Photo 7: Viewing across the northwest portion of the property.

Photo 8: Viewing at the parcel that extends to S. Three B's and K Road on the west central side of the property.

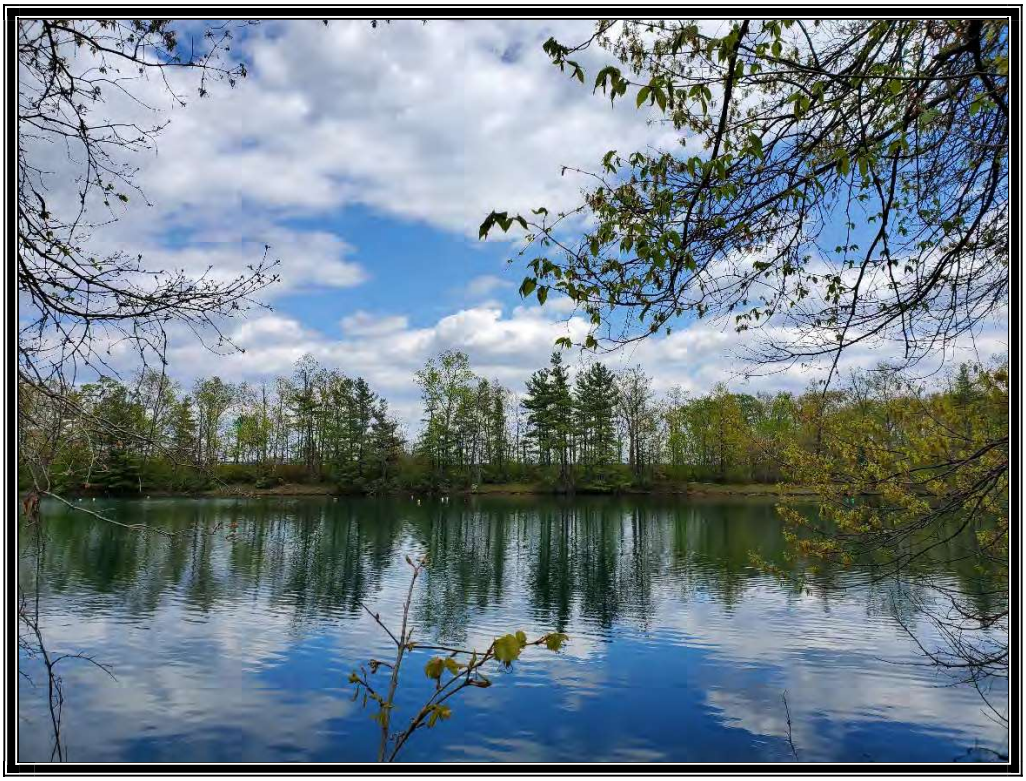


Photo 9: Viewing at the pond on the east adjoining property.

Photo 10: Viewing at the single-family house on the south adjoining property.

Photo 11: Viewing at S. Three B's and K Road bordering the southwest side of the property.

Photo 12: Viewing at K-O-K Products Inc. on the southwest adjoining property.

Photo 13: Viewing at the single-family houses on the west central adjoining properties.

GEOTECHNICAL
CONSULTANTS INC.

MAIN OFFICE
720 Greencrest Drive
Westerville, OH 43081
614.895.1400 **phone**
614.895.1171 **fax**

YOUNGSTOWN OFFICE
8433 South Avenue
Building 1, Suite 1
Boardman, OH 44514
330.965.1400 **phone**
330.965.1410 **fax**

DAYTON OFFICE
2380 Bellbrook Avenue
Xenia, OH 45385
937.736.2053 **phone**

www.gci2000.com

GEOTECHNICAL CONSULTANTS INC.

GCI PROJECT No. 20-G-24100

Subsurface Exploration and Geotechnical Engineering Report

60-Acre Multi-Family Residential Development
3B's & K Road
Delaware County, Ohio

Prepared for:
Wallick-Hendy Development Company, LLC

June 8, 2020

MAIN OFFICE
720 Greencrest Drive
Westerville, OH 43081
614.895.1400 **phone**
614.895.1171 **fax**

YOUNGSTOWN OFFICE
8433 South Avenue
Building 1, Suite 1
Boardman, OH 44514
330.965.1400 **phone**
330.965.1410 **fax**

DAYTON OFFICE
2380 Bellbrook Avenue
Xenia, OH 45385
937.736.2053 **phone**

GEOTECHNICAL CONSULTANTS INC.

www.gci2000.com

June 8, 2020

Mr. Timothy Swiney
Senior Vice President
Wallick-Hendy Development Company, LLC
160 West Main Street, Suite 200
New Albany, Ohio 43054

Reference: Subsurface Exploration and Geotechnical Engineering Report
60-Acre Multi-Family Residential Development
3B's & K Road – Delaware County, Ohio
GCI Project No. 20-G-24100

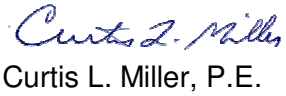
Dear Mr. Swiney:

As you authorized, Geotechnical Consultants, Inc. (GCI) performed a subsurface exploration and prepared a geotechnical engineering report for the above referenced project. In summary, our borings encountered a surface topsoil (0.5 to 0.7 feet), underlain by natural lean clay (including glacial till), granular soils, and shale bedrock (9 feet or deeper). We encountered groundwater seepage in 3 borings at depths of 11 to 13 feet below grade.

The primary geotechnical issues that will impact site development are proper site stripping, subgrade stability, new fill placement and compaction (as needed), and proper installation of foundations, slabs, and pavements. Provided these issues are properly addressed, it is GCI's opinion that this site is suitable for support of typical light multi-family residential development using conventional shallow foundations, concrete slab-on-grade, and flexible pavements. We discuss geotechnical considerations and provide foundation recommendations in more detail within the report.

After you have reviewed the report, feel free to contact us with any questions you may have. We appreciate the opportunity to provide our services for this project and hope to continue providing our services through construction.

Respectfully submitted,
Geotechnical Consultants, Inc.



Curtis L. Miller, P.E.
Principal

Kevin M. O'Connor, P.E., PhD
In-House Reviewer

Distribution: Mr. Tim Swiney @ Wallick-Hendy – pdf email
GCI File – 1 copy

TABLE OF CONTENTS

INTRODUCTION

As authorized by Mr. Timothy Swiney on behalf of Wallick-Hendy Development Company, LLC (Wallick), Geotechnical Consultants, Inc. (GCI) performed a subsurface exploration and prepared this geotechnical engineering report for the anticipated multi-family residential development to be located on 3B's & K Road in Delaware County, Ohio. A development plan was not available, but we were provided with a plan showing the property boundary.

Our subsurface study consisted of ten (10) standard penetration borings drilled across the proposed development area. We attach the test boring logs and a plan showing the approximate boring locations in the appendix.

The intent of this study was to evaluate subsurface conditions and offer geotechnical recommendations relative to site preparation, earthwork, foundations, slabs, and pavements for the proposed development. We issue this report prior to the receipt of site development and grading plans. **GCI should review these plans when available, and provide additional borings and recommendations, if necessary.**

We prepared this report for the exclusive use of Wallick-Hendy Development Company, LLC and their consultants for specific application to the above referenced project in Delaware County, Ohio in accordance with generally accepted soil and foundation engineering practices. We make no warranty, expressed or implied.

SITE AND PROJECT DESCRIPTIONS

The project site is an irregular-shaped piece of land, totaling about 60 acres in size. The property is located east of 3 B's & K Road, south of Route 36 in Delaware County, Ohio. We show the general site location on an attached map (DeLorme Street Atlas USA® 2014).

At the time of drilling, the property was mostly an open field, with some tree lines. The aerial photograph below shows the site as it looked at the time of drilling.

Aerial Photograph of Site (Google.com Maps)

A development plan was not available, but we anticipate 1- to 3-story, slab-on-grade multi-family residential structures, and associated pavements and utilities.

SUBSURFACE CONDITIONS

GCI mobilized a rotary drill rig (with automatic sampling hammer) to the site on May 27 and 28, 2020. We drilled ten standard penetration borings (B-1 to B-10) across the property. The borings terminated at depths ranging from 18.5 feet to 28.6 feet below grade.

We have attached boring logs and the boring location plan to the appendix of this report. We summarize our subsurface findings in the attached table and in the discussion below. Refer to individual boring logs for more detailed subsurface information at specific boring locations.

Surface Cover

The borings encountered surface topsoil ranging in thickness from 0.4 to 0.7 feet. The average topsoil thickness at boring locations across the site was 0.6 feet.

Natural Soils

Below the surface cover, the borings encountered moderately plastic, brown mottled gray lean clay to lean clay with sand (classified as CL under the Unified Soil Classification System). Standard penetration testing indicated the lean clay was medium stiff to stiff in cohesive consistency. The lean clay extended to depths ranging from 2 to 5 feet below existing grade.

Below the mottled lean clay, we encountered moderately plastic, brown glacial till, which was visually classified as lean clay with sand (CL). The till changed color to gray in borings B-1 to B-4, B-6, and B-10 at depths of 7 feet to 16.5 feet below existing grade.

