



March 30, 2021

Mr. Judd Dayton, P.E.
Snyder, Secary & Associates, LLC
2000 Linglestown Road, Suite 304
Harrisburg, PA 17110

**RE: Stormwater Infiltration Summary Letter
7600 Linglestown Road
West Hanover Township, Dauphin County, Pennsylvania
Kleinfelder Project No.: 01900271.003A**

Dear Mr. Dayton,

In accordance with your request, Kleinfelder, Inc. (Kleinfelder), has completed a Stormwater Infiltration Summary Report for the above referenced project site to evaluate the suitability of the subsurface soils for the infiltration of stormwater. This correspondence serves to transmit the results of our evaluation.

SITE AND PROJECT DESCRIPTION

The project site currently consists of an agricultural and densely wooded parcel of land located at 7600 Linglestown Road in West Hanover Township, Dauphin County, Pennsylvania. The project site is bordered to the north by agricultural fields, to the east and west by wooded areas and to the south by Linglestown Road. Topography across the project site consists of gentle to steep rolling terrain sloping generally down-gradient towards the southeast with approximately 150 feet of grade variation across the project site. The approximate location of the site in relation to the surrounding area is depicted on the *Topographic Map* (Figure 1) presented within the Appendix.

According to the *Infiltration Test Exhibit* (Plan), prepared by Snyder-Secary & Associates, LLC, the project will consist of constructing a new warehouse/distribution facility. The structure is anticipated to measure 1,117,200 square feet in plan area, comprised of conventional steel-frame construction with exterior, tilt-up cast-in-place (or pre-fabricated) concrete walls with the ground floor slab supported on grade. Development of this project will also include constructing parking areas, truck aprons, drive lanes, subsurface utilities and stormwater management facilities. Based on existing and proposed grades, maximum cuts of approximately 19 feet are anticipated to be required to reach the proposed stormwater invert elevations.

SCOPE OF WORK

The objective of our work was to determine the permeability of the invert soils, identify any limiting zones (i.e. bedrock, groundwater, or seasonal high-water table) and address PADEP requirements as they relate to stormwater management. This objective was accomplished through a scope of work which included a subsurface exploration, and preparation of this report. This report presents a summary of the work completed, conditions encountered and results of our engineering analysis of subsurface conditions.

GEOLOGY

According to the Pennsylvania Geologic Survey's *Atlas of Preliminary Geologic Quadrangles*, Fourth Series, 1981, the project site is underlain by the Hamburg Sequence and the Limestone of Hamburg Sequence (geologic symbols Oh and Oh1, respectively). The property within its geologic settings is presented on the *Geologic Map* (Figure 2) found within the Appendix.

The *Engineering Characteristics of the Rocks of Pennsylvania*, second edition, 1982, published by the Pennsylvania State Geologic Survey, describes the rock in these formations as transported rocks of the Hamburg overthrust; gray, greenish-gray and maroon shale, silty and siliceous in many places, dark-gray impure sandstone; medium to light gray, finely crystalline limestone and shaley limestone.

The shale in the formations is moderately well bedded and thin, while the sandstone is well bedded and thick. The limestone is also well bedded, but flaggy. Shale fractures form a seamy to platy pattern, are well developed, highly abundant; variably spaced, open and steeply dipping. Sandstone fractures form a blocky pattern, are well developed, moderately abundant; evenly spaced, open and steeply dipping. Limestone fractures form a platy pattern, are poorly developed, moderately abundant; open and steeply dipping.

The shale in the formations is moderately resistant to weathering and is moderately to highly weathered to a deep depth, resulting in loose rubble of pencil-like fragments to rectangular plates. The sandstone is moderately resistant to weathering and is moderately weathered to a shallow depth, resulting in medium to large, irregular.

The Limestone of Hamburg Sequence is comprised of carbonate lithology which is subject to dissolution and the development of sinkholes and other karst-related features. The *Sinkhole Map of Pennsylvania*, prepared by William Kochonov of the Pennsylvania Geologic Survey, does not show any mapped karst features within or surrounding the site. No karst features (i.e. sinkholes, closed depressions and/or bedrock outcrops) were observed at the time of the fieldwork.

SUBSURFACE EXPLORATION PROGRAM

To characterize the subsurface conditions across the footprints of the proposed stormwater management facilities, 22 test pits were excavated on March 11 through 15, 2021. Supervision and monitoring of the subsurface exploration were provided by a representative of Kleinfelder who field located the test locations based on the previously referenced Plan. The approximate test pit locations are shown on the *Exploration Plan* (Figure 3) presented within the Appendix.

The test pits were excavated utilizing a John Deere 310G tracked excavator. A detailed account of the material encountered during the excavation of each test pit as well as the infiltration test depths and infiltration rates (where applicable) are presented on the *Test Pit Logs* within the Appendix.

LABORATORY TESTING

Soil samples retrieved from the site were visually reviewed and classified by Kleinfelder. Representative soil samples were subjected to laboratory analyses to verify visual classifications and aid in establishing preliminary engineering parameters for foundation design analysis in accordance with the following schedule:

- Natural Moisture Content (ASTM D2216)
- Sieve Analysis (ASTM D422)
- Atterberg Limits Determination (ASTM D4318)

Unified Soil Classification System (USCS) Group Symbols and ASTM Group Names have been assigned to the soils analyzed. The results of the laboratory analyses are presented within the table below and graphical depictions of the particle size analyses are presented in the Appendix.

