A**

The operation of the transformer is calculated to produce a maximum value of 59.0 dB(A) at the property line for maximum continuous operation. However, at the closest residential property, the maximum predicted value is 53.7 dB(A) which is below 55 dB(A) typical for residential limits and is considered as “plainly audible” for this analysis.

The perceived noise at the property line is highly susceptible to the ambient conditions due to summation of the noises. The largest increase of perceived noise in dB(A) along the property line will occur at location P5 under ambient nighttime conditions. This is equal to a 11.9 dB(A) increase from the transformer.

5.4 Continuous Operation Compliance Results

The sound level calculated around the substation perimeter (P1-P6), as a result of the new transformer were all below 60 dB(A) for nonresidential property boundaries and below 55 dB(A) for residential property boundaries.

6.0 CONCLUSION

The continuous maximum operating condition of the substation is not expected to exceed the limits imposed by the local resolution established by Amherst Township. The areas that show the largest

increase in sound pressure from the new sources are to the south and west of the substation as the transformer is located closer to the property line at these locations.

Construction noise for the tie line and the substation is anticipated to increase the ambient noise at a perceived value of over double. Similar to the existing train traffic in this area, the typical sound levels of construction noise experienced at any given residence will be sporadic and of limited duration and are anticipated to be perceivable as heavy city traffic to residential areas as referenced in Table 1.

APPENDIX A – REFERENCE DRAWINGS


Existing Substation
(Lat: 41.400845,
Long: -82.247440)
Proposed Route
Temporary Access Road
Survey Area
New House
Proposed Substation Expansion Area
Existing Amherst Substation
Road
Railroad
City of Amherst Owned Parcels
Parcel Boundary
Confidential, not for Public Distribution
Survey Area
Lorain county, Ohio
0
250
Feet
Amherst #2
Substation Expansion and
138 kV Transmission Line Project

APPENDIX B – CONTINUOUS NOISE– CONTOUR MAP

Figure 3: Calculated Noise Contour at Maximum Operation

APPENDIX J FAA CERTIFICATION LETTER

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2022-AGL-4431-OE

Issued Date: 03/03/2022

Kim Magovac
AMP-Kim Magovac
1111 Schrock Rd
Suite 100
Columbus, OH 43229

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Transmission Line Tower 1006B BVR-WDGS
Location:	Amherst, OH
Latitude:	41-24-06.58N NAD 83
Longitude:	82-15-07.81W
Heights:	702 feet site elevation (SE)
	142 feet above ground level (AGL)
	844 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 09/03/2023 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO

SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-AGL-4431-OE.

Signature Control No: 512174340-515797173 (DNE)
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

New Construction of Steel poles along 138kV Transmission Line

TOPO Map for ASN 2022-AGL-4431-OE

Sectional Map for ASN 2022-AGL-4431-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2022-AGL-4432-OE

Issued Date: 03/03/2022

Kim Magovac
AMP-Kim Magovac
1111 Schrock Rd
Suite 100
Columbus, OH 43229

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Transmission Line Tower 1006C BVR-WDGS
Location:	Amherst, OH
Latitude:	41-24-05.34N NAD 83
Longitude:	82-15-01.13W
Heights:	697 feet site elevation (SE)
	132 feet above ground level (AGL)
	829 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 09/03/2023 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO

SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-AGL-4432-OE.

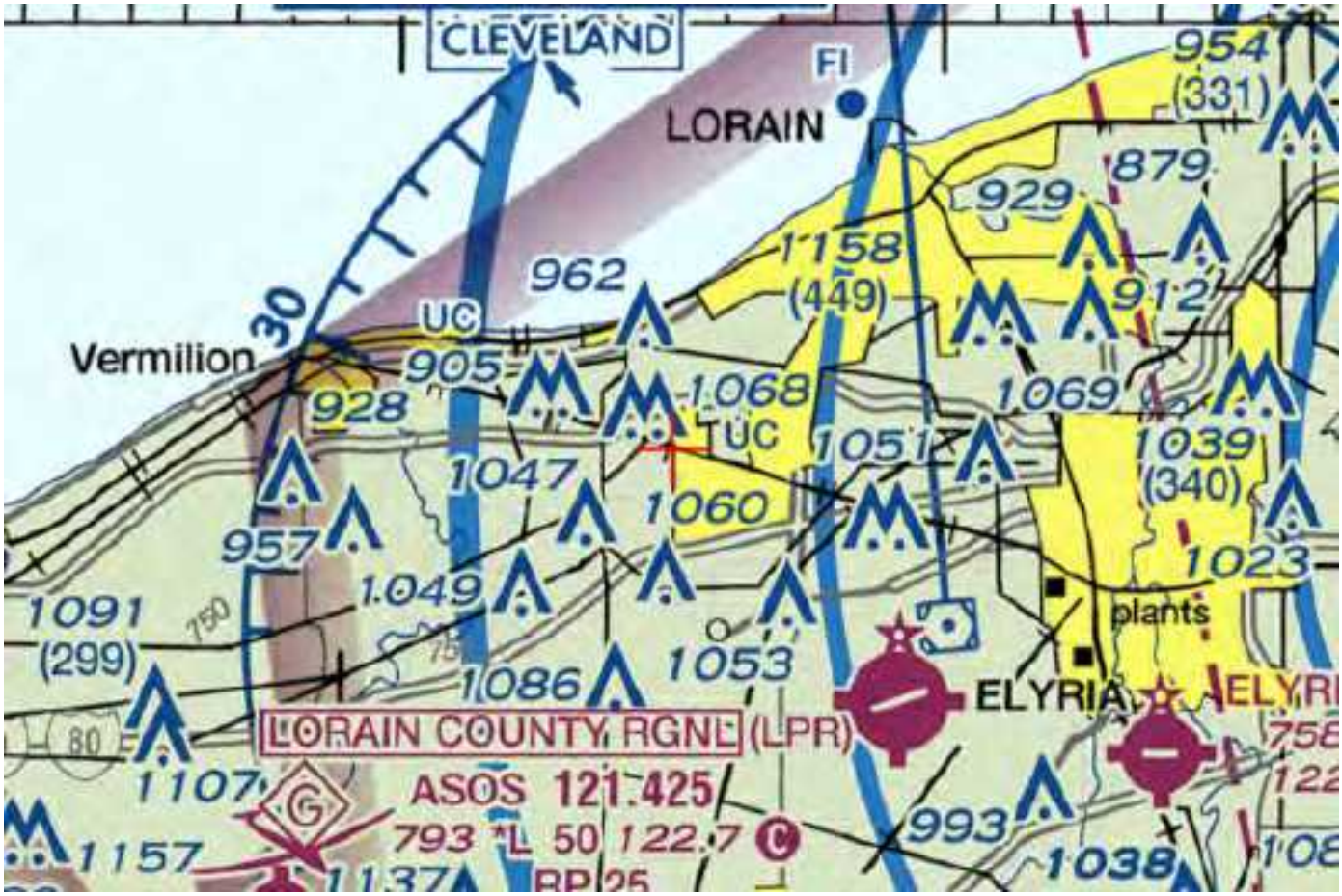
Signature Control No: 512174342-515797172 (DNE)
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

New Construction of Steel poles along 138kV Transmission Line

TOPO Map for ASN 2022-AGL-4432-OE

Sectional Map for ASN 2022-AGL-4432-OE



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Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2022-AGL-4433-OE

Issued Date: 03/03/2022

Kim Magovac
AMP-Kim Magovac
1111 Schrock Rd
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Columbus, OH 43229

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Transmission Line Tower 1006D BVR-WDGS
Location:	Amherst, OH
Latitude:	41-24-04.33N NAD 83
Longitude:	82-14-54.53W
Heights:	690 feet site elevation (SE)
	112 feet above ground level (AGL)
	802 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 09/03/2023 unless:

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If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-AGL-4433-OE.