The gray till was classified as sandy lean clay with gravel (CL). In general, the gray till contained more sand and gravel and was less plastic when compared to the brown till. We noted occasional silty sand and gravel layers within the till soils. We noted thicker granular layers in borings B-1 (8' to 12.5') and B-2 (7.5' to 10'). Standard penetration testing indicated the till soils were stiff to very stiff in cohesive consistency. We terminated borings B-1 and B-10 in the gray till soils at 20 feet below grade.

Bedrock

We encountered gray to black weathered to intact shale bedrock in borings B-2 to B-9 at depths of 9 to 23 feet below grade. The shale became intact with depth, as evidenced by recording 50 blows of the sampling hammer resulting in less than 6 inches of split spoon sampler movement. We terminated these borings in the shale at depths of 18.5 feet to 28.6 feet below grade.

Groundwater and Soil Moisture Conditions

We encountered groundwater seepage in borings B-1, B-6, and B-10 at respective depths of 12, 13, and 11 feet below grade. GCI noted that the split-barrel soil samples obtained during the drilling process were generally moist, with an occasional very moist sample noted. The shale was generally damp. Note that soil moisture conditions and groundwater observations fluctuate in response to precipitation events, seasonal changes, stabilization time, and other factors that may differ from the time of our measurements.

ANALYSES AND CONCLUSIONS

GEOTECHNICAL EVALUATION

It is GCI's opinion that with proper preparation procedures, the site is generally suitable for the anticipated typical multi-family residential development using conventional shallow spread footings, continuous wall foundations, and concrete slabs-on-grade. Standard flexible pavement sections can also be used for the development provided the soil subgrades are firm and stable prior to proceeding with pavement construction. We discuss geotechnical considerations in the following paragraphs.

Site Stripping

We recommend any surface organics, including topsoil, vegetation, stumps from removed trees, etc., be completely removed to expose stable existing natural soils prior to placing new fill, underslab aggregate, or pavement base aggregate. Stripping should extend to a minimum of 5 feet laterally beyond proposed building and pavement areas. Topsoil and organic matter can be stockpiled for reuse in landscaping mounds, redistributed in proposed green space areas, or disposed at an off-site location.

Subgrade Stability

The earthwork contractor should proof-roll the exposed, soil subgrade using a fully-loaded, tandem-axle dump truck (or equivalent) to identify potential soft, yielding subgrade areas. Soft spots identified during the proof-roll should be undercut to firm, stable conditions or otherwise stabilized prior to placing additional fill, slab construction, or paving. Structural fill can be placed to design grade provided the exposed subgrades are proof-rolled, and firm, stable conditions are verified prior to fill placement.

Stabilization of soft subgrades by disking, aerating/drying, and re-compaction may be feasible during traditionally drier times of the year. During wet seasons, partial undercutting and replacing of wet soils with structural fill, drying with soil additives such as lime, or use of geosynthetics may be needed to create a stable subgrade before placing controlled fills. The use of soil additives such as lime and flyash or installation of geosynthetics should be reviewed by our office prior to use in the field. We advise careful routing of construction traffic to help minimize instabilities of near-surface soils during wet seasons.

The severity of soft, very moist subgrade conditions will depend on the time of year earthwork is performed, and the amount of moisture within the subgrade soils. We expect fewer problems with soft and wet subgrades if earthwork and mass grading operations are performed during traditionally drier times of the year (i.e. late spring, summer, and early fall). Traditional wetter seasons (i.e. late fall, winter, and early spring) will contribute to problems associated with soft, very moist subgrades.

Shale Considerations

We encountered shale bedrock at depths of 9 feet or deeper in many of the borings. We do not anticipate general grading or foundation excavations will encounter shale. Some deeper utility excavations may encounter shale. Generally, if we can auger into the shale, a large hydraulic excavator can penetrate the material with some difficulty. The more intact portions of the shale may prove more difficult and could require more advanced removal techniques. We do not recommend using shale as structural fill for the project due to the potential for volume change with changes in water content.

New Fill Placement and Compaction

Structural fill can be placed to design grade once the subgrades are brought to firm and stable conditions. Non-organic, clay-based site soils are suitable for reuse in new, controlled fills provided proper moisture control is maintained. Depending on the time of year of earthwork, the fill materials may require drying to achieve compaction. Fill materials within building pads and pavement areas should be placed in a controlled manner as described in the *Site Preparation and Earthwork* section of this report.

FOUNDATIONS

Footings can bear on stable non-organic natural soils, or on new, controlled fill placed directly over existing stable natural soils. Foundations bearing on acceptable soils can be designed using a maximum allowable bearing capacity not to exceed 3,000 pounds per square foot.

Regardless of calculated sizes, GCI recommends minimum footing sizes of 30 inches square for columns and 16 inches in width for strip footings to eliminate a potential punching effect. All exterior footings should extend to a minimum of 36 inches (frost code depth) or to acceptable soils, whichever is deeper. Interior footings in heated areas may be placed as shallow as feasible as long as they are bearing on acceptable soils.

If soft or unstable areas are encountered within footing excavations, undercut to stable soils. Undercut areas can be backfilled to bottom of footing elevation using a controlled density fill (CDF). Alternatively, the foundations can be constructed on firm, stable natural soils at the bottom of the undercut. **GCI should be retained to observe soft or unstable bearing soils prior to undercuts.**

FLOOR SLABS

Once the building pads have been prepared, conventional concrete slab-on-grade is feasible for the anticipated construction. Subgrades should be thoroughly proof-rolled and any soft, yielding areas brought to a stable condition prior to slab construction or placement of aggregate base. GCI recommends placing a minimum of 4 inches of granular fill (well-graded crushed stone, such as AASHTO #57 Stone or ODOT Item 304) under the floor slabs to serve as a capillary cut-off, and to provide a uniform, firm subbase. The aggregate thickness should be increased to 6 inches in more heavily loaded areas. We recommend placing a vapor retarder below the slab where moisture may be a problem with slab-on-grade floor coverings.

BELOW-GRADE WALLS

Retaining walls allowed to move freely at the top of the wall should be designed using active lateral earth pressure. Walls restrained at both top and bottom should be designed to resist an at-rest lateral soil pressure. The design loading depends on the type of backfill material used and boundary support conditions. The following table provides recommended equivalent fluid pressures for two types of soils and loading conditions.

Soil Type	Equivalent Active Fluid Pressure (pcf)	Equivalent At-Rest Fluid Pressure (pcf)
Lean Clay (site soils)	**55**	**70**
Sand and Gravel (properly compacted)	**35**	**55**

We do not recommend using cohesive soils as wall backfill due to their poor drainage characteristics and potential for lateral wall loads resulting from surface frost. We recommend that granular material (less than 15% passing the No. 200 sieve) be used for all

wall backfill. The stone should be placed in a wedge defined by a line extending up from the footing at a 35° angle from the vertical to allow use of the lower values above. We recommend that footing drains and underslab drains leading to a permanent sump pump be installed to minimize the build-up of hydrostatic forces behind the below-grade walls. GCI also suggests damp-proofing of below-grade walls.

SEISMIC FACTOR

The borings at the site revealed a subsurface profile consisting of stiff to very stiff natural lean clay and glacial till, underlain by shale bedrock. In accordance with the Ohio Building Code, we classify the site as a Site Class C – very stiff still/soft rock profile.

EXCAVATIONS

The existing natural site soils can be excavated with conventional track hoe equipment. We encountered shale bedrock, with top of rock at depths ranging from 9 to 23 feet below grade. We do not anticipate mass grading or shallow foundation or utility excavations will encounter shale, unless significant cuts are made. Deeper utility excavations may encounter shale. In our experience, if we can auger into the material with our drill rig, a large hydraulic excavator can typically excavate the material with some difficulty. If more intact shale is encountered, other methods of removal may be needed. Excavations that extend into or through granular layers may require laybacks. **All site excavations should comply with current OSHA regulations**.

GROUNDWATER

We encountered groundwater seepage in three borings at depths greater than 10 feet below grade. We do not anticipate that groundwater will pose significant problems with

shallow foundation and shallow utility trench excavations associated with the proposed development. If water is encountered in site excavations, the excavations should be dewatered to allow footing construction and utility trench backfilling in dry conditions. We expect groundwater seepage flows in excavations can be handled with portable sump pumps and working mats of crushed stone, as needed. Contact GCI for additional recommendations if excessive groundwater conditions are encountered.

PAVEMENTS

Provided the site is properly prepared, conventional aggregate base and flexible asphalt wearing course pavements can be used. Prior to pavement construction, the subgrade should be carefully proof-rolled, and stabilized as necessary to provide a CBR value of at least 3. A specific pavement design is beyond the scope of work of this report; GCI can provide one if requested. A site-specific pavement design would require additional laboratory testing and pavement use criteria.

Properly compacted, GCI anticipates the site soils would have a CBR value of at least 3. Based on the soils encountered, and assuming properly prepared subgrades, GCI recommends a minimum light-duty pavement section consisting of 3 inches of asphalt over 8 inches of aggregate base. For heavy-duty traffic areas, including the main traffic aisles and areas subjected to refuse truck traffic, GCI suggests a pavement section consisting of a minimum of 4 inches of asphalt over 10 inches of aggregate base. GCI recommends a minimum of 8 inches of air-entrained, Portland cement concrete for any dumpster pad(s) and dumpster pad approach area(s).