STANDARD CLASSIFICATION RESULTS											
Location	Depth (feet)	Soil Type	% Gravel	% Sand	% Fines	LL	PL	PI	Natural Moisture Content	USCS Group Symbol	ASTM Group Name
IT-2	7 – 10	Stratum I	50.6	44.5	4.8	37	34	3	18.6%	GW	Well-graded GRAVEL with Sand
IT-18	1 – 3		66.4	28.4	5.3	36	26	10	9.4%	GW	Well-graded GRAVEL with Silt and Sand
IT-22	1.5 – 2	Stratum II	12.4	39.6	48.0	31	25	6	22.0%	SM	Silty SAND

LL-Liquid Limit; PL-Plastic Limit; PI-Plasticity Index

SUBSURFACE CONDITIONS

SOIL

Surficial Materials

The test pits were covered by approximately 6 to 24 inches of topsoil, with exception of test pits IT-14 through IT-16, IT-18 and IT-19, where no topsoil was present. Topsoil thicknesses may vary in unexplored areas of the project site.

Stratum I – Reddish brown to brown to yellow to tan to gray Well-Graded GRAVEL with varying amounts of Silt and Sand

Stratum II was encountered within each test pit completed, with the exception of test pits IT-12, IT-13, IT-20 and IT-21, and extended to their termination depths ranging from approximately 1 to 12 feet below existing site grades. Laboratory testing conducted on representative samples of Stratum II show this soil to be poorly graded overall and plastic, with natural moisture contents ranging of 9.4% and 18.6%. Stratum II is described under the USCS as Well-graded GRAVEL with Sand (GW) and Well-graded GRAVEL with Silt and Sand (GW).

Stratum II – Reddish brown to brown Silty SAND

Stratum I was encountered within test pits IT-1, IT-12, IT-13, IT-20, IT-21 and IT-22, and extended to depths ranging from approximately 4 to 13 feet below existing site grades. Laboratory testing conducted on a representative sample of Stratum I shows this soil to be poorly graded and plastic, with a natural moisture content of 22.0%. Stratum I is described under the USCS as Silty SAND (SM).

BEDROCK

The bedrock surface was encountered within 9 of the 22 test pits completed, at depths ranging from approximately 1 to 10 feet below existing site grades. The bedrock surface was defined as the depth at which the bucket of the excavator could no longer advance. Different equipment may yield different results.

Based on published geologic data, the bedrock surface beneath the project site is pinnacled with significant variation in the elevation of the bedrock surface over short lateral distances. The erratic surface profile of the underlying bedrock is typical of carbonate geologic formations, such as the one which underlies the site. Therefore, the potential exists for the bedrock surface to be encountered at elevations which vary significantly from the elevations encountered during our exploration. The Contractor(s) may utilize this data to understand the bedrock surface, however, should use caution when interpolating bedrock elevation information between test locations due to the underlying geologic formation.

GROUNDWATER/SOIL MOTTLING

Perched groundwater was encountered within test pits IT-9 through IT-13 at depths ranging from approximately 2 to 3 feet below existing grades. Groundwater was encountered within test pits IT-11, IT-12, IT-13, IT-20, IT-21, and IT-22 at depths ranging from 5.5 to 12.5 feet below existing site grades. Soil mottling (indicating a seasonal high water table and/or poorly draining soils) was not observed within the test pits completed. These observations were made at the time of the field operation and the groundwater table elevation will vary with daily, seasonal, climatological variations and anthropogenic activities.

CONSIDERATION OF KARST GEOLOGY

The following construction considerations are provided to minimize the potential for development of sinkholes at the site both during and following construction.

- Surface water should not be allowed to collect or pool in low lying areas of the site and should be directed to appropriate stormwater channels. Expedient backfilling or grading of low-lying areas will also help minimize the potential for the development of sinkholes.
- The bases of all foundation excavations should be reviewed for unusually soft or wet soil conditions. Any unstable areas encountered should be further excavated and reviewed by the geotechnical engineer to determine the extent of any solution activity so that remedial measures can be designed and implemented.
- The extent of excavations should be kept to a minimum and the influx of surface water into excavations should be minimized.
- Positive drainage away from the proposed structure should always be maintained. Roof drains should also be directed away from the structure and into designated storm sewer connections.
- Storm sewer conveyance lines should be constructed with watertight joints
- Unpaved areas, swales, and/or surface/subsurface stormwater management facilities should be avoided adjacent to building/foundation areas.
- Exterior backfill around foundations and utilities should consist of fine-grained, low permeable soils (i.e. silt and clay) in an effort to limit concentrated stormwater infiltration.

The above recommendations constitute best management practices for construction and development in areas underlain by karst geologic formations. The site Owner must recognize the risks associated with development in areas underlain by karst geologic formations. Contingencies should be made in the construction schedule and budget for the repair of sinkholes and unstable soil conditions encountered during development of the site.

INFILTRATION TESTING

To evaluate the infiltration of stormwater, infiltration testing was anticipated to be completed within each test pit excavated. Where infiltration testing was completed, it was completed in accordance with the Pennsylvania Stormwater Best Management Practices Manual, latest Edition. Each test pit was anticipated to extend a minimum of 2 feet below the proposed invert elevation to review for the presence of limiting zones (i.e. bedrock, groundwater and/or soil mottling). Infiltration testing was not completed within 7 of the test pits due to limiting zones encountered. The results of the infiltration testing are presented in the table below.