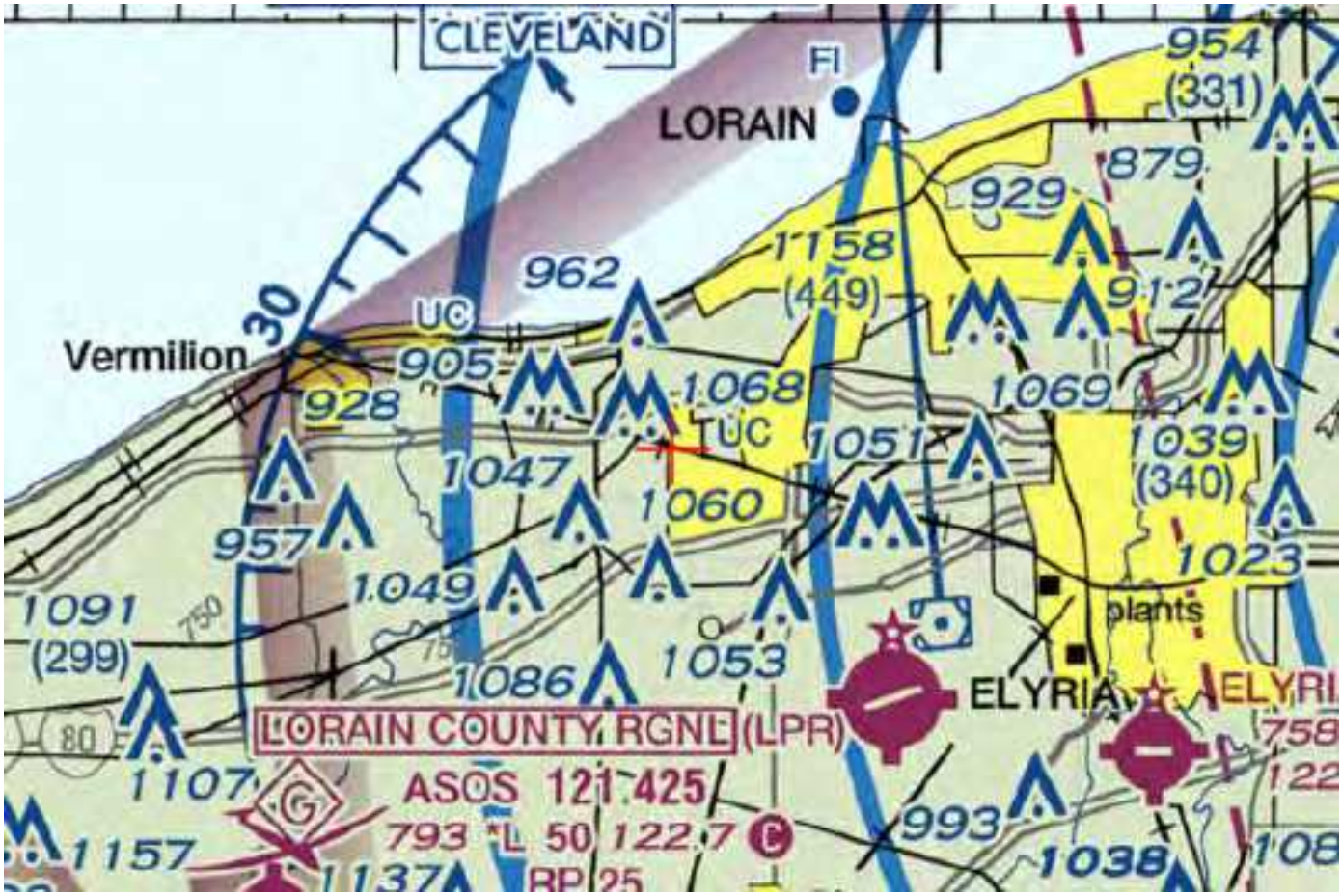
Signature Control No: 512174344-515797175 (DNE)
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

New Construction of Steel poles along 138kV Transmission Line

TOPO Map for ASN 2022-AGL-4433-OE

Sectional Map for ASN 2022-AGL-4433-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2022-AGL-4434-OE

Issued Date: 03/03/2022

Kim Magovac
AMP-Kim Magovac
1111 Schrock Rd
Suite 100
Columbus, OH 43229

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Transmission Line Tower 1006E BVR-WDGS
Location:	Amherst, OH
Latitude:	41-24-02.80N NAD 83
Longitude:	82-14-54.58W
Heights:	691 feet site elevation (SE)
	87 feet above ground level (AGL)
	778 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

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If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-AGL-4434-OE.

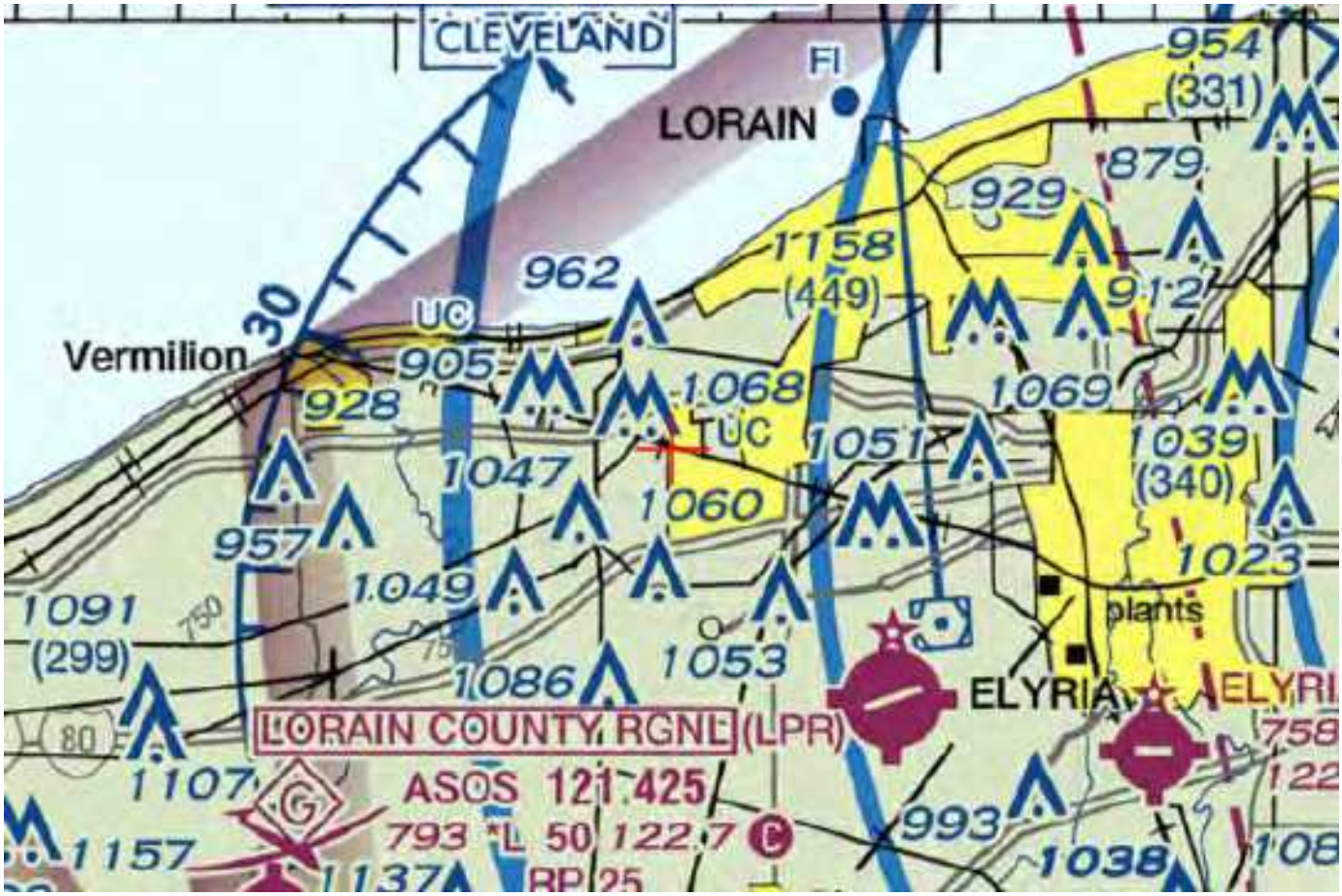
Signature Control No: 512174351-515797171 (DNE)
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

New Construction of Steel poles along 138kV Transmission Line

TOPO Map for ASN 2022-AGL-4434-OE

Sectional Map for ASN 2022-AGL-4434-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2022-AGL-4435-OE

Issued Date: 03/03/2022

Kim Magovac
AMP-Kim Magovac
1111 Schrock Rd
Suite 100
Columbus, OH 43229

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Transmission Line Tower 1006F BVR-WDGS
Location:	Amherst, OH
Latitude:	41-24-04.11N NAD 83
Longitude:	82-14-53.01W
Heights:	687 feet site elevation (SE)
	92 feet above ground level (AGL)
	779 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

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This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-AGL-4435-OE.