Providing adequate subbase drainage is important to future pavement performance. Finger drains connecting to weep-holes in inlets, proper grading of pavement subgrades and surfaces to shed run-off, and underdrains in pavement swales are suggested subbase drainage methods and should be designed by the site civil engineer. Installing a medium-duty geogrid (Tensar BX 1100, or equivalent) below the base aggregate course in areas subjected to stopping and turning traffic or concentrated traffic flow, such as the main entrance/exit drives, will increase the structural number of the pavement section and improve the pavement performance.

SITE PREPARATION AND EARTHWORK

As a general approach to the site preparation, we recommend the following:

1. Strip existing vegetation, topsoil, stumps from removed trees, and root mat systems from beneath proposed construction areas plus 5 feet laterally beyond. Topsoil can be stockpiled for later distribution in site landscaping mounds, green space areas, or used to fill borrow pits.

2. Carefully proof-roll the soil subgrades using a fully-loaded, tandem-axle dump truck (or equivalent) to identify potential soft, yielding subgrade areas. Soft/unstable areas identified during the proof-roll should be undercut to stable subgrade conditions or otherwise stabilized prior to placing controlled fill, placing underslab aggregate, or placing pavement subbase materials.

3. Place controlled fill to design grade within the proposed construction areas, as required. The non-organic site soils are suitable for reuse in controlled fills. **Do not use shale as structural fill.** Off-site borrow materials should be reviewed by our office prior to use.

4. Place controlled fills in maximum 8-inch thick loose lifts and compact to a minimum of 98% of the maximum Standard Proctor dry density (ASTM D-698). The moisture in the site soils should be controlled to within ±3% of the optimum Standard Proctor moisture content. **Depending on the time of year of earthwork, moisture adjustment of the site soils may be required to achieve proper compaction.** Cohesive soils will compact best with a static-weight sheepsfoot roller. Clay-based soils that are over the optimum moisture content will tend to pump if exposed to vibratory sheepsfoot compaction equipment.

5. Excavate for foundations after fill placement for the building pads is complete. Footings may bear on suitable soils as recommended in the report. Undercut any isolated soft zones to achieve firm bearing conditions. Refer to the *Geotechnical*

Evaluation and *Foundations* section of this report for specific foundation design parameters.

6. Pavement areas should be steel-wheel rolled to a smooth surface prior to placement of base aggregate. Subgrade preparation during wet seasons may require the use of engineering fabric or geogrid.

7. We recommend that GCI be retained to observe proof-rolling operations, cut and fill operations, and footing excavations.

8. If work is performed during the winter (e.g., when freezing temperatures occur), special protective measures will be required during fill placement and footing construction procedures. Contact GCI for additional cold weather recommendations, as needed.

CONSTRUCTION MATERIALS ENGINEERING AND TESTING

GCI provides construction materials engineering and testing services. For project continuity throughout construction, we recommend that GCI be retained to observe, test, and document:

- earthwork procedures (stripping, fill placement, compaction, utility trench backfill, etc.),
- slab preparation (proof-rolling, excavations, undercuts, etc.),
- concrete placement and compressive strength testing (footings, slabs, pavements, etc.), and
- structural steel (welds, bolts, etc.).

The purpose of this work is to assess that the intent of our recommendations is being followed and to make timely changes to our recommendations (as needed) in the event site conditions vary from those encountered in our borings. Please contact our field department to initiate these services.

FINAL

We recommend that GCI review final site layout and grading plans. Recommendations contained in this report may be changed based on review of final site plans. If any changes in the nature, design or locations of the construction are planned, conclusions

and recommendations should not be considered valid unless verified in writing by GCI. The recommendations contained in this report are the opinion of GCI based on the subsurface conditions found in the borings and available development information.

This report has been prepared for design purposes only and should not be considered sufficient to prepare an accurate bid document. It should be noted that the nature and extent of variations between borings might not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

If you have any questions or need for any additional information, please contact our office. It has been a pleasure to be of service to you on this project, and we hope to continue our services through construction.

GEOTECHNICAL
CONSULTANTS INC.

APPENDIX – 60-Acre Multi-Family Residential Development

General Notes for Soil Sampling and Classifications
General Site Location Map (DeLorme Street Atlas USA ® 2014)
Boring Location Plan
Summary of Encountered Subsurface Conditions
Test Boring Logs (B-1 to B-10)

GEOTECHNICAL CONSULTANTS INC.

MAIN OFFICE
720 Greencrest Drive
Westerville, OH 43081
614.895.1400 **phone**
614.895.1171 **fax**

YOUNGSTOWN OFFICE
8433 South Avenue
Building 1, Suite 1
Boardman, OH 44514
330.965.1400 **phone**
330.965.1410 **fax**

DAYTON OFFICE
2380 Bellbrook Avenue
Xenia, OH 45385
937.736.2053 **phone**

www.gci2000.com

GENERAL NOTES FOR SOIL SAMPLING AND CLASSIFICATIONS

BORINGS, SAMPLING AND GROUNDWATER OBSERVATIONS:

Drilling and sampling were conducted in accordance with procedures generally recognized and accepted as standard methods of exploration of subsurface conditions. The borings were drilled using a truck-mounted drill rig using auger boring methods with standard penetration testing performed in each boring at intervals ranging from 1.5 to 5.0 feet. The stratification lines on the logs represent the approximate boundary between soil types at that specific location and the transition may be gradual.

Water levels were measured at drill locations under conditions stated on the logs. This data has been reviewed and interpretations made in the text of the report. Fluctuations in the level of the groundwater may occur due to other factors than those present at the time the measurements were made.

The Standard Penetration Test (ASTM-D-1586) is performed by driving a 2.0 inch O.D. split barrel sampler a distance of 18 inches utilizing a 140 pound hammer free falling 30 inches. The number of blows required to drive the sampler each 6 inches of penetration are recorded. The summation of the blows required to drive the sampler for the final 12 inches of penetration is termed the Standard Penetration Resistance (N). Soil density/consistency in terms of the N-value is as follows:

COHESIONLESS DENSITY		COHESIVE CONSISTENCY	
0-10	Loose	0-4	Soft
10-30	Medium Dense	4-8	Medium Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	Very Stiff
		30 +	Hard

SOIL MOISTURE TERMS

Soil Samples obtained during the drilling process are visually characterized for moisture content as follows:

MOISTURE CONTENT	DESCRIPTION
Damp	Soil moisture is much drier than the Atterberg plastic limit (where soils are cohesive) and generally more than 3% below Standard Proctor “optimum” moisture conditions. Soils of this moisture generally require added moisture to achieve proper compaction.
Moist	Soil moisture is near the Atterberg plastic limit (cohesive soils) and generally within ±3% of the Standard Proctor “optimum” moisture content. Little to no moisture conditioning is anticipated to be required to achieve proper compaction and stable subgrades.
Very Moist	Soil moisture conditions are above the Atterberg plastic limit (cohesive soils) and generally greater than 3% above Standard Proctor “optimum” moisture conditions. Drying of the soils to near “optimum” conditions is anticipated to achieve proper compaction and stable subgrades.
Wet	Soils are saturated. Significant drying of soils is anticipated to achieve proper compaction and stable subgrades.

SOIL CLASSIFICATION PROCEDURE:

Soil samples obtained during the drilling process are preserved in plastic bags and visually classified in the laboratory. Select soil samples may be subjected to laboratory testing to determine natural moisture content, gradation, Atterberg limits and unit weight. Soil classifications on logs may be adjusted based on results of laboratory testing.

Soils are classified in accordance with the ASTM version of the Unified Soil Classification System. ASTM D-2487 “Classification of Soils for Engineering Purposes (Unified Soil Classification System) describes a system for classifying soils based on laboratory testing. ASTM D-2488 “Description and Identification of Soil (Visual-Manual Procedure) describes a system for classifying soils based on visual examination and manual tests.

Soil classifications are based on the following tables (see reverse side):