INFILTRATION TEST RESULTS					
Test Location	Existing Elevation (feet)	Proposed Infiltration Test Elevation (feet)	Actual Infiltration Test Elevation (feet)	Limiting Zone Elevation (feet)	Infiltration Rate (inches/hour)*
IT-1	565	562	565	Not Encountered at 556	21.0
IT-2	578	568	568	Not Encountered at 566	0.2
IT-3	578	568	570	Bedrock at 568	9.0
IT-4	580	568	573	Not Encountered at 571	4.5
IT-5	580	570	570	Not Encountered at 568	12.0
IT-6	580	570	570	Not Encountered at 568	12.0
IT-7	580	570	570	Not Encountered at 568	12.0
IT-8	580	570	570	Not Encountered at 568	12.0
IT-9	542	532	No Test	Perched Water at 539 Groundwater at 535.5 Bedrock at 532	No Test
IT-10	542	532	538	Perched Water at 539 Groundwater at 536	0.4
IT-11	538	532	No Test	Perched Water at 536 Groundwater at 531	No Test
IT-12	537	532	No Test	Perched Water at 534.5 Groundwater at 530.5	No Test
IT-13	536	532	No Test	Perched water at 533.5 Groundwater at 530	No Test
IT-14	558	558	No Test	Bedrock at 555	No Test
IT-15	559	558	No Test	Bedrock at 557.5	No Test
IT-16	560	558	No Test	Bedrock at 558	No Test
IT-17	557	555	556	Bedrock at 554	3.6
IT-18	557	555	555	Not Encountered at 553	7.2
IT-19	553	555	552	Bedrock at 549.5	6.0
IT-20	540	535	535	Groundwater at 533	7.2
IT-21	545	535	535	Groundwater at 532.5	16.8
IT-22	563	562	561.8	Groundwater at 557.5	12.0

*Infiltration rates are field rates and not factored
 -Shaded cells indicate where testing was completed above proposed invert elevation due to limiting zones
 -Bold text indicates infiltration testing completed immediately below topsoil layer

SUMMARY OF DATA & CONCLUSIONS

Based on the results of our field exploration and data obtained, we offer the following comments regarding the infiltration of stormwater at the project site.

- Infiltration testing was conducted within the naturally occurring soils of Stratum I and Stratum II.
- The bedrock surface was encountered within 9 of the 22 test pits completed, at depths ranging from approximately 1 to 10 feet below existing site grades.
- Perched groundwater was encountered within test pits IT-9 through IT-13 at depths ranging from approximately 2 to 3 feet below existing grades. Groundwater was encountered within test pits IT-11, IT-12, IT-13, IT-20, IT-21, and IT-22 at depths ranging from 5.5 to 12.5 feet below existing site grades.
- Soil mottling was not observed within the test pits completed.
- The unfactored field infiltration rates achieved ranged from 0.2 to 21.0 inches per hour. The PADEP recommended rate for infiltration of stormwater is 0.1 to 10 inches per hour.

LIMITATIONS

This work was performed in a manner consistent with that level of care and skill ordinarily exercised by other members of Kleinfelder's profession practicing in the same locality, under similar conditions and at the date the services are provided. Our conclusions are based on a limited number of observations and data. It is possible that conditions could vary between or beyond the data evaluated. Further, Kleinfelder assumes no liability for interpolation of data between the specific testing locations discussed herein. Kleinfelder makes no other representation, guarantee, or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

The varied nature of carbonate geology precludes absolute certainty in assessing sinkhole formation. Therefore, the Owner should be aware that conditions could be encountered during construction that would require modifications to our recommendations. Kleinfelder makes no warranty or guarantee with regard to the development of sinkholes on the project site.

This report may be used only by the Client and the registered design professional in responsible charge and only for the purposes stated for this specific engagement within a reasonable time from its issuance, but in no event later than 2 years from the date of the report.

Our scope of services for this exploration and report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this site.

CLOSING

We thank you for the opportunity to work on this project with you. Should you have any questions or require any additional information, please do not hesitate to contact us.

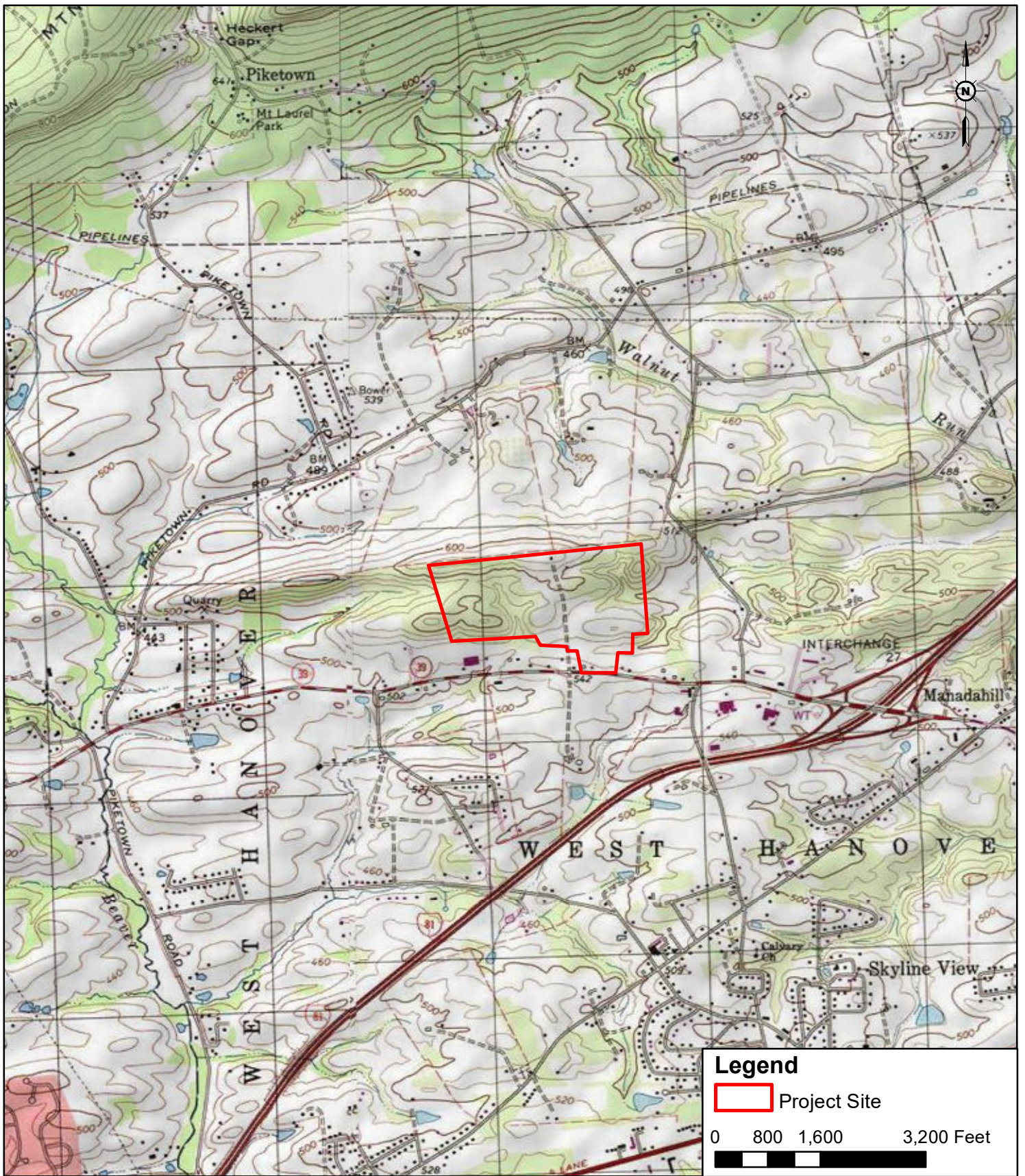
Respectfully Submitted,
KLEINFELDER, INC.