Signature Control No: 512174358-515797174 (DNE)
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

New Construction of Steel poles along 138kV Transmission Line

TOPO Map for ASN 2022-AGL-4435-OE

Sectional Map for ASN 2022-AGL-4435-OE

APPENDIX K EASEMENTS

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Proposed Easements

Line Name: Beaver-Woodings 138kV
Black River Woodings 138kV

Easement No.: 2022-007978-EASE
2022-007979-EASE

EASEMENT AND RIGHT OF WAY

On this _____ day of_____, 20____, in consideration of Ten and NO/100 Dollars ($10.00), and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and the covenants hereinafter set forth, Christopher Bartish, married, whose address is 1009 Apple Orchard Ln., Amherst, OH 44001, ("Grantor"), whether one or more persons, hereby grants, sells, conveys, and warrants to **AMP Transmission, LLC**, an Ohio limited liability company, whose principal business address is 1111 Schrock Road, Suite 100, Columbus, Ohio 43229, ("AMPT") and its successors, assigns, lessees and tenants a permanent easement and right of way ("Easement"), for electric transmission, distribution, and communication lines and appurtenant equipment and fixtures, being, in, on, over, under, through and across the following described lands of the Grantor, situated in the State of Ohio, Lorain County.

Grantor claims title by Deed Instrument Number 2021-0810449 recorded April 1, 2021, in the Lorain County Recorder's Office.

Auditor/Key/Tax Numbers: 05-00-003-106-030 and 05-00-098-000-147

Said lines and facilities shall be constructed within the limits of a strip of land (Easement Area), the centerline of which being said lines and the facilities as constructed. The approximate location is depicted on Exhibit "A", attached hereto and incorporated herein.

GRANTOR FURTHER GRANTS AMPT THE FOLLOWING RIGHTS:

The right, now or in the future, to construct, reconstruct, operate, maintain, alter, improve, extend, inspect and patrol (by ground or air), protect, repair, remove, replace, upgrade and relocate within the Easement Area, poles, towers, and structures, made of wood, metal, concrete or other materials, and crossarms, guys, anchors, grounding systems, and all other appurtenant equipment and fixtures, and to string conductors, wires and cables; together with the right to add to said facilities

from time to time, and the right to do anything necessary, useful or convenient for the enjoyment of the Easement herein granted.

The right, in AMPT's discretion, now or in the future, to cut down, trim, remove, and otherwise control, using herbicides or tree growth regulators or other means, any and all trees, overhanging branches, vegetation or brush situated within the Easement Area. AMPT shall also have the right to cut down, trim or remove trees situated on lands of Grantor which adjoin the Easement Area when in the opinion of AMPT those trees may endanger the safety of, or interfere with the construction, operation or maintenance of AMPT's facilities or ingress or egress to, from or along the Easement Area.

The right of unobstructed ingress and egress, at any and all times, over, across and along and upon the Easement Area, and across the adjoining lands of Grantor as may be necessary for access to and from the Easement Area for the above referenced purposes.

THIS GRANT IS SUBJECT TO THE FOLLOWING CONDITIONS:

The Grantor reserves the right to cultivate annual crops, pasture, construct fences (provided gates are installed that adequately provide AMPT the access rights conveyed herein) and roads or otherwise use the lands encumbered by this Easement in any way not inconsistent with the rights herein granted. In no event, however, shall Grantor, its heirs, successors, and assigns plant or cultivate any trees or place, construct, install, erect or permit any temporary or permanent building, structure, improvement or obstruction including but not limited to, storage tanks, billboards, signs, sheds, dumpsters, light poles, water impoundments, above ground irrigation systems, swimming pools or wells, or permit any alteration of the ground elevation, over, or within the Easement Area. AMPT may, at Grantor's cost, remove any structure or obstruction if placed within the Easement Area, and may re-grade any alterations of the ground elevation within the Easement Area.

AMPT agrees to repair or pay the Grantor for actual damages sustained by Grantor to crops, fences, gates, irrigation and drainage systems, drives, or lawns that are permitted herein, when such damages arise out of AMPT's exercise of the rights herein granted.

The failure of AMPT to exercise any of the rights granted herein, or the removal of any facilities from the Easement, shall not be deemed to constitute an abandonment or waiver of the rights granted herein.

This instrument contains the complete agreement, expressed or implied between the parties herein and shall inure to the benefit of and be binding on their respective successors, assigns, heirs, executors, administrators, lessees, tenants, and licensees.

This Easement may be executed in counterparts, each of which shall be deemed an original, but all of which, taken together, shall constitute one and the same instrument.

DECLARATION OF CONSIDERATION OF VALUE

Under the penalties of fine and imprisonment as provided by the law the undersigned (AMP Transmission, LLC) hereby declares the total consideration for the property transferred by this

document is and 00/100 Dollars ($0.00). Given under my hand this _____ day of _____, 2022.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK; SIGNATURE PAGE TO FOLLOW]

GRANTOR:

By: _____

Name: Christopher Bartish_____

GRANTEE:

AMP Transmission, LLC

By: _____

Name: _____

Title: _____

GRANTOR ACKNOWLEDGEMENT

STATE OF _____)
)ss:
COUNTY OF _____)

The foregoing instrument was acknowledged before me, _____, a Notary Public, this ____ day of _____, 20____ by Christopher Bartish, married.

_____
Notary Public

My Commission Expires: _____

(Notary Seal)

GRANTEE ACKNOWLEDGEMENT

STATE OF _____)
)ss:
COUNTY OF _____)

The foregoing instrument was acknowledged before me, _____, a Notary Public, this____ day of _____, 20_____ by _____, _____ of AMP Transmission, LLC, an Ohio limited liability company, on behalf of the limited liability company.

_____
Notary Public

My Commission Expires: _____

(Notary Seal)

CONSENT AND SUBORDINATION OF DOWER INTEREST

Hye Young Park, the spouse of Christopher Bartish, hereby consents to the foregoing Easement Agreement and subordinates her dower rights to the easements created herein.

_____
Hye Young Park

ACKNOWLEDGEMENT

STATE OF _____)
)ss:
COUNTY OF _____)

The foregoing instrument was acknowledged before me, _____, a Notary Public, this ____ day of _____, 20____ by Hye Young Park, spouse of Christopher Bartish.

_____
Notary Public

My Commission Expires: _____

(Notary Seal)

This Instrument was prepared by:

_____
Lisa G. McAlister
After recording return to:
AMP Transmission, LLC
1111 Schrock Road, Suite 100
Columbus, Ohio 43229

Line Name: Beaver-Woodings 138kV
Black River Woodings 138kV

Easement No.: 2022-007976-EASE
2022-007977-EASE

EASEMENT AND RIGHT OF WAY

On this _____ day of_____, 20___, in consideration of Ten and No/100 Dollars ($10.00), and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and the covenants hereinafter set forth, Joel P. Miller and Marcia E. Miller, husband and wife, whose address is 1016 N. Quarry Road, Amherst, OH 44001, ("Grantor"), whether one or more persons, hereby grants, sells, conveys, and warrants to **AMP Transmission, LLC**, an Ohio limited liability company, whose principal business address is 1111 Schrock Road, Suite 100, Columbus, Ohio 43229, ("AMPT") and its successors, assigns, lessees and tenants a permanent easement and right of way ("Easement"), for electric transmission, distribution, and communication lines and appurtenant equipment and fixtures, being, in, on, over, under, through and across the following described lands of the Grantor, situated in the State of Ohio, Lorain County.

Grantor claims title by Deed Instrument Number 2018-0695034, recorded November 14, 2018, in the Lorain County Recorder's Office, and by Deed Instrument Number 1997-048478, recorded August 20, 1997, in the Lorain County Recorder's Office.

Auditor/Key/Tax Numbers: 05-00-098-000-148 and 05-00-098-000-081

Said lines and facilities shall be constructed within the limits of a strip of land (Easement Area), the centerline of which being said lines and the facilities as constructed. The approximate location is depicted on Exhibit "A", attached hereto and incorporated herein.

GRANTOR FURTHER GRANTS AMPT THE FOLLOWING RIGHTS:

The right, now or in the future, to construct, reconstruct, operate, maintain, alter, improve, extend, inspect and patrol (by ground or air), protect, repair, remove, replace, upgrade and relocate within the Easement Area, poles, towers, and structures, made of wood, metal, concrete or other materials,

and crossarms, guys, anchors, grounding systems, and all other appurtenant equipment and fixtures, and to string conductors, wires and cables; together with the right to add to said facilities from time to time, and the right to do anything necessary, useful or convenient for the enjoyment of the Easement herein granted.

The right, in AMPT's discretion, now or in the future, to cut down, trim, remove, and otherwise control, using herbicides or tree growth regulators or other means, any and all trees, overhanging branches, vegetation or brush situated within the Easement Area. AMPT shall also have the right to cut down, trim or remove trees situated on lands of Grantor which adjoin the Easement Area when in the opinion of AMPT those trees may endanger the safety of, or interfere with the construction, operation or maintenance of AMPT's facilities or ingress or egress to, from or along the Easement Area.