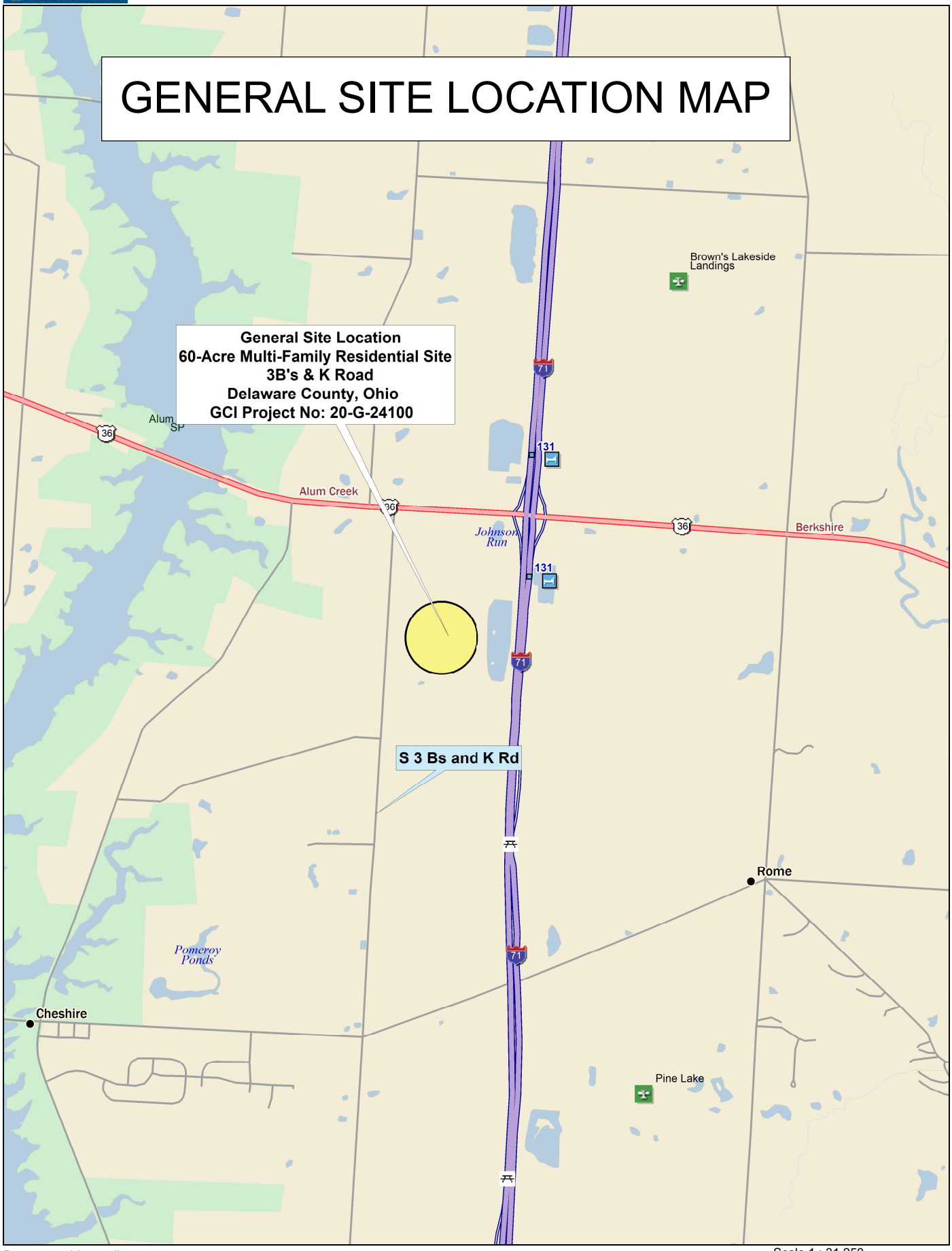
GENERAL NOTES FOR SOIL SAMPLING AND CLASSIFICATIONS

PARTICLE SIZE DEFINITION		
Boulders:		>12"
Cobbles:		3" to 12"
Gravel:	Coarse:	3/4" to 3"
	Fine:	No. 4 (3/16") to 3/4"
Sand:	Coarse	No. 10 (2.0mm) to No. 4 (4.75mm)
	Medium	No. 40 (0.425mm) to No. 10 (2.0mm)
	Fine	No. 200 (0.074mm) to No. 40 (0.425mm)
Silt & Clay		<0.074mm; classification based on overall plasticity; in general clay particles <0.005mm.

CONSTITUENT MODIFIERS	
Trace	Less than 5%
Few	5-10%
Little	15-25%
Some	30-45%
Mostly	50-100%

ASTM/UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART		
COARSE-GRAINED SOILS (more than 50% of materials is larger than No. 200 sieve size)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	*Clean Gravel (less than 5% fines)*	
	GW	Well-graded gravel, gravel-sand mixtures, little or no fines
	GP	Poorly-graded gravels, gravel sand mixtures, little or no fines
	Gravels with fines (more than 12% fines)	
	GM	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
SANDS More than 50% of coarse fraction smaller than No. 4 sieve size	*Clean Sands (Less than 5% fines)*	
	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly-graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	
	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures
Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 percent ……GW, GP, SW, SP Greater than 12 percent ……GM, GC, SM, SC 5 to 12 percent ……Borderline cases requiring dual symbols: SP-SM, GP-GM, etc.		
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size)		
SILTS AND CLAYS Liquid Limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays or low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	CL-ML	Inorganic silty clay of slight plasticity, P.I. between 4 and 7
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid Limit 50% or greater	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays or medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

GENERAL SITE LOCATION MAP



TN
MN (7.5°W)

Scale 1 : 31,250
1" = 2,604.2 ft
Data Zoom 12-6

Approximate Boring Location

BORING LOCATION PLAN

60-Acre Multi-Family Development
3B's & K Road – Delaware County, Ohio

Aerial Photo from Google.com	
Project No.: 20-G-24100	
Date: 6/3/2020	**Drawn By:** CLM
Scale: NTS	

Summary of Encountered Subsurface Conditions

60-Acre Multi-Family Development
3B's & K Road - Delaware County, Ohio
GCI Job Number: 20-G-24100

Borehole	Surface Layer	Topsoil Thickness (ft.)	Groundwater: Level Encountered (ft)	Groundwater: Level at Completion (ft)	Depth to Lean Clay (ft)	Depth to Brown Till (ft)	Depth to Gray Till (ft)	Depth to Silty Sand (ft)	Depth to Shale (ft)	Bottom of Boring Depth (ft)
			Depth	Depth						
B- 1	Topsoil	0.6	12	15	--	4.0	12.5	8.0	--	20.0
B- 2	Topsoil	0.6	--	--	--	4.0	10.0	7.5	17.0	28.6
B- 3	Topsoil	0.6	--	--	--	4.5	7.0	--	9.0	18.7
B- 4	Topsoil	0.6	--	--	--	3.0	16.0	--	23.0	28.6
B- 5	Topsoil	0.7	--	--	--	4.5	--	--	11.0	18.7
B- 6	Topsoil	0.5	13	--	--	4.0	9.5	--	11.0	28.5
B- 7	Topsoil	0.5	--	--	--	4.5	--	--	10.0	18.5
B- 8	Topsoil	0.4	--	--	--	2.0	--	--	12.0	28.5
B- 9	Topsoil	0.5	--	--	--	5.0	--	--	12.0	28.5
B-10	Topsoil	0.5	11	8	--	4.0	16.5	--	--	20.0

Average Topsoil Depth at boring locations: 0.6 feet

TEST BORING LOG

PROJECT NAME 60-Acre Multi-Family Development - 3B's & K Road - Delaware County, Ohio — BORING NO. B- 1

CLIENT Wallick-Hendy Development Company, LLC — PROJ. NO. 20-G-24100 — SURF. ELEV. _____ — DATE DRILLED 5/27/2020

GROUND WATER OBSERVATION

15.0 FEET BELOW SURFACE AT COMPLETION

_____ FEET BELOW SURFACE AT 24 HOURS

_____ FEET BELOW SURFACE AT ____ HOURS

Proportions Used

Trace	Less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Medium Dense	4 - 8	Medium Stiff
30 - 50	Dense	8 - 15	Stiff
50 +	Very Dense	15 - 30	Very Stiff
		30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Pocket Penetrometer (tsf)	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	4	0.0-1.5	SS	3	4	5	Moist	0.6	Topsoil
	4.5	2.0-3.5	SS	4	4	6	Moist	4.0	Brown Mottled Gray Lean Clay to Lean Clay with Sand (CL) - stained, moderately plastic, trace to little sand
5	4.5	4.0-5.5	SS	4	5	6	Moist	8.0	Brown Lean Clay with Sand (CL) - moderately plastic, little fine to coarse sand, trace gravel (glacial till); random silty sand and gravel layers noted
10	4	8.5-10.0	SS	7	7	8	Moist	12.5	Brown Silty Sand (SM) - little silt, little gravel; sandy silt layer noted Water Seepage at 12'
15	4.5	13.5-15.0	SS	8	10	11	Very Moist		Gray Sandy Lean Clay with Gravel (CL) - low plasticity, little to some fine to coarse sand, little gravel (glacial till); random silty sand and gravel layers noted
	4.5	18.5-20.0	SS	9	12	20	Moist	20.0	BOTTOM OF BORING: 20'

*** The stratification lines represent the approximate boundary between soil types and the transition may be gradual.**

TEST BORING LOG

PROJECT NAME 60-Acre Multi-Family Development - 3B's & K Road - Delaware County, Ohio — BORING NO. B- 2
PROJ. — SURF. ELEV.
CLIENT Wallick-Hendy Development Company, LLC — NO. 20-G-24100 — DATE DRILLED 5/27/2020

GROUND WATER OBSERVATION

None FEET BELOW SURFACE AT COMPLETION
_____ FEET BELOW SURFACE AT 24 HOURS
_____ FEET BELOW SURFACE AT ____ HOURS

Proportions Used

Trace	Less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Medium Dense	4 - 8	Medium Stiff
30 - 50	Dense	8 - 15	Stiff
50 +	Very Dense	15 - 30	Very Stiff
		30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Pocket Penetrometer (tsf)	Sample Depths From	To	Type of Sample	Blows per 6" on Sampler 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	3	0.0	1.5	SS	3	3	5	Moist	0.6	Topsoil
	4.5	2.0	3.5	SS	5	6	6	Moist	4.0	Brown Mottled Gray Lean Clay to Lean Clay with Sand (CL) - stained, moderately plastic, trace to little sand
5	4.5	4.0	5.5	SS	4	6	7	Moist	7.5	Brown Lean Clay with Sand (CL) - moderately plastic, little fine to coarse sand, trace gravel (glacial till); random silty sand and gravel layers noted
	4.5	8.5	10.0	SS	7	8	9	Moist	10.0	Brown Silty Sand (SM) - little silt, little gravel; sandy silt layer noted
10										
	NR	13.5	15.0	SS	10	12	15	Moist	17.0	Gray Sandy Lean Clay with Gravel (CL) - low plasticity, little to some fine to coarse sand, little gravel (glacial till); random silty sand and gravel layers noted
15										
	--	18.5	18.9	SS	50/5"			Damp		Gray Weathered to Intact Shale
20										
	--	23.5	23.6	SS	50/1"			Damp		
25										
	--	28.5	28.6	SS	50/1"			Damp	28.6	
30										BOTTOM OF BORING: 28.6'