Jason E. Trimble
Project Manager



Trevor L. Dombach
Program Manager



*Source - USGS 15 - Minute Topographic Quadrangle, Provided by ESRI

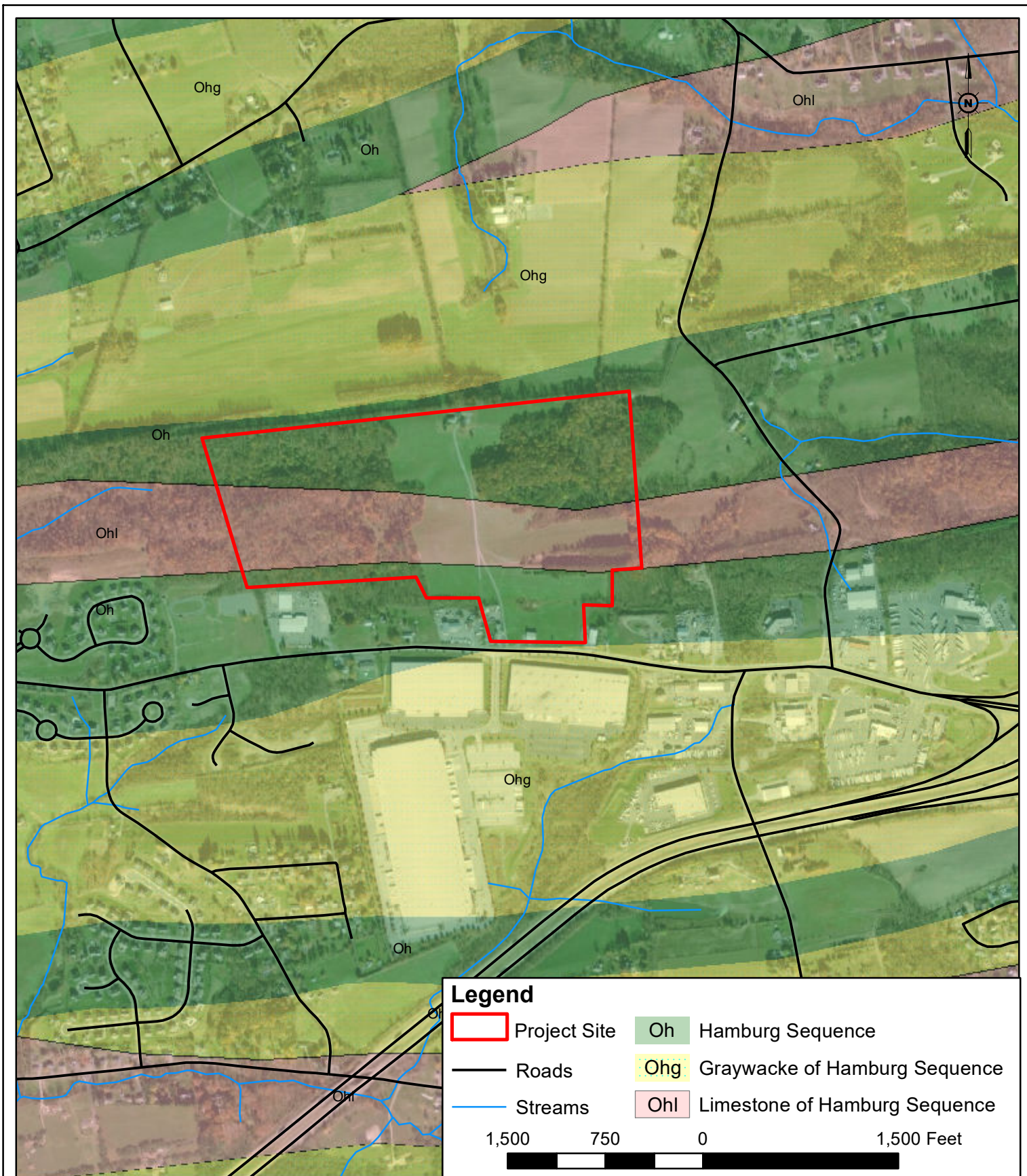
SCALE: AS SHOWN	DRAWING NUMBER: FIGURE 1
DRAWN BY: C. WEEMS	CHECKED BY: J. TRIMBLE
APPROVED BY: M. GIUNTA	DATE: 3-5-2021

TOPOGRAPHIC MAP
 PREPARED FOR
7600 LINGLESTOWN ROAD
 WEST HANOVER TOWNSHIP DAUPHIN COUNTY PENNSYLVANIA



KLEINFELDER
Bright People. Right Solutions.