The right of unobstructed ingress and egress, at any and all times, over, across and along and upon the Easement Area, and across the adjoining lands of Grantor as may be necessary for access to and from the Easement Area for the above referenced purposes.

THIS GRANT IS SUBJECT TO THE FOLLOWING CONDITIONS:

The Grantor reserves the right to cultivate annual crops, pasture, construct fences (provided gates are installed that adequately provide AMPT the access rights conveyed herein) and roads or otherwise use the lands encumbered by this Easement in any way not inconsistent with the rights herein granted. In no event, however, shall Grantor, its heirs, successors, and assigns plant or cultivate any trees or place, construct, install, erect or permit any temporary or permanent building, structure, improvement or obstruction including but not limited to, storage tanks, billboards, signs, sheds, dumpsters, light poles, water impoundments, above ground irrigation systems, swimming pools or wells, or permit any alteration of the ground elevation, over, or within the Easement Area. AMPT may, at Grantor's cost, remove any structure or obstruction if placed within the Easement Area, and may re-grade any alterations of the ground elevation within the Easement Area.

AMPT agrees to repair or pay the Grantor for actual damages sustained by Grantor to crops, fences, gates, irrigation and drainage systems, drives, or lawns that are permitted herein, when such damages arise out of AMPT's exercise of the rights herein granted.

The failure of AMPT to exercise any of the rights granted herein, or the removal of any facilities from the Easement, shall not be deemed to constitute an abandonment or waiver of the rights granted herein.

This instrument contains the complete agreement, expressed or implied between the parties herein and shall inure to the benefit of and be binding on their respective successors, assigns, heirs, executors, administrators, lessees, tenants, and licensees.

This Easement may be executed in counterparts, each of which shall be deemed an original, but all of which, taken together, shall constitute one and the same instrument.

DECLARATION OF CONSIDERATION OF VALUE

Under the penalties of fine and imprisonment as provided by the law the undersigned (AMP Transmission, LLC) hereby declares the total consideration for the property transferred by this

document is _____ and 0/100 Dollars ($0.00). Given under my hand this _____ day of _____, 2021.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK; SIGNATURE PAGE TO FOLLOW]

GRANTOR:

By: _____

Name: Joel P. Miller_____

By: _____

Name: Marcia E. Miller_____

GRANTEE:

AMP Transmission, LLC

By: _____

Name: _____

Title: _____

GRANTOR ACKNOWLEDGEMENT

STATE OF _____)
)ss:
COUNTY OF _____)

The foregoing instrument was acknowledged before me, _____, a Notary Public, this ____ day of _____, 20_____ by Joel P. Miller and Marcia E. Miller, husband and wife.

_____
Notary Public

My Commission Expires: _____

(Notary Seal)

GRANTEE ACKNOWLEDGEMENT

STATE OF _____)
)ss:
COUNTY OF _____)

The foregoing instrument was acknowledged before me, _____, a Notary Public, this____ day of _____, 20_____ by _____, _____ of _____ a _____ limited liability company, on behalf of the limited liability company.

_____
Notary Public

My Commission Expires: _____

(Notary Seal)

This Instrument was prepared by:

_____
Lisa G. McAlister
After recording return to:
AMP Transmission, LLC
1111 Schrock Road, Suite 100
Columbus, Ohio 43229

Line Name: Beaver-Woodings 138kV
Black River Woodings 138kV

Easement No.: 2022-007975-EASE

EASEMENT AND RIGHT OF WAY

On this _____ day of _____, 20____, in consideration of Ten and No/100 Dollars ($10.00), and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and the covenants hereinafter set forth, Samuel Silva and Susanne M. Silva, married, whose address is 1025 N. Quarry Rd., Amherst, OH 44001, ("Grantor"), whether one or more persons, hereby grants, sells, conveys, and warrants to **AMP Transmission, LLC**, an Ohio limited liability company, whose principal business address is 1111 Schrock Road, Suite 100, Columbus, Ohio 43229, ("AMPT") and its successors, assigns, lessees and tenants a permanent easement and right of way ("Easement"), for electric transmission, distribution, and communication lines and appurtenant equipment and fixtures, being, in, on, over, under, through and across the following described lands of the Grantor, situated in the State of Ohio, Lorain County.

Grantor claims title by Deed Instrument Number 2018-065959, recorded March 26, 2018, in the Lorain County Recorder's Office.

Auditor/Key/Tax Number: 05-00-098-000-085

Said lines and facilities shall be constructed within the limits of a strip of land (Easement Area), the centerline of which being said lines and the facilities as constructed. The approximate location is depicted on Exhibit "A", attached hereto and incorporated herein.

GRANTOR FURTHER GRANTS AMPT THE FOLLOWING RIGHTS:

The right, now or in the future, to construct, reconstruct, operate, maintain, alter, improve, extend, inspect and patrol (by ground or air), protect, repair, remove, replace, upgrade and relocate within the Easement Area, poles, towers, and structures, made of wood, metal, concrete or other materials, and crossarms, guys, anchors, grounding systems, and all other appurtenant equipment and fixtures, and to string conductors, wires and cables; together with the right to add to said facilities

from time to time, and the right to do anything necessary, useful or convenient for the enjoyment of the Easement herein granted.

The right, in AMPT's discretion, now or in the future, to cut down, trim, remove, and otherwise control, using herbicides or tree growth regulators or other means, any and all trees, overhanging branches, vegetation or brush situated within the Easement Area. AMPT shall also have the right to cut down, trim or remove trees situated on lands of Grantor which adjoin the Easement Area when in the opinion of AMPT those trees may endanger the safety of, or interfere with the construction, operation or maintenance of AMPT's facilities or ingress or egress to, from or along the Easement Area.

The right of unobstructed ingress and egress, at any and all times, over, across and along and upon the Easement Area, and across the adjoining lands of Grantor as may be necessary for access to and from the Easement Area for the above referenced purposes.

THIS GRANT IS SUBJECT TO THE FOLLOWING CONDITIONS:

The Grantor reserves the right to cultivate annual crops, pasture, construct fences (provided gates are installed that adequately provide AMPT the access rights conveyed herein) and roads or otherwise use the lands encumbered by this Easement in any way not inconsistent with the rights herein granted. In no event, however, shall Grantor, its heirs, successors, and assigns plant or cultivate any trees or place, construct, install, erect or permit any temporary or permanent building, structure, improvement or obstruction including but not limited to, storage tanks, billboards, signs, sheds, dumpsters, light poles, water impoundments, above ground irrigation systems, swimming pools or wells, or permit any alteration of the ground elevation, over, or within the Easement Area. AMPT may, at Grantor's cost, remove any structure or obstruction if placed within the Easement Area, and may re-grade any alterations of the ground elevation within the Easement Area.

AMPT agrees to repair or pay the Grantor for actual damages sustained by Grantor to crops, fences, gates, irrigation and drainage systems, drives, or lawns that are permitted herein, when such damages arise out of AMPT's exercise of the rights herein granted.

The failure of AMPT to exercise any of the rights granted herein, or the removal of any facilities from the Easement, shall not be deemed to constitute an abandonment or waiver of the rights granted herein.

This instrument contains the complete agreement, expressed or implied between the parties herein and shall inure to the benefit of and be binding on their respective successors, assigns, heirs, executors, administrators, lessees, tenants, and licensees.

This Easement may be executed in counterparts, each of which shall be deemed an original, but all of which, taken together, shall constitute one and the same instrument.

DECLARATION OF CONSIDERATION OF VALUE

Under the penalties of fine and imprisonment as provided by the law the undersigned (AMP Transmission, LLC) hereby declares the total consideration for the property transferred by this

document is and 00/100 Dollars ($0.00). Given under my hand this _____ day of _____, 2022.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK; SIGNATURE PAGE TO FOLLOW]

GRANTOR:

By: _____

Name: Samuel Silva_____

By: _____

Name: Susanne M. Silva_____

GRANTEE:

AMP Transmission, LLC

By: _____

Name: _____

Title: _____

GRANTOR ACKNOWLEDGEMENT

STATE OF _____)
)ss:
COUNTY OF _____)

The foregoing instrument was acknowledged before me, _____, a Notary Public, this ____ day of _____, 20_____ by Samuel Silva and Susanne M. Silva, married.

_____
Notary Public

My Commission Expires: _____

(Notary Seal)

GRANTEE ACKNOWLEDGEMENT

STATE OF _____)
)ss:
COUNTY OF _____)

The foregoing instrument was acknowledged before me, _____, a Notary Public, this____ day of _____, 20____, by _____, _____ of AMP Transmission, LLC an Ohio limited liability company, on behalf of the limited liability company.