*** The stratification lines represent the approximate boundary between soil types and the transition may be gradual.**

TEST BORING LOG

PROJECT NAME 60-Acre Multi-Family Development - 3B's & K Road - Delaware County, Ohio — BORING NO. B- 3

CLIENT Wallick-Hendy Development Company, LLC — PROJ. NO. 20-G-24100 — SURF. ELEV. _____ — DATE DRILLED 5/27/2020

GROUND WATER OBSERVATION

None FEET BELOW SURFACE AT COMPLETION

_____ FEET BELOW SURFACE AT 24 HOURS

_____ FEET BELOW SURFACE AT ____ HOURS

Proportions Used

Trace	Less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Medium Dense	4 - 8	Medium Stiff
30 - 50	Dense	8 - 15	Stiff
50 +	Very Dense	15 - 30	Very Stiff
		30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Pocket Penetrometer (tsf)	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	3	0.0-1.5	SS	4	3	4	Moist to Very Moist	0.6	Topsoil
	4.5	2.0-3.5	SS	4	4	4	Moist	4.5	Brown Mottled Gray Lean Clay to Lean Clay with Sand (CL) - stained, moderately plastic, trace to little sand
	4.5	4.0-5.5	SS	5	5	6	Moist	7.0	Brown Lean Clay with Sand (CL) - moderately plastic, little fine to coarse sand, trace gravel (glacial till); random silty sand and gravel layers noted
5	4	8.5-9.4	SS	12	50/5"		Moist	9.0	Gray Sandy Lean Clay with Gravel (CL) - low plasticity, little to some fine to coarse sand, little gravel (glacial till); random silty sand and gravel layers noted
10	--	13.5-13.8	SS	50/3"			Damp		Gray Weathered to Intact Shale
15	--	18.5-18.7	SS	50/2"			Damp	18.7	
									BOTTOM OF BORING: 18.7'

*** The stratification lines represent the approximate boundary between soil types and the transition may be gradual.**

720 Greencrest Drive • Westerville, Ohio 43081 • 614-895-1400

TEST BORING LOG

PROJECT NAME 60-Acre Multi-Family Development - 3B's & K Road - Delaware County, Ohio
BORING NO. B- 4
PROJ. NO. 20-G-24100
SURF. ELEV.
CLIENT Wallick-Hendy Development Company, LLC
DATE DRILLED 5/28/2020

GROUND WATER OBSERVATION

None FEET BELOW SURFACE AT COMPLETION
_____ FEET BELOW SURFACE AT 24 HOURS
_____ FEET BELOW SURFACE AT ____ HOURS

Proportions Used

Trace	Less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Medium Dense	4 - 8	Medium Stiff
30 - 50	Dense	8 - 15	Stiff
50 +	Very Dense	15 - 30	Very Stiff
		30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Pocket Penetrometer (tsf)	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	3	0.0-1.5	SS	3	4	3	Moist	0.6	Topsoil
	4.5	2.0-3.5	SS	4	5	5	Moist	3.0	Brown Mottled Gray Lean Clay to Lean Clay with Sand (CL) - stained, moderately plastic, trace to little sand
5	4.5	4.0-5.5	SS	3	4	5	Moist		Brown Lean Clay with Sand (CL) - moderately plastic, little fine to coarse sand, trace gravel (glacial till); random silty sand and gravel layers noted
	4	8.5-10.0	SS	6	6	5	Moist		
10									
	4.5	13.5-15.0	SS	9	18	21	Moist		
15								16.0	
	4.5	18.5-20.0	SS	10	13	20	Moist		Gray Sandy Lean Clay with Gravel (CL) - low plasticity, little to some fine to coarse sand, little gravel (glacial till); random silty sand and gravel layers noted
20								23.0	
	--	23.5-23.7	SS	50/2"			Damp		Gray Weathered to Intact Shale
25									
	--	28.5-28.6	SS	50/1"			Damp	28.6	
30									BOTTOM OF BORING: 28.6'

*** The stratification lines represent the approximate boundary between soil types and the transition may be gradual.**

720 Greencrest Drive • Westerville, Ohio 43081 • 614-895-1400

TEST BORING LOG

PROJECT NAME 60-Acre Multi-Family Development - 3B's & K Road - Delaware County, Ohio — BORING NO. B- 5

PROJ. NO. 20-G-24100 — SURF. ELEV. _____

CLIENT Wallick-Hendy Development Company, LLC — DATE DRILLED 5/27/2020

GROUND WATER OBSERVATION

None FEET BELOW SURFACE AT COMPLETION

_____ FEET BELOW SURFACE AT 24 HOURS

_____ FEET BELOW SURFACE AT _____ HOURS

Proportions Used

Trace	Less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Medium Dense	4 - 8	Medium Stiff
30 - 50	Dense	8 - 15	Stiff
50 +	Very Dense	15 - 30	Very Stiff
		30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Pocket Penetrometer (tsf)	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	--	0.0-1.5	SS	3	5	5	Moist	0.7	Topsoil
	4.5	2.0-3.5	SS	4	5	7	Moist	4.5	Brown Mottled Gray Lean Clay to Lean Clay with Sand (CL) - stained, moderately plastic, trace to little sand
	4.5	4.0-5.5	SS	3	5	5	Moist		
5								11.0	Brown Lean Clay with Sand (CL) - moderately plastic, little fine to coarse sand, trace gravel (glacial till); random silty sand and gravel layers noted
	4	8.5-10.0	SS	7	8	10	Moist		
10									
	--	13.5-13.9	SS	50/5"			Damp		
15									
	--	18.5-18.7	SS	50/2"			Damp	18.7	Gray Weathered to Intact Shale
									BOTTOM OF BORING: 18.7'

*** The stratification lines represent the approximate boundary between soil types and the transition may be gradual.**

720 Greencrest Drive • Westerville, Ohio 43081 • 614-895-1400

TEST BORING LOG

PROJECT NAME 60-Acre Multi-Family Development - 3B's & K Road - Delaware County, Ohio
BORING NO. B- 6
PROJ. NO. 20-G-24100
SURF. ELEV.
CLIENT Wallick-Hendy Development Company, LLC
DATE DRILLED 5/27/2020

GROUND WATER OBSERVATION

None FEET BELOW SURFACE AT COMPLETION
_____ FEET BELOW SURFACE AT 24 HOURS
_____ FEET BELOW SURFACE AT ____ HOURS

Proportions Used

Trace	Less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Medium Dense	4 - 8	Medium Stiff
30 - 50	Dense	8 - 15	Stiff
50 +	Very Dense	15 - 30	Very Stiff
		30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Pocket Penetrometer (tsf)	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	4	0.0-1.5	SS	3	3	4	Moist	0.5	Topsoil
	4	2.0-3.5	SS	3	4	4	Moist	4.0	Brown Mottled Gray Lean Clay to Lean Clay with Sand (CL) - stained, moderately plastic, trace to little sand
5	4.5	4.0-5.5	SS	4	5	7	Moist	9.5	Brown Lean Clay with Sand (CL) - moderately plastic, little fine to coarse sand, trace gravel (glacial till); random silty sand and gravel layers noted
	3.5	8.5-10.0	SS	6	8	9	Moist	11.0	Gray Sandy Lean Clay with Gravel (CL) - low plasticity, little to some fine to coarse sand, little gravel (glacial till); random silty sand and gravel layers noted
10									Gray Weathered to Intact Shale
	--	13.5-13.9	SS	50/5"			Damp		Water Seepage at 13'
15									
	--	18.5-18.7	SS	50/2"			Damp		
20									
	--	23.5-23.6	SS	50/1"			Damp		
25									
		28.5	SS	50/0"				28.5	BOTTOM OF BORING: 28.5'
30									

*** The stratification lines represent the approximate boundary between soil types and the transition may be gradual.**

720 Greencrest Drive • Westerville, Ohio 43081 • 614-895-1400

TEST BORING LOG

PROJECT NAME 60-Acre Multi-Family Development - 3B's & K Road - Delaware County, Ohio
BORING NO. B- 7
PROJ. NO. 20-G-24100
SURF. ELEV.
CLIENT Wallick-Hendy Development Company, LLC
DATE DRILLED 5/28/2020