435 INDEPENDENCE AVE., SUITE C
 MECHANICSBURG, PA 17055
 PH (717) 458-0800
 FAX (717) 458-0801



*Source - Map 61 - Atlas of Preliminary Geologic Quadrangle Maps of Pennsylvania, 1981, Pa Geological Survey


SCALE: AS SHOWN	DRAWING NUMBER: FIGURE 2
DRAWN BY: C. WEEMS	CHECKED BY: J. TRIMBLE
APPROVED BY: M. GIUNTA	DATE: 3-5-2021

GEOLOGIC MAP
 PREPARED FOR
7600 LINGLESTOWN ROAD
 WEST HANOVER TOWNSHIP DAUPHIN COUNTY PENNSYLVANIA

435 INDEPENDENCE AVE., SUITE C
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Legend


 Approximate Infiltration Test Location

0 100 200 400 600
 Feet

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

SCALE: 1" = 200'	DRAWING NUMBER: FIGURE 3
DRAWN BY: C. WEEMS	CHECKED BY: J. TRIMBLE
APPROVED BY: M. GIUNTA	DATE: 7-13-2020

BASE PLAN:
 Infiltration Exhibit For
 7464 & 7600 Linglestown Road
 PROVIDED BY:
 Snyder, Secary & Associates, LLC.
 DATE:
 January 29, 2021

EXPLORATION PLAN
 PREPARED FOR
7600 LINGLESTOWN ROAD
 WEST HANOVER TOWNSHIP DAUPHIN COUNTY PENNSYLVANIA



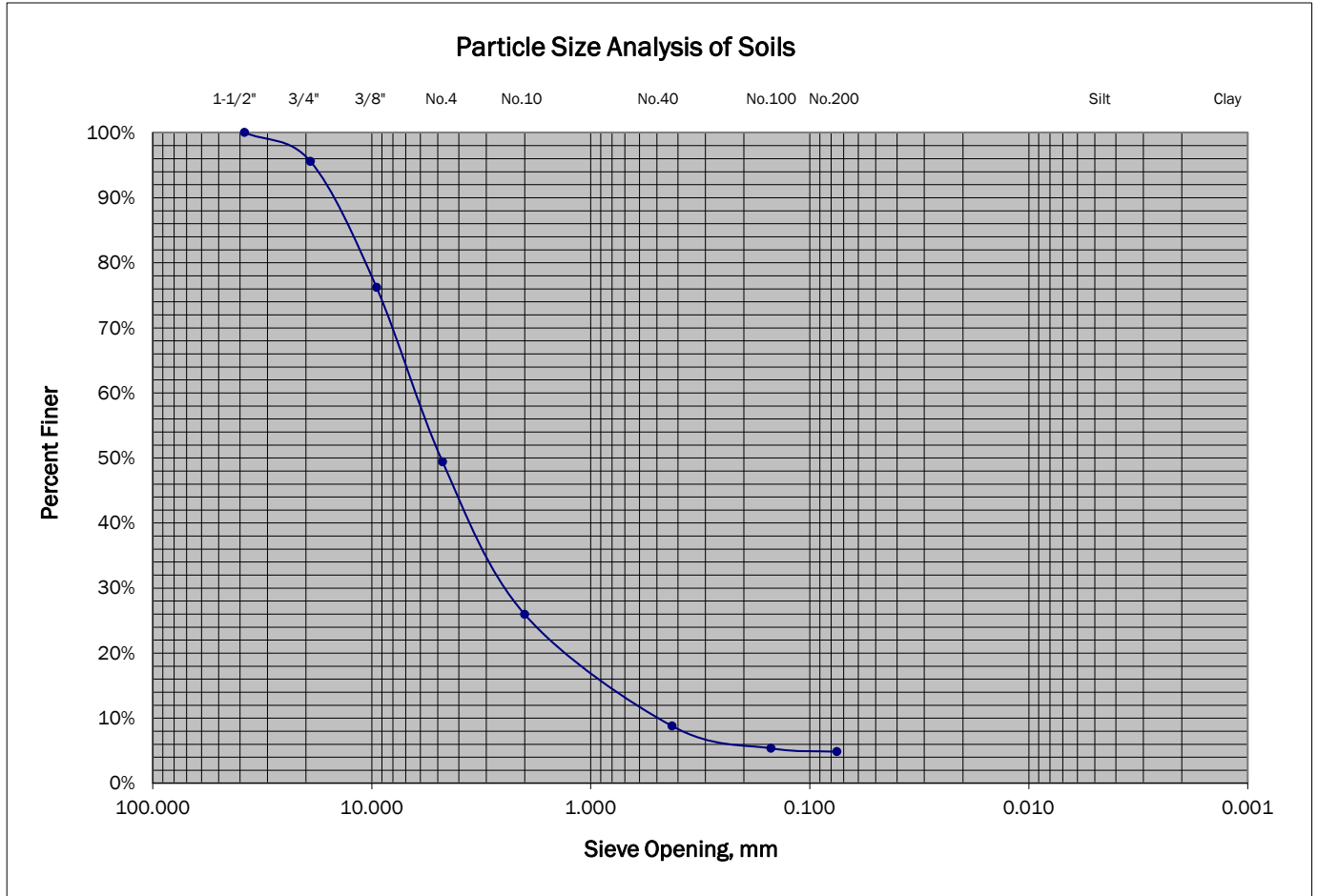
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 PH (717) 458-0800