_____
Notary Public

My Commission Expires: _____

(Notary Seal)

This Instrument was prepared by:

_____
Lisa G. McAlister
After recording return to:
AMP Transmission, LLC
1111 Schrock Road, Suite 100
Columbus, Ohio 43229

Legal Descriptions and Exhibit A

Baumann Land Survey, Inc.
P.O. Box 14834
Cincinnati, OH 45250
(513) 860-3999
www.BaumannLSI.com

April 6, 2022

Legal Description – 0.5264 Ac. Right of Way Easement Area
Original Lot 98, Town 6 North, Range 18 West,
Connecticut Western Reserve
Amherst Township, City of Amherst, Lorain County, Ohio

Situate in Original Lot 98, Town 6 North, Range 18 West of the Connecticut Western Reserve, Amherst Township, City of Amherst, Lorain County, Ohio, and being part of a tract conveyed to Christopher Bartish in Instrument No. 2021-0810449, and being more particularly described as follows:

Beginning at the intersection of the east line of said Original Lot 98 and the southerly right of way line of the Pennsylvania Lines LLC railroad right of way at the northeast corner of said Bartish tract, thence, along the east line of said Original Lot 98 and the east line of said Bartish tract, South 00°35'12" West for a distance of 101.80 feet to a point;

Thence, leaving the east line of said Original Lot 98 and the east line of said Bartish tract, and through said Bartish tract, North 78°37'48" West for a distance of 229.30 feet to a point in the west line of said Bartish tract and the east line of a tract conveyed to Joel P. Miller and Marcia E. Miller in Instrument No. 2018-0695034;

Thence, along the west line of said Bartish tract and along the east line of said Miller tract, North 00°35'12" East for a distance of 101.80 feet to a point in the southerly right of way line of the Pennsylvania Lines LLC railroad right of way at the northwest corner of said Bartish tract and the northeast corner of said Miller tract.

Thence, along the southerly right of way line of the Pennsylvania Lines LLC railroad right of way and along the north line of said Bartish tract, South 78°37'48" East for a distance of 229.30 feet to the Point of Beginning;

Containing 22,930 square feet, 0.5264 acres;

Subject to existing easements and rights of way;

Based on a survey performed by Baumann Land Survey, Inc.

Bearings based on the Ohio North Zone State Plane Coordinate System NAD83(2011)

Deed Reference: Instrument No.2021-0810449

Prepared by: Baumann Land Survey, Inc., Thomas P. Baumann, PS, Ohio Surveyor #: S-7450

April 6, 2022

Legal Description – 0.6151 Ac. Right of Way Easement Area
Original Lot 3, Town 6 North, Range 18 West,
Connecticut Western Reserve
Amherst Township, City of Amherst, Lorain County, Ohio

Baumann Land Survey, Inc.
P.O. Box 14834
Cincinnati, OH 45250
(513) 860-3999
www.BaumannLSI.com

Situate in Original Lot 3, Town 6 North, Range 18 West of the Connecticut Western Reserve, Amherst Township, City of Amherst, Lorain County, Ohio, and being part of a tract conveyed to Christopher Bartish in Instrument No. 2021-0810449, and being more particularly described as follows:

Beginning at the intersection of the west line of said Original Lot 3 and the southerly right of way line of the Pennsylvania Lines LLC railroad right of way at the northwest corner of said Bartish tract, thence, along the southerly right of way line of the Pennsylvania Lines LLC railroad right of way and the north line of said Bartish tract, South 78°37'48" East for a distance of 206.71 feet to a point in the southerly right of way line of the Pennsylvania Lines LLC railroad right of way at the northeast corner of said Bartish tract and the northwest corner of a tract conveyed to The City of Amherst in Volume 925, Page 828;

Thence, leaving the southerly right of way line of the Pennsylvania Lines LLC railroad right of way, and along an easterly line of said Bartish tract and along a westerly line of said The City of Amherst tract, South 35°52'58" West for a distance of 178.35 feet to an easterly corner of said Bartish tract and a westerly corner of said The City of Amherst tract;

Thence, along an easterly line of said Bartish tract and along a westerly line of said The City of Amherst tract, South 00°42'48" West for a distance of 90.73 feet to a point;

Thence, leaving an easterly line of said Bartish tract and a westerly line of said The City of Amherst tract, and through said Bartish tract, North 88°29'02" West for a distance of 51.75 feet to a point;

Thence, through said Bartish tract, North 01°09'13" East for a distance of 162.88 feet to a point;

Thence, through said Bartish tract, North 78°37'48" West for a distance of 50.57 feet to a point in the west line of said Original Lot 3 and in the west line of said Bartish tract;

Thence, along the west line of said Original Lot 3 and along the west line of said Bartish tract, North 00°35'12" East for a distance of 101.80 feet to the Point of Beginning;

Containing 26,792 square feet, 0.6151 acres;

Subject to existing easements and rights of way;

Based on a survey performed by Baumann Land Survey, Inc.

Bearings based on the Ohio North Zone State Plane Coordinate System NAD83(2011)

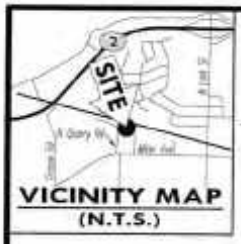
Deed Reference: Instrument No.2021-0810449

Prepared by: Baumann Land Survey, Inc., Thomas P. Baumann, PS, Ohio Surveyor #: S-7450

4-6-2022

STATE OF OHIO
THOMAS P. BAUMANN
7450
REGISTERED PROFESSIONAL SURVEYOR

EXHIBIT "A"



ADJOINING LANDOWNER
JOEL P. MILLER AND MARCIA E. MILLER
PIDN 05-00-098-000-148

N0°35'12"E 101.80'

AMOH-05
LANDOWNER
CHRISTOPHER BARTISH
PIDN 05-00-098-000-147
INST.2021-0810449

100' WIDE RIGHT OF WAY
EASEMENT AREA
CONTAINING 0.5264± ACRES

N78°37'48"W 229.30'

S78°37'48"E 229.30'

100'

P.O.B.
0.5264± ACRES
RIGHT OF WAY
EASEMENT AREA

P.O.B.
0.6151± ACRES
RIGHT OF WAY
EASEMENT AREA

AMOH-04
LANDOWNER
CHRISTOPHER BARTISH
PIDN 05-00-003-106-030
INST.2021-0810449

Lot 96
Lot 3

S0°35'12"W 101.80'

N78°37'48"W
50.57'

N1°09'13"E 162.88'

51.75'
N88°29'02"W

RIGHT OF WAY EASEMENT AREA
CONTAINING 0.6151± ACRES

ADJOINING LANDOWNER
PENNSYLVANIA LINES LLC
PIDN 05-00-098-500-001

S78°37'48"E 206.71'

S0°42'48"W 90.73'

S35°52'58"W 178.35'

ADJOINING LANDOWNER
THE CITY OF AMHERST
PIDN 05-00-003-106-020

STATE OF OHIO
THOMAS P. BAUMANN
7450
REGISTERED PROFESSIONAL SURVEYOR

4-4-2022

NOTES:
This drawing was prepared for the limited use of AMP Transmission, LLC for easement purposes only and is not intended to represent a complete survey of the property.

Bearings shown hereon are based on the Ohio North Zone State Plane Coordinate System NAD83(2011)

THOMAS P. BAUMANN, PS
OHIO PROFESSIONAL SURVEYOR NO. S-7450

4-4-2022
DATE

0 60 120

NORTH

SURV PROJ.#: 22634

LINE NAME: BEAVER-WOODINGS 138KV
BLACK RIVER WOODINGS 138KV
EASEMENT NUMBER: 2022-007978-EASE
2022-007979-EASE

LEGEND

P.O.B.	POINT OF BEGINNING
P.O.C.	POINT OF COMMENCEMENT
R/W	ROAD/RAIL RIGHT OF WAY LINE
℄	PROPERTY LINE
	RIGHT OF WAY EASEMENT AREA

AMP TRANSMISSION, LLC

RIGHT OF WAY EASEMENT AREA
CONTAINING 1.1415 ACRES - COMBINED ACREAGE OF BOTH PARCELS
ACROSS THE LANDS OF CHRISTOPHER BARTISH
SITUATED IN THE AMHERST TOWNSHIP ORIGINAL LOT NO.3 AND LOT NO.98,
TOWN 6 NORTH, RANGE 18 WEST CONNECTICUT WESTERN RESERVE
AMHERST TOWNSHIP, CITY OF AMHERST, LORAIN COUNTY, OHIO

SCALE: 1"= 60'	DATE: 04.06.2022	FILE:	SHEET: 1 OF 1

BAUMANN LAND SURVEY, INC.
P.O. BOX 14834, CINCINNATI, OH 45250
513.860.3999 WWW.BAUMANNLS1.COM
PROJECT: 22634, DRAWING: 14405