GROUND WATER OBSERVATION

None FEET BELOW SURFACE AT COMPLETION
____ FEET BELOW SURFACE AT 24 HOURS
____ FEET BELOW SURFACE AT ____ HOURS

Proportions Used

Trace	Less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Medium Dense	4 - 8	Medium Stiff
30 - 50	Dense	8 - 15	Stiff
50 +	Very Dense	15 - 30	Very Stiff
		30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Pocket Penetrometer (tsf)	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	4	0.0-1.5	SS	3	3	3	Moist	0.5	Topsoil
									Brown Mottled Gray Lean Clay to Lean Clay with Sand (CL) - stained, moderately plastic, trace to little sand
	4	2.0-3.5	SS	4	4	5	Moist		
	4	4.0-5.5	SS	3	4	6	Moist	4.5	
5									Brown Lean Clay with Sand (CL) - moderately plastic, little fine to coarse sand, trace gravel (glacial till); random silty sand and gravel layers noted
	4.5	8.5-10.0	SS	6	7	10	Moist		
10								10.0	
									Gray to Black Weathered to Intact Shale
	--	13.5-13.6	SS	50/1"			Damp		
15									
		18.5	SS	50/0"			Damp	18.5	
									BOTTOM OF BORING: 18.5'

*** The stratification lines represent the approximate boundary between soil types and the transition may be gradual.**

720 Greencrest Drive • Westerville, Ohio 43081 • 614-895-1400

TEST BORING LOG

PROJECT NAME 60-Acre Multi-Family Development - 3B's & K Road - Delaware County, Ohio — BORING NO. B- 8

CLIENT Wallick-Hendy Development Company, LLC — PROJ. NO. 20-G-24100 — SURF. ELEV. _____ — DATE DRILLED 5/28/2020

GROUND WATER OBSERVATION

None FEET BELOW SURFACE AT COMPLETION

_____ FEET BELOW SURFACE AT 24 HOURS

_____ FEET BELOW SURFACE AT _____ HOURS

Proportions Used

Trace	Less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Medium Dense	4 - 8	Medium Stiff
30 - 50	Dense	8 - 15	Stiff
50 +	Very Dense	15 - 30	Very Stiff
		30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Pocket Penetrometer (tsf)	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	4	0.0-1.5	SS	3	3	3	Moist	0.4	Topsoil
								2.0	Brown Mottled Gray Lean Clay to Lean Clay with Sand (CL) - stained, moderately plastic, trace to little sand
	4.5	2.0-3.5	SS	4	5	5	Moist		Brown Lean Clay with Sand (CL) - moderately plastic, little fine to coarse sand, trace gravel (glacial till); random silty sand and gravel layers noted
5	4.5	4.0-5.5	SS	3	4	5	Moist		
	4.5	8.5-10.0	SS	6	8	9	Moist		
10								12.0	
	--	13.5-13.9	SS	50/5"			Damp		Gray Weathered to Intact Shale
15									
	--	18.5-18.6	SS	50/1"			Damp		
20									
	--	23.5-23.7	SS	50/2"			Damp		
25									
		28.5	SS	50/0"				28.5	BOTTOM OF BORING: 28.5'
30									

*** The stratification lines represent the approximate boundary between soil types and the transition may be gradual.**

720 Greencrest Drive • Westerville, Ohio 43081 • 614-895-1400

TEST BORING LOG

PROJECT NAME 60-Acre Multi-Family Development - 3B's & K Road - Delaware County, Ohio — BORING NO. B- 9
PROJ. — SURF. ELEV.
CLIENT Wallick-Hendy Development Company, LLC — NO. 20-G-24100 — DATE DRILLED 5/28/2020

GROUND WATER OBSERVATION

None FEET BELOW SURFACE AT COMPLETION
_____ FEET BELOW SURFACE AT 24 HOURS
_____ FEET BELOW SURFACE AT ____ HOURS

Proportions Used

Trace	Less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density

0 - 10	Loose
10 - 30	Medium Dense
30 - 50	Dense
50 +	Very Dense

Cohesive Consistency

0 - 4	Soft
4 - 8	Medium Stiff
8 - 15	Stiff
15 - 30	Very Stiff
30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Pocket Penetrometer (tsf)	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	4	0.0-1.5	SS	3	3	4	Moist	0.5	Topsoil
	4.5	2.0-3.5	SS	4	5	5	Moist		Brown Mottled Gray Lean Clay to Lean Clay with Sand (CL) - stained, moderately plastic, trace to little sand
	4.5	4.0-5.5	SS	5	6	5	Moist	5.0	
5									Brown Lean Clay with Sand (CL) - moderately plastic, little fine to coarse sand, trace gravel (glacial till); random silty sand and gravel layers noted
	4	8.5-10.0	SS	7	7	7	Moist		
10								12.0	
	--	13.5-14.3	SS	27	50/3"		Damp		Gray Weathered to Intact Shale
15									
	--	18.5-18.9	SS	50/5"			Damp		
20									
	--	23.5-23.6	SS	50/1"			Damp		
25									
		28.5	SS	50/0"				28.5	
30									BOTTOM OF BORING: 28.5'

* **The stratification lines represent the approximate boundary between soil types and the transition may be gradual.**

720 Greencrest Drive • Westerville, Ohio 43081 • 614-895-1400

TEST BORING LOG

PROJECT NAME 60-Acre Multi-Family Development - 3B's & K Road - Delaware County, Ohio — BORING NO. B-10

CLIENT Wallick-Hendy Development Company, LLC — PROJ. NO. 20-G-24100 — SURF. ELEV. — DATE DRILLED 5/28/2020

GROUND WATER OBSERVATION

8.0 FEET BELOW SURFACE AT COMPLETION

_____ FEET BELOW SURFACE AT 24 HOURS

_____ FEET BELOW SURFACE AT _____ HOURS

Proportions Used

Trace	Less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density

0 - 10	Loose
10 - 30	Medium Dense
30 - 50	Dense
50 +	Very Dense

Cohesive Consistency

0 - 4	Soft
4 - 8	Medium Stiff
8 - 15	Stiff
15 - 30	Very Stiff
30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Pocket Penetrometer (tsf)	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	4	0.0-1.5	SS	3	3	4	Moist	0.5	Topsoil
									Brown Mottled Gray Lean Clay to Lean Clay with Sand (CL) - stained, moderately plastic, trace to little sand
	4	2.0-3.5	SS	3	4	5	Moist		
								4.0	
	4.5	4.0-5.5	SS	4	4	6	Moist		Brown Lean Clay with Sand (CL) - moderately plastic, little fine to coarse sand, trace gravel (glacial till); random silty sand and gravel layers noted
5									
	4	8.5-10.0	SS	5	6	8	Moist to Very Moist		
10									
	4.5	13.5-15.0	SS	7	9	15	Moist		
15								16.5	
									Gray Sandy Lean Clay with Gravel (CL) - low plasticity, little to some fine to coarse sand, little gravel (glacial till); random silty sand and gravel layers noted
	4.5	18.5-20.0	SS	10	12	15	Moist		
									BOTTOM OF BORING: 20'
								20.0	

*** The stratification lines represent the approximate boundary between soil types and the transition may be gradual.**

720 Greencrest Drive • Westerville, Ohio 43081 • 614-895-1400

JURISDICTIONAL WATERS (WETLAND) DELINEATION REPORT

OF

60-Acre Property
3B's and K Road
Galena, Delaware County, Ohio

PAUL D. BOWYER, CPG
PROJECT MANAGER

ANDREW PEIKEN
PRINCIPAL CONSULTANT

PREPARED BY

Professional Service Industries, Inc.
5555 Canal Road
Cleveland, Ohio 44125

OCTOBER 29, 2020

PSI PROJECT NO. 01373013

TABLE OF CONTENTS

LIST OF APPENDICES

INTRODUCTION

The following Jurisdictional Waters (Wetland) Delineation Report was prepared for an approximately 60-acre study area, located east of 3B's and K Road, in Galena Twp, Delaware County Ohio (Figure 1). The delineation was performed in general accordance with the scope and limitations of the 1987 *United States Army Corps of Engineers Wetland Delineation Manual* (1987 Manual) and the North Central and Northeast Regional Supplement.

For the purposes of this report, the term "wetlands" is used to refer to areas that meet the United States Army Corps of Engineers (USACE) wetland definition without regard to being jurisdictional or isolated.

OBJECTIVE OF WETLAND DELINEATION

The purpose of this delineation was to determine the total amount (acres) of USACE and State of Ohio wetlands and/or linear footage of jurisdictional stream that occurs on the subject property (study area). PSI examined on-site soil, vegetation, hydrology, and reviewed United States Geological Survey (USGS) topographic maps, National Wetland Inventory (NWI) maps, aerial photographs and the Delaware County Soil Survey.

DESCRIPTION OF THE PROPERTY (STUDY AREA)

The study area consisted of the 60-acres of active agricultural land (soy beans) with several wooded field divider areas (narrow wooded corridors), and a narrow wooded area along the east side of the property. A map showing the property boundaries, location of the delineated wetlands and data points is attached as Figure 2.

DATA COLLECTION METHODOLOGY

Paul Bowyer of PSI conducted the delineation of the parcel on October 22, 2020. The distribution of distinctive vegetative communities, combined with topographic and hydrologic data, was used to determine that four (4) wetland areas are present on the property. The wetland areas were photographed to provide the client, and potentially the USACE and/or Ohio EPA with visual information regarding the wetland and stream characteristics, as necessary (Appendix B).