Soil Classification Report

Per ASTM Designations D 2487 and D 2488

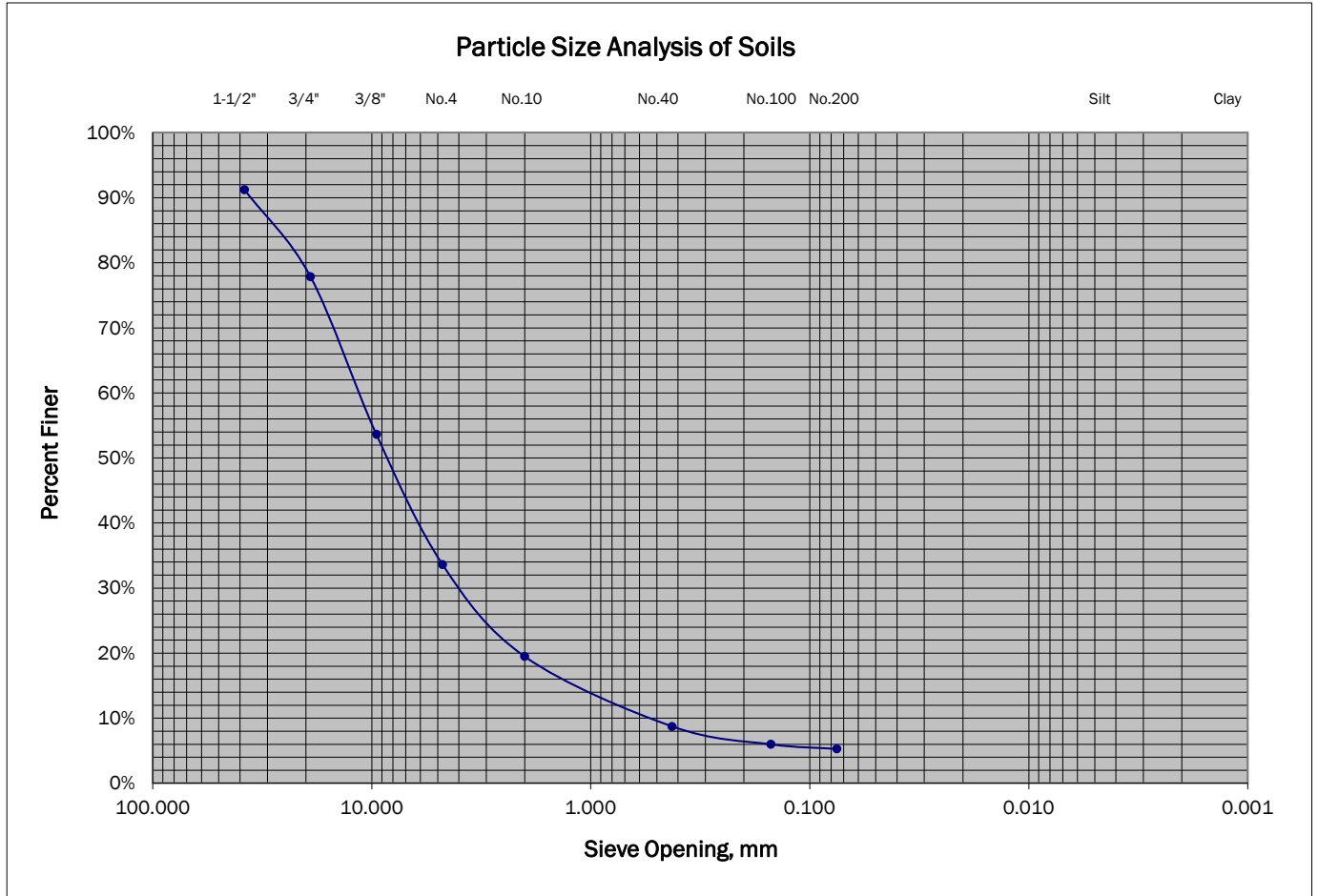


As-Received Moisture 18.6%		Particle Size Distribution						
USCS Classification: Well-graded GRAVEL with Sand (GW)		US Standard Sieve Size		Opening (mm)	%Finer			
Gravel: 50.6%	Coarse: 4.4%	Fine: 46.2%		GRAVEL	Coarse			
Sand: 44.5%	Coarse: 23.4%	Medium: 17.2%	Fine: 4.0%		1-1/2"			
Fines: 4.8%	Silt: 0.0%	Clay: 0.0%			3/4"			
Gravel Description: Subangular					3/8"			
Sand Description: Subangular				No. 4		49.4%		
Consistency: N/A		Dry Strength: N/A		SAND	Coarse			
Dilatancy: N/A		Toughness: N/A			No. 10		26.0%	
Structure: Blocky		Cementation: Weak			Medium		No. 40	
					No. 100		0.150	
				Fine		No. 200	0.075	4.8%
				Hydrometer Analysis	Silt Size		0.005	
					Clay Size		0.001	
				D ₆₀ : 6.5	D ₃₀ : 2.6	D ₁₀ : 0.5	Cu: 13	Cc: 2.08
Test Pit: IT-2		Atterberg Limits		LL: 37	PL: 34	PI: 3		
Sample: S-1		Depth: 7' - 10'		Description: Yellow to reddish brown Well-graded GRAVEL with Sand				
Project: 7600 Lingestown Road Warehouse		Remarks: Stratum I						
Client: Snyder, Secary & Associates, LLC		Report Date: March 19, 2021						
Kleinfelder Project Number: 01900271.003A								