April 6, 2022

Legal Description – 0.9548 Ac. Right of Way Easement Area
Original Lot 98, Town 6 North, Range 18 West,
Connecticut Western Reserve
Amherst Township, City of Amherst, Lorain County, Ohio

Baumann Land Survey, Inc.
P.O. Box 14834
Cincinnati, OH 45250
(513) 860-3999
www.BaumannLSI.com

Situate in Original Lot 98, Town 6 North, Range 18 West of the Connecticut Western Reserve, Amherst Township, City of Amherst, Lorain County, Ohio, and being part of a tract conveyed to Joel P. Miller and Marcia E. Miller in Instrument No. 1997-0484787, and being more particularly described as follows:

Beginning at the northeasterly corner of the right of way of North Quarry Road in the southerly right of way line of the Pennsylvania Lines LLC railroad right of way, thence along the southerly right of way line of the Pennsylvania Lines LLC railroad right of way and along a northerly line of said Miller tract, South 76°20'48" East for a distance of 432.77 feet to a point;

Thence continuing along the southerly right of way line of the Pennsylvania Lines LLC railroad right of way and along a northerly line of said Miller tract, South 78°37'48" East for a distance of 16.82 feet to a point in the southerly right of way line of said Pennsylvania Lines LLC railroad right of way at a northeasterly corner of said Miller tract;

Thence, leaving the southerly right of way line of said Pennsylvania Lines LLC railroad right of way and along an easterly line of said Miller tract, South 30°58"58" West for a distance of 105.46 feet to a point;

Thence, leaving an easterly line of said Miller tract and through said Miller tract, North 76°20'48" West for a distance of 318.45 feet to a point in the easterly right of way line of North Quarry Road;

Thence, along the easterly right of way line of North Quarry Road, North 61°15'47" West for a distance of 68.46 feet to a point;

Thence, continuing along the easterly right of way line of North Quarry Road, along a curve to the right having a radius of 37.50 feet, an arc length of 44.49 feet, a central angle of 67°58'55", a chord bearing North 27°16'19" West, and a chord length of 41.93 feet to a point;

Thence, continuing along the easterly right of way line of North Quarry Road, North 06°43'08" East for a distance of 50.88 feet to the Point of Beginning;

Containing 41,592 square feet, 0.9548 acres;

Subject to existing easements and rights of way;

Based on a survey performed by Baumann Land Survey, Inc.

Bearings based on the Ohio North Zone State Plane Coordinate System NAD83(2011)

Deed Reference: Instrument No.1997-0484787

Prepared by: Baumann Land Survey, Inc., Thomas P. Baumann, PS, Ohio Surveyor #: S-7450

4-6-2022
STATE OF OHIO
THOMAS P. BAUMANN
7450
PROFESSIONAL SURVEYOR

Baumann Land Survey, Inc.
P.O. Box 14834
Cincinnati, OH 45250
(513) 860-3999
www.BaumannLSI.com

April 6, 2022

Legal Description – 0.4165 Ac. Right of Way Easement Area
Original Lot 98, Town 6 North, Range 18 West,
Connecticut Western Reserve
Amherst Township, City of Amherst, Lorain County, Ohio

Situate in Original Lot 98, Town 6 North, Range 18 West of the Connecticut Western Reserve, Amherst Township, City of Amherst, Lorain County, Ohio, and being part of a tract conveyed to Joel P. Miller and Marcia E. Miller in Instrument No. 2018-0695034, and being more particularly described as follows:

Beginning at the northeasterly corner of the right of way of North Quarry Road in the southerly right of way line of the Pennsylvania Lines LLC railroad right of way, thence along the southerly right of way line of the Pennsylvania Lines LLC railroad right of way and along a northerly line of a tract conveyed to Joel P. Miller and Marcia E. Miller in Instrument No. 1997-0484787, South 76°20'48" East for a distance of 432.77 feet to a point;

Thence continuing along the southerly right of way line of the Pennsylvania Lines LLC railroad right of way and along a northerly line of the latter said Miller tract, South 78°37'48" East for a distance of 16.82 feet to a point in the southerly right of way line of said Pennsylvania Lines LLC railroad right of way at a northwesterly corner of the former said Miller tract and the northeast corner of the latter said Miller tract and the Point of Beginning;

Thence, from the Point of Beginning, continuing along the southerly right of way line of said Pennsylvania Lines LLC railroad right of way and along the north line of the former said Miller tract, South 78°37'48" East for a distance of 154.15 feet to a point in the southerly right of way line of said Pennsylvania Lines LLC railroad right of way at the northeast corner of the former said Miller tract and the northwest corner of a tract conveyed to Christopher Bartish in Instrument No. 2021-0810449;

Thence, leaving the southerly right of way line of said Pennsylvania Lines LLC railroad right of way, and along the east line of the former said Miller tract and the west line of said Bartish tract, South 00°35'12" West for a distance of 101.80 feet to a point;

Thence, leaving the east line of the former said Miller tract and the west line of said Bartish tract, and through the former said Miller tract, North 78°37'48" West for a distance of 192.02 feet to a point;

Thence, continuing through the former said Miller tract, North 76°20'48" West for a distance of 16.59 feet to a point in a westerly line of the former said Miller tract and in an easterly line of the latter said Miller tract;

Thence, along a westerly line of the former said Miller tract and along an easterly line of the latter said Miller tract; North 30°58'58" East for a distance of 105.46 feet to the Point of Beginning;

Containing 18,144 square feet, 0.4165 acres;

Subject to existing easements and rights of way;

Based on a survey performed by Baumann Land Survey, Inc.

Bearings based on the Ohio North Zone State Plane Coordinate System NAD83(2011)

Deed Reference: Instrument No.2018-0695034

Prepared by: Baumann Land Survey, Inc., Thomas P. Baumann, PS, Ohio Surveyor #: S-7450