PSI delineated wetlands of the US and/or State in accordance with the US Army Corps of Engineers 1987 Manual and regional supplement using the routine determination method. PSI established wetland boundaries using field measurements. PSI completed Northcentral and Northeast Regional Supplement Wetland Determination Data Forms at locations representing typical plant communities as needed. If applicable, plant communities, soils, and hydrological information were documented at an upland and wetland location at the delineated wetland perimeter at each of the data points.

Points within the study area were examined in accordance with the procedures set forth in the 1987 Manual and regional supplement. The upper soil profile was probed, and samples were examined to determine the soil's consistency, color, and moisture content. The soil color, value and chroma, as well as consistency, were used to characterize sampled soils. The soil moisture condition was used to determine the potential saturation or other wetland

hydrology characteristics. Random soil probe samples were taken to a depth of approximately 24 inches or refusal, whichever depth was shallower. Data collection points were recorded within the study area, including upland points.

After the field inspection was completed, the following sources were consulted to prepare the report:

- The List of Hydric Soils (National Resource Conservation Service (NRCS 2007)
- The National List of Plant Species that Occur in Wetlands: 1988 National Summary (Reed)
- The Soil Survey of Delaware County, Ohio
- USDA/NRCS PLANTS database, http://plants.usda.gov/

Detailed results of the delineation, including specific species of plants, hydrologic indicators and soil characteristics, can be found on the Wetland Determination Data Forms (attached).

One data form was completed for each of the data point locations. Random soil probes were taken to define the upland/wetland boundaries as well as at the documented data point locations. The vicinities of the data points were photographed with wetland characteristics visible. The completed data forms are attached in the appendix of this report. The locations of the data points are shown on Figure 2.

HYDROPHYTIC VEGETATION

Hydrophytic vegetation is typically found in wetland areas. At the subject site, the wetlands were characterized by the presence of hydrophytic emergent species in a former agricultural field setting. The hydrophytic species observed were dominant in the plant community and were growing within hydric soils. The indicator status of each plant species assigned is a measure of how often a species is located in a typical community area. Hydrophytic species do survive and grow in upland areas.

Generally, the status of each plant species is recorded on a data form with the estimated absolute cover percentage to determine if wetland status species are considered dominant for the community. Species prevalence was also determined based on the percentage cover of each species within the plot area.

The number of dominant species within a community with a status of OBL, FACW, or FAC are recorded and divided by the number of dominant species across all strata. If the quotient is more than 50%, the dominance test indicates a wetland community.

The total estimated cover percentage of each species' indicator status is recorded and multiplied by a constant to determine the total prevalence index. If the sum of the prevalence indices is less than or equal to 3.0, the plot area is within a wetland community.

The wetlands present within the study area met the 'Hydrophytic Vegetation' criteria and passed both the Rapid Test for Hydrophytic Vegetation and the Dominance Test. In some instances, a wetland area can be characterized by the lack of vegetation, in contrast to its surroundings.

HYDRIC SOILS

A soil map and description of the soil acronyms are included in the figures section of the Appendix. According to soil probes taken within the study area, hydric soils were present within the wetlands on the property.

The Delaware County soil survey map indicated that the soils mapped on the property consist primarily of the Bennington silt loam, Cardington silt loam, and Pewamo silty clay loam. The Pewamo silty clay loam is listed as a primary hydric soil type; additionally, the area mapped with this soil type generally aligns with were the majority of the site wetlands were observed. The soil map is appended.

NATIONAL WETLAND INVENTORY MAP (NWI)

The National Wetlands Inventory (NWI) map does not show wetland areas on the property. The map does indicate a stream in the location of the ephemeral channel identified by PSI. The NWI map is appended.

HYDROLOGIC CONDITIONS

Hydrology is a dynamic characteristic in wetlands and is often not present during periods of minimal seasonal precipitation. Indirect indicators are used to determine if wetland hydrology such as extended saturation or ponding has been present during the growing season. Examples of indirect hydrology indicators include water staining, flow patterns, buttressing of trees, and moss growth on trees near the ground surface. Water staining in leaves occurs when they are saturated or inundated for extended periods, causing the tannins or brown coloring in the leaves to leach out, leaving a grayish hue to the leaves. Mosses tend to colonize on trees in wet, damp wooded areas.

Evidence of extended soil saturation was observed at the wetlands mapped on the subject property. Observed hydrologic evidence included soil saturation at the time of the site visit. Limited shallow inundation may occur in the wetlands mapped in the spring.

DELINEATION INVESTIGATION RESULTS

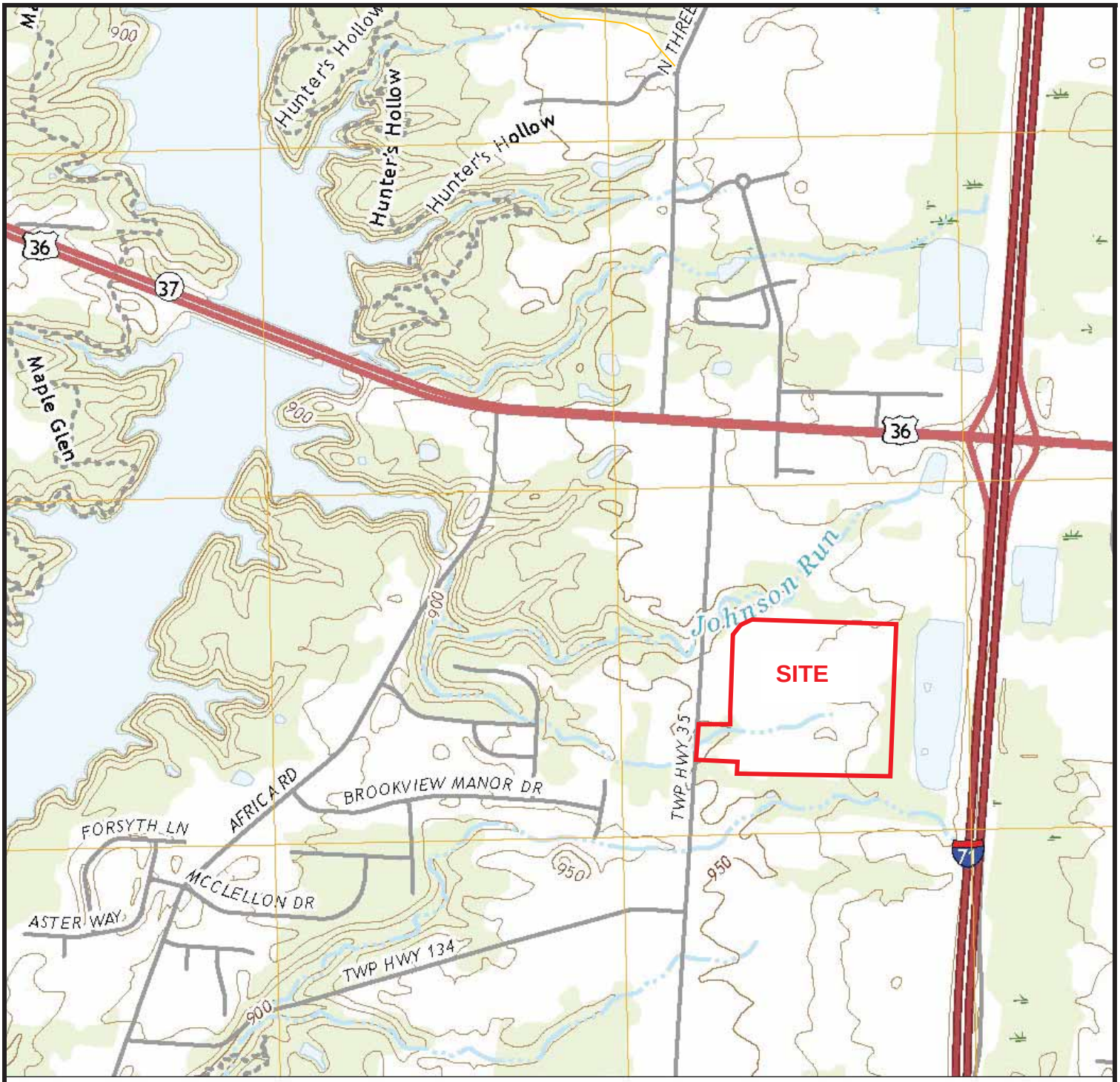
PSI performed a jurisdictional waters delineation on the 60-acre property. The purpose of the delineations was to determine the extent of wetland acreage or other jurisdictional waters currently present within the study areas. **Four (4) wetlands, totaling approximately 0.23 acres** within the study area was delineated and designated Wetlands A through D. The size and location of the delineated wetlands are shown on Figure 2. One ephemeral stream was also identified on the property, flowing within the southern tree-line between the two fields. The following table summarizes the waters identified.

Table 1. Summary of Jurisdictional Waters

Name	Size	Notes
Wetland A	0.03 acres	Emergent wetland along ephemeral channel
Wetland B	0.02 acres	Emergent wetland along ephemeral channel
Wetland C	0.05 acres	Emergent wetland at edge of ag field
Wetland D	0.13 acres	Emergent wetland at corner of ag field
Stream #1	~ 1400 LF	Ephemeral channel (poorly defined in some areas)

The wetlands identified by PSI on this property are located either immediately on or near two ephemeral channels, the flow westward, and eventually into Alum Creek (and Alum Creek Reservoir). However, based on current USACE jurisdictional criteria, there is potential that USACE will consider these wetlands (and the streams) to be non-jurisdictional, based on the ephemeral nature of the stream channels. Thus, these wetlands may be considered “isolated”. It should be noted that isolated wetlands area regulated (and permitted) in a similar manor to jurisdictional wetlands in Ohio, by the Ohio EPA. Only the USACE can make the final determination as to the wetlands jurisdictional status.