Soil Classification Report

Per ASTM Designations D 2487 and D 2488

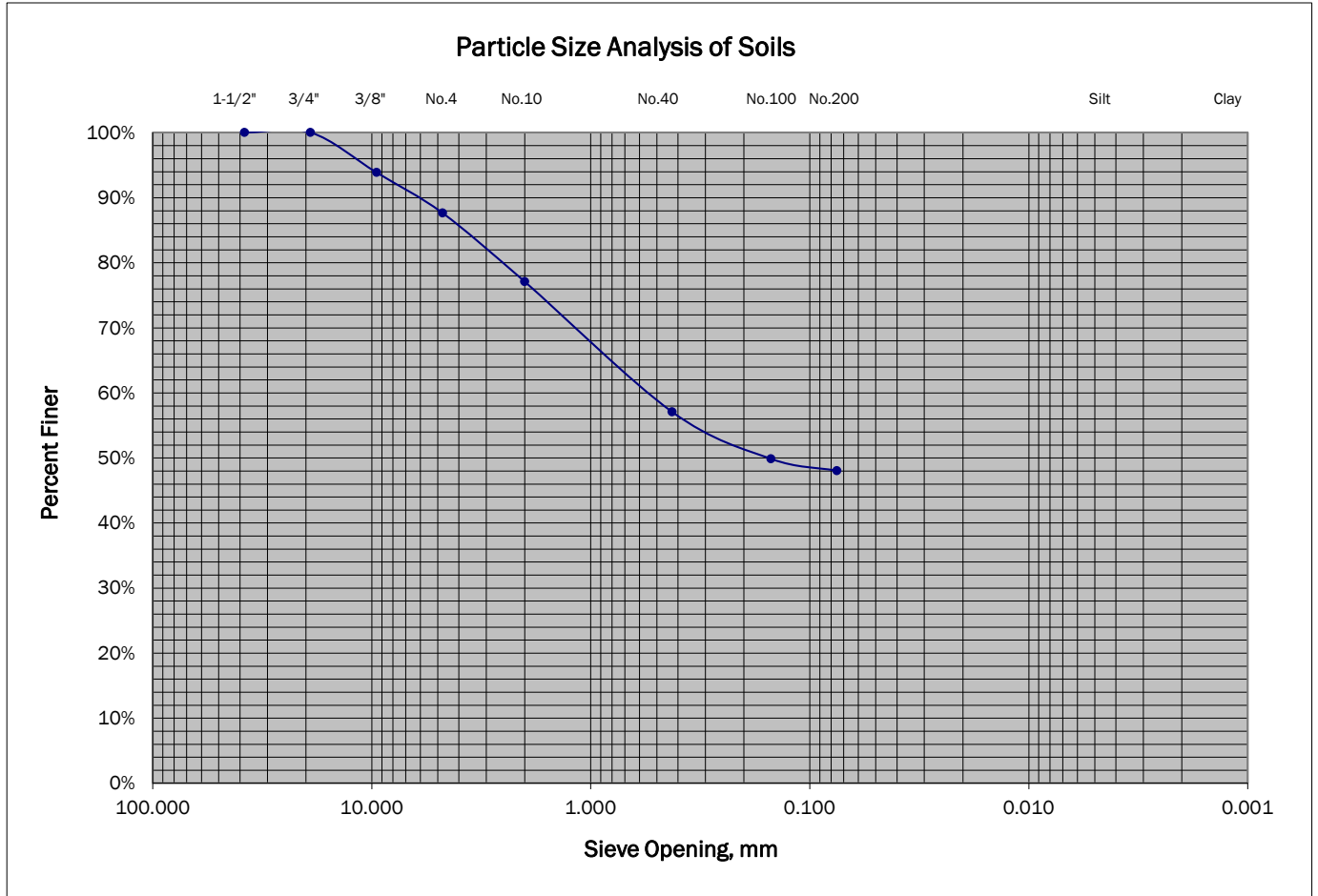


As-Received Moisture 9.4%	Particle Size Distribution				
USCS Classification: Well-graded GRAVEL with Silt and Sand (GW-GM)	US Standard Sieve Size		Opening (mm)	%Finer	
Gravel: 66.4% Coarse: 22.2% Fine: 44.2%	GRAVEL	Coarse	1-1/2"	38.0	91.2%
Sand: 28.4% Coarse: 14.1% Medium: 10.7% Fine: 3.5%		Fine	3/4"	19.0	77.8%
Fines: 5.3% Silt: Clay:			3/8"	9.50	53.6%
Gravel Description: Subangular			No. 4	4.75	33.6%
Sand Description: Subangular	SAND	Coarse	No. 10	2.00	19.5%
Consistency: N/A Dry Strength: N/A		Medium	No. 40	0.425	8.7%
Dilatancy: N/A Toughness: N/A			No. 100	0.150	6.0%
Structure: Blocky Cementation: Weak		Fine	No. 200	0.075	5.3%
	Hydrometer Analysis	Silt Size	0.005		
		Clay Size	0.001		
	D ₆₀ : 12	D ₃₀ : 3	D ₁₀ : 0.58	Cu: 21	Cc: 1.29
Test Pit: IT-18	Atterberg Limits		LL: 36	PL: 26	PI: 10
Sample: S-1 Depth: 1' - 3'	Description: Reddish brown Well-graded GRAVEL with Silt and Sand				
Project: 7600 Lingelstown Road Warehouse	Remarks: Stratum I				
Client: Snyder, Secary & Associates, LLC					
Kleinfelder Project Number: 01900271.003A	Report Date: March 19, 2021				



Soil Classification Report

Per ASTM Designations D 2487 and D 2488



As-Received Moisture: 22.0%	Particle Size Distribution				
USCS Classification: Silty SAND (SM)	US Standard Sieve Size		Opening (mm)	%Finer	
Gravel: 12.4% Coarse: 0.0% Fine: 12.4%	GRAVEL	Coarse	1-1/2"	38.0	100.0%
Sand: 39.6% Coarse: 10.6% Medium: 20.0% Fine: 9.1%		Fine	3/4"	19.0	100.0%
Fines: 48.0% Silt: Clay:			3/8"	9.50	93.8%
Gravel Description: Subrounded			No. 4	4.75	87.6%
Sand Description: Subrounded	SAND	Coarse	No. 10	2.00	77.1%
Consistency: N/A Dry Strength: N/A		Medium	No. 40	0.425	57.1%
Dilatancy: N/A Toughness: N/A			No. 100	0.150	49.9%
Structure: Homogeneous Cementation: Weak			Fine	No. 200	0.075
	Hydrometer Analysis	Silt Size	0.005		
		Clay Size	0.001		
	D ₆₀ :	D ₃₀ :	D ₁₀ :	Cu:	Cc:
Test Pit: IT-22	Atterberg Limits		LL: 31	PL: 25	PI: 6
Sample: S-1 Depth: 1.5' - 2'	Description: Reddish brown Silty SAND				
Project: 7600 Lingestown Road	Remarks: Stratum II				
Client: Snyder, Secary & Associates, LLC					
Kleinfelder Project Number: 01900271.003A	Report Date: March 19, 2021				

PLOTTED: 03/29/2021 03:04 PM BY: BWildasin

Date Begin - End: 3/15/2021 **Excavation Company:** John W. Gleim, Jr. Excavating inc.
Logged By: B. Wildasin **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: N/A degrees **Excav. Dimensions:** ft
Weather: 50°F Clear

TEST PIT LOG IT-1

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION		LABORATORY RESULTS									
			Lithologic Description	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks		
			Approximate Ground Surface Elevation (ft.): 565.00 Surface Condition: Sparse Vegetation											
			24" Dark brown organic soil											
			Stratum II Silty SAND (SM): reddish brown, moist	563.0										Infiltration test conducted at 3'.
560	5		Stratum I Clayey GRAVEL with Sand (GW): tan to gray, moist, with Cobble-sized rock fragments, highly weathered rock	559.5										
				556.0										
555	10		The test pit was terminated at approximately 9 ft. below ground surface. The test pit was backfilled with excavated material on March 15, 2021.		GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.									
550	15													

PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT FILE: KLF_gint_master_non_klf GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB []_KLF_BORING/TEST PIT SOIL LOG



PROJECT NO.: 01900271
 DRAWN BY: DT
 CHECKED BY: BW
 DATE: 3/17/2021
 REVISED: 3/18/2021

TEST PIT LOG IT-1

7600 Linglestown Road
 West Hanover Township,
 Dauphin County, Pennsylvania

PLOTTED: 03/29/2021 03:04 PM BY: BWildasin
 OFFICE FILTER: MECHANICSBURG
 PROJECT NUMBER: 01900271.003A
 GINT FILE: KLF_gint_master_non_klf
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End: 3/15/2021	Excavation Company: John W. Gleim, Jr. Excavating inc.	TEST PIT LOG IT-2
Logged By: B. Wildasin	Excavation Crew: D. Deatrich	
Hor.-Vert. Datum: Not Available	Excavation Equip.: John Deere 130G Excavator	
Plunge: N/A degrees	Excav. Dimensions: ft	
Weather: 50°F Clear		

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 578.00 Surface Condition: Sparse Vegetation				Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
			Lithologic Description												
			12" Dark brown organic soil												
			Stratum I Well-Graded GRAVEL with Sand (GW): yellow to reddish brown, moist, micaceous												
575			577.0												
570	5														Infiltration test conducted at 7'.
565	10														
560	15														
			566.0				The test pit was terminated at approximately 12 ft. below ground surface. The test pit was backfilled with excavated material on March 15, 2021.								
							GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.								

	PROJECT NO.: 01900271	TEST PIT LOG IT-2	
	DRAWN BY: DT	7600 Linglestown Road West Hanover Township, Dauphin County, Pennsylvania	
CHECKED BY: BW			
DATE: 3/17/2021			
REVISED: 3/18/2021			

PLOTTED: 03/29/2021 03:04 PM BY: BWildasin

Date Begin - End: 3/15/2021 **Excavation Company:** John W. Gleim, Jr. Excavating inc.
Logged By: B. Wildasin **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: N/A degrees **Excav. Dimensions:** ft
Weather: 50°F Clear

TEST PIT LOG IT-3

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION		LABORATORY RESULTS							
			Lithologic Description	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
			Approximate Ground Surface Elevation (ft.): 578.00 Surface Condition: Sparse Vegetation									
			14" Dark brown organic soil									
			Stratum I Well-Graded GRAVEL with Sand (GW): yellow to reddish brown, moist	576.8								
575												
5												
570												
												Infiltration test conducted at 7'.
10				568.0								
			The test pit was terminated because of excavator refusal (↑) at approximately 10 ft. below ground surface on bedrock. The test pit was backfilled with excavated material on March 15, 2021.		GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.							
565												
15												
560												

OFFICE FILTER: MECHANICSBURG

PROJECT NUMBER: 01900271.003A

GINT FILE: KLF_gint_master_non_klf
GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB



PROJECT NO.: 01900271
 DRAWN BY: DT
 CHECKED BY: BW
 DATE: 3/17/2021
 REVISED: 3/18/2021


TEST PIT LOG IT-3

7600 Linglestown Road
 West Hanover Township,
 Dauphin County, Pennsylvania

PLOTTED: 03/29/2021 03:04 PM BY: BWildasin

Date Begin - End: 3/15/2021 **Excavation Company:** John W. Gleim, Jr. Excavating inc.
Logged By: B. Wildasin **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: N/A degrees **Excav. Dimensions:** ft
Weather: 50°F Clear

TEST PIT LOG IT-4

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION		LABORATORY RESULTS							
			Lithologic Description	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
			Approximate Ground Surface Elevation (ft.): 580.00 Surface Condition: Sparse Vegetation									
			12" Dark brown organic soil									
			Stratum I Well-Graded GRAVEL with Sand (GW): yellow to reddish brown, moist	579.0								
575	5											
570	10		The test pit was terminated because of excavator refusal (↑) at approximately 9 ft. below ground surface on bedrock