4-6-2022
STATE OF OHIO
THOMAS P BAUMANN
7450
REGISTERED
PROFESSIONAL SURVEYOR

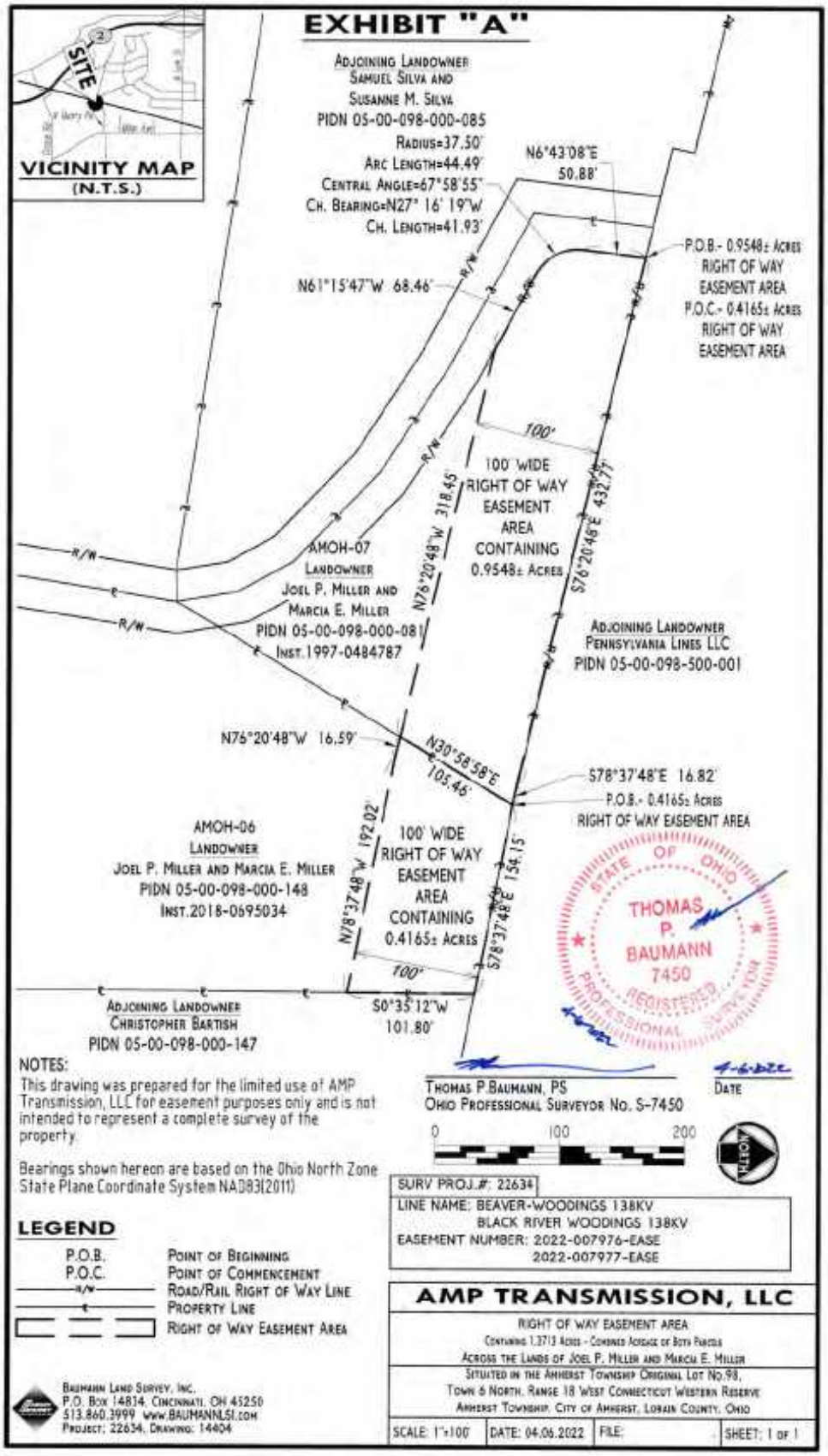


EXHIBIT "A"
VICINITY MAP
(N.T.S.)
SITE
ADJOINING LANDOWNER
SAMUEL SILVA AND
SUSANNE M. SILVA
PIDN 05-00-098-000-085
RADIUS=37.50'
ARC LENGTH=44.49'
CENTRAL ANGLE=67°58'55"
CH. BEARING=N27° 16' 19"W
CH. LENGTH=41.93'
N6°43'08"E
50.88'
P.O.B.- 0.9548± ACRES
RIGHT OF WAY
EASEMENT AREA
P.O.C.- 0.4165± ACRES
RIGHT OF WAY
EASEMENT AREA
N61°15'47"W 68.46'
100'
100' WIDE
RIGHT OF WAY
EASEMENT
AREA
CONTAINING
0.9548± ACRES
318.45'
N76°20'48"W
S76°20'48"E 432.77'
AMOH-07
LANDOWNER
JOEL P. MILLER AND
MARCIA E. MILLER
PIDN 05-00-098-000-081
INST.1997-0484787
ADJOINING LANDOWNER
PENNSYLVANIA LINES LLC
PIDN 05-00-098-500-001
N76°20'48"W 16.59'
N30°58'58"E
105.46'
S78°37'48"E 16.82'
P.O.B.- 0.4165± ACRES
RIGHT OF WAY EASEMENT AREA
AMOH-06
LANDOWNER
JOEL P. MILLER AND MARCIA E. MILLER
PIDN 05-00-098-000-148
INST.2018-0695034
100' WIDE
RIGHT OF WAY
EASEMENT
AREA
CONTAINING
0.4165± ACRES
192.02'
N78°37'48"W
S78°37'48"E 154.15'
100'
ADJOINING LANDOWNER
CHRISTOPHER BARTISH
PIDN 05-00-098-000-147
S0°35'12"W
101.80'
STATE OF OHIO
THOMAS P. BAUMANN
7450
REGISTERED
PROFESSIONAL SURVEYOR
NOTES:
This drawing was prepared for the limited use of AMP Transmission, LLC for easement purposes only and is not intended to represent a complete survey of the property.
Bearings shown hereon are based on the Ohio North Zone State Plane Coordinate System NAD83(2011)
THOMAS P.BAUMANN, PS
OHIO PROFESSIONAL SURVEYOR NO. S-7450
DATE
0
100
200
NORTH
SURV PROJ.#: 22634
LINE NAME: BEAVER-WOODINGS 138KV
BLACK RIVER WOODINGS 138KV
EASEMENT NUMBER: 2022-007976-EASE
2022-007977-EASE
LEGEND
P.O.B. POINT OF BEGINNING
P.O.C. POINT OF COMMENCEMENT
R/W ROAD/RAIL RIGHT OF WAY LINE
℄ PROPERTY LINE
RIGHT OF WAY EASEMENT AREA
AMP TRANSMISSION, LLC
RIGHT OF WAY EASEMENT AREA
CONTAINING 1.3713 ACRES - COMBINED ACREAGE OF BOTH PARCELS
ACROSS THE LANDS OF JOEL P. MILLER AND MARCIA E. MILLER
SITUATED IN THE AMHERST TOWNSHIP ORIGINAL LOT NO.98,
TOWN 6 NORTH, RANGE 18 WEST CONNECTICUT WESTERN RESERVE
AMHERST TOWNSHIP, CITY OF AMHERST, LORAIN COUNTY, OHIO
SCALE: 1"=100'
DATE: 04.06.2022
FILE:
SHEET: 1 OF 1
BAUMANN LAND SURVEY, INC.
P.O. BOX 14834, CINCINNATI, OH 45250
513.860.3999 WWW.BAUMANNLSI.COM
PROJECT: 22634, DRAWING: 14404

Baumann Land Survey, Inc.
P.O. Box 14834
Cincinnati, OH 45250
(513) 860-3999
www.BaumannLSI.com

April 6, 2022

Legal Description – 1.6965 Ac. Right of Way Easement Area
Original Lot 98, Town 6 North, Range 18 West,
Connecticut Western Reserve
Amherst Township, City of Amherst, Lorain County, Ohio

Situate in Original Lot 98, Town 6 North, Range 18 West of the Connecticut Western Reserve, Amherst Township, City of Amherst, Lorain County, Ohio, and being part of a tract conveyed to Samuel Silva and Susanne M. Silva in Instrument No. 2018-0665959, and being more particularly described as follows:

Beginning at the northwesterly corner of the right of way of North Quarry Road in the southerly right of way line of the Pennsylvania Lines LLC railroad right of way, thence along the westerly right of way line of North Quarry Road and along an easterly line of said Silva tract, South 06°43'08" West for a distance of 100.72 feet to a point;

Thence, leaving the westerly right of way line of North Quarry Road and an easterly line of said Silva tract, and through said Silva tract, North 76°25'39" West for a distance of 50.97 feet to a point;

Thence, continuing through said Silva tract, North 77°57'46" West for a distance of 706.42 feet to a point in a westerly line of said Silva tract and in an easterly line of a tract conveyed to the Ohio Edison Company in Volume 193, Page 281 and Volume 487, Page 325;

Thence, along a westerly line of said Silva tract and along an easterly line of said Ohio Edison Company tract, North 27°24'06" East for a distance of 103.71 feet to a point;

Thence, leaving a westerly line of said Silva tract and an easterly line of said Ohio Edison Company tract, and through said Silva tract, South 77°57'46" East for a distance of 680.28 feet to a northerly corner of said Silva tract and a southerly corner of said Pennsylvania Lines LLC railroad right of way;

Thence, along a northerly line of said Silva tract and along the southerly right of way line of said Pennsylvania Lines LLC railroad right of way, South 76°25'39" East for a distance of 40.30 feet to the Point of Beginning;

Containing 73,899 square feet, 1.6965 acres;

Subject to existing easements and rights of way;

Based on a survey performed by Baumann Land Survey, Inc.

Bearings based on the Ohio North Zone State Plane Coordinate System NAD83(2011)

Deed Reference: Instrument No.2018-0665959

Prepared by: Baumann Land Survey, Inc., Thomas P. Baumann, PS, Ohio Surveyor #: S-7450

April 6, 2022

Legal Description – 0.0184 Ac. Permanent Access Easement Area
Original Lot 98, Town 6 North, Range 18 West,
Connecticut Western Reserve
Amherst Township, City of Amherst, Lorain County, Ohio

Baumann Land Survey, Inc.
P.O. Box 14834
Cincinnati, OH 45250
(513) 860-3999
www.BaumannLSI.com

Situate in Original Lot 98, Town 6 North, Range 18 West of the Connecticut Western Reserve, Amherst Township, City of Amherst, Lorain County, Ohio, and being part of a tract conveyed to Samuel Silva and Susanne M. Silva in Instrument No. 2018-0665959, and being more particularly described as follows:

Commencing at the northwesterly corner of the right of way of North Quarry Road in the southerly right of way line of the Pennsylvania Lines LLC railroad right of way, thence along the westerly right of way line of North Quarry Road and along an easterly line of said Silva tract, South 06°43'08" West for a distance of 100.72 feet to a point;

Thence, leaving the westerly right of way line of North Quarry Road and an easterly line of said Silva tract, and through said Silva tract, North 76°25'39" West for a distance of 50.97 feet to a point;

Thence, continuing through said Silva tract, North 77°57'46" West for a distance of 503.05 feet to the Point of Beginning;

Thence, from the Point of Beginning, continuing through said Silva tract, South 68°32'27" West for a distance of 46.54 feet to a point;

Thence, continuing through said Silva tract, North 30°36'56" West for a distance of 34.92 feet to a point;

Thence, continuing through said Silva tract, South 77°57'46" East for a distance of 62.48 feet to the Point of Beginning;

Containing 802 square feet, 0.0184 acres;

Subject to existing easements and rights of way;

Based on a survey performed by Baumann Land Survey, Inc.

Bearings based on the Ohio North Zone State Plane Coordinate System NAD83(2011)

Deed Reference: Instrument No.2018-0665959

Prepared by: Baumann Land Survey, Inc., Thomas P. Baumann, PS, Ohio Surveyor #: S-7450

Baumann Land Survey, Inc.
P.O. Box 14834
Cincinnati, OH 45250
(513) 860-3999
www.BaumannLSI.com

April 6, 2022

Legal Description – 0.0124 Ac. Permanent Access Easement Area
Original Lot 98, Town 6 North, Range 18 West,
Connecticut Western Reserve
Amherst Township, City of Amherst, Lorain County, Ohio

Situate in Original Lot 98, Town 6 North, Range 18 West of the Connecticut Western Reserve, Amherst Township, City of Amherst, Lorain County, Ohio, and being part of a tract conveyed to Samuel Silva and Susanne M. Silva in Instrument No. 2018-0665959, and being more particularly described as follows:

Commencing at the northwesterly corner of the right of way of North Quarry Road in the southerly right of way line of the Pennsylvania Lines LLC railroad right of way, thence along the westerly right of way line of North Quarry Road and along an easterly line of said Silva tract, South 06°43'08" West for a distance of 100.72 feet to a point;

Thence, leaving the westerly right of way line of North Quarry Road and an easterly line of said Silva tract, and through said Silva tract, North 76°25'39" West for a distance of 50.97 feet to a point;

Thence, continuing through said Silva tract, North 77°57'46" West for a distance of 672.97 feet to the Point of Beginning;

Thence, from the Point of Beginning, continuing through said Silva tract, South 64°40'50" West for a distance of 53.26 feet to a point in a westerly line of said Silva tract and in an easterly line of a tract conveyed to the Ohio Edison Company in Volume 193, Page 281 and Volume 487, Page 325;

Thence, along a westerly line of said Silva tract and along an easterly line of said Ohio Edison Company tract, North 27°24'06" East for a distance of 33.52 feet to a point;

Thence, leaving a westerly line of said Silva tract and an easterly line of said Ohio Edison Company tract, and through said Silva tract, South 77°57'46" East for a distance of 33.46 feet to the Point of Beginning;

Containing 541 square feet, 0.0124 acres;

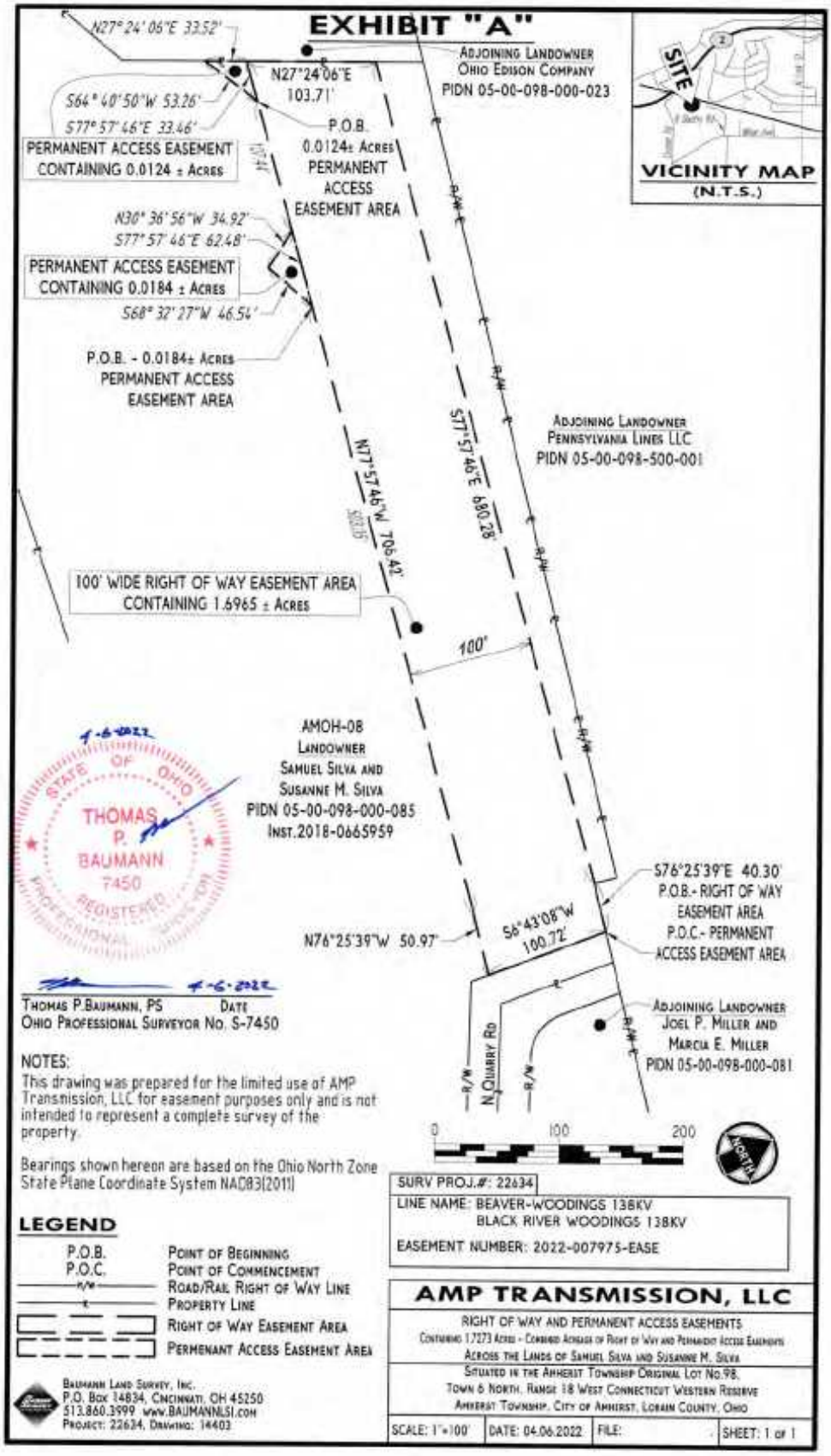
Subject to existing easements and rights of way;

Based on a survey performed by Baumann Land Survey, Inc.

Bearings based on the Ohio North Zone State Plane Coordinate System NAD83(2011)

Deed Reference: Instrument No.2018-0665959

Prepared by: Baumann Land Survey, Inc., Thomas P. Baumann, PS, Ohio Surveyor #: S-7450



THOMAS P. BAUMANN, PS — DATE
OHIO PROFESSIONAL SURVEYOR NO. S-7450

NOTES:
This drawing was prepared for the limited use of AMP Transmission, LLC for easement purposes only and is not intended to represent a complete survey of the property.

Bearings shown hereon are based on the Ohio North Zone State Plane Coordinate System NAD83(2011)

LEGEND

P.O.B.	POINT OF BEGINNING
P.O.C.	POINT OF COMMENCEMENT
R/W	ROAD/RAIL RIGHT OF WAY LINE
℄	PROPERTY LINE
	RIGHT OF WAY EASEMENT AREA
	PERMENANT ACCESS EASEMENT AREA

BAUMANN LAND SURVEY, INC.
P.O. BOX 14834, CINCINNATI, OH 45250
513.860.3599 WWW.BAUMANNLSI.COM
PROJECT: 22634, DRAWING: 14403

SURV PROJ.#: 22634

LINE NAME: BEAVER-WOODINGS 138KV
BLACK RIVER WOODINGS 138KV

EASEMENT NUMBER: 2022-007975-EASE

AMP TRANSMISSION, LLC

RIGHT OF WAY AND PERMANENT ACCESS EASEMENTS
CONTAINING 1.7273 ACRES - COMBINED ACREAGE OF RIGHT OF WAY AND PERMANENT ACCESS EASEMENTS
ACROSS THE LANDS OF SAMUEL SILVA AND SUSANNE M. SILVA
SITUATED IN THE AMHERST TOWNSHIP ORIGINAL LOT NO.98,
TOWN 6 NORTH, RANGE 18 WEST CONNECTICUT WESTERN RESERVE
AMHERST TOWNSHIP, CITY OF AMHERST, LORAIN COUNTY, OHIO

SCALE: 1"=100'	DATE: 04.06.2022	FILE:	SHEET: 1 OF 1