APPENDIX A - FIGURES

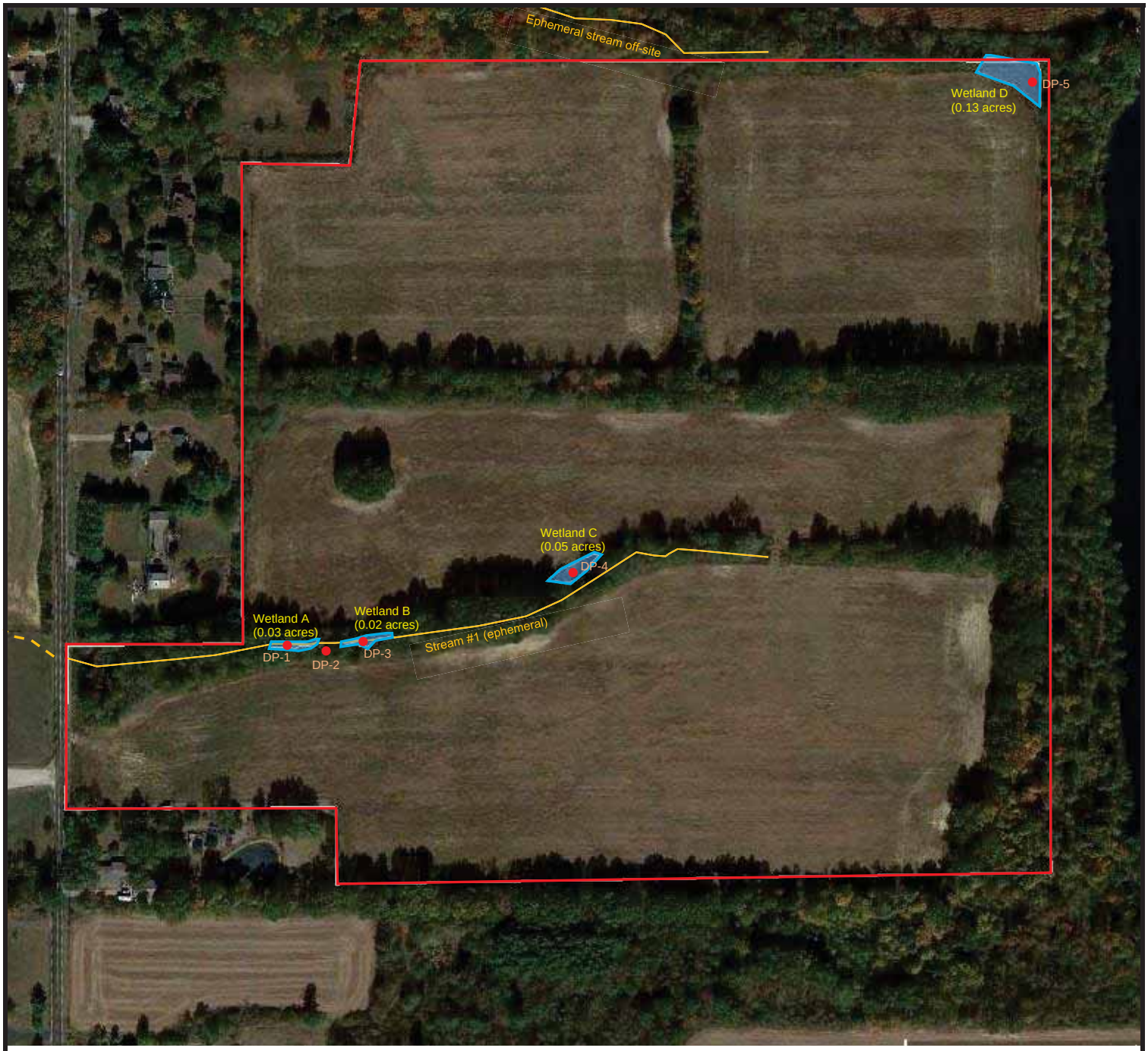


60-Acre Property
3B's and K Road
Galena, Ohio

Figure 1

Topo Map
(2019 topo map)

intertek psi



N
W E
S

60-Acre Property
3B's and K Road
Galena, Ohio

Figure 2

Wetland Delineation Map (Oct 2020)
(2019 photo)

intertek psi

Professional Service Industries, Inc., 5555 Canal Road, Cleveland, Ohio 44125

Map Scale: 1:4,400 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Delaware County, Ohio
Survey Area Data: Version 19, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 17, 2015—Oct 2, 2017

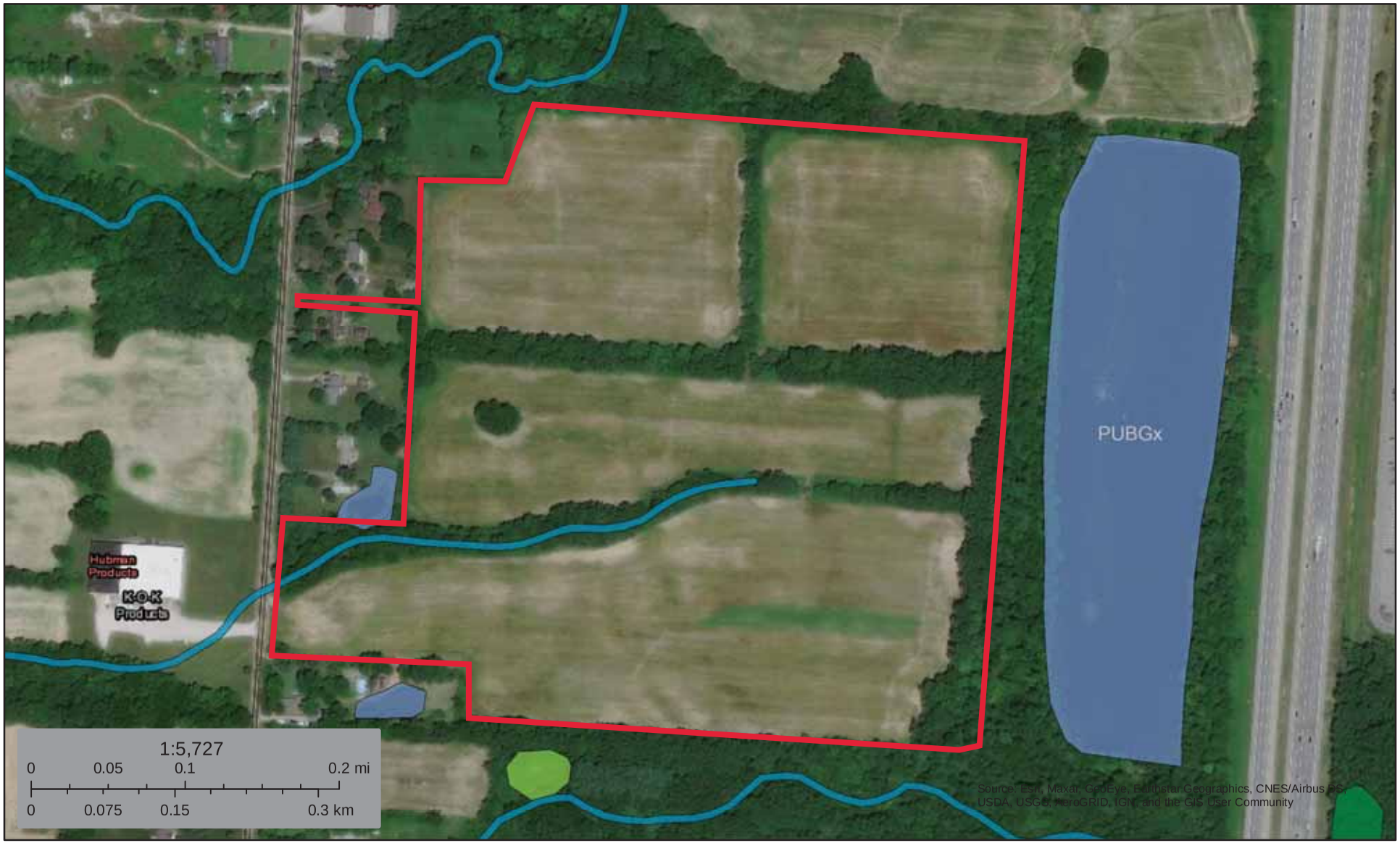
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BeA	Bennington silt loam, 0 to 2 percent slopes	11.7	18.8%
BeB	Bennington silt loam, 2 to 6 percent slopes	31.1	49.9%
Crd1B1	Cardington silt loam, 2 to 6 percent slopes	1.2	1.9%
Crd1C2	Cardington silt loam, 6 to 12 percent slopes, eroded	0.1	0.1%
PwA	Pewamo silty clay loam, 0 to 1 percent slopes	18.2	29.2%
Totals for Area of Interest		**62.3**	**100.0%**

U.S. Fish and Wildlife Service
National Wetlands Inventory

map



October 29, 2020

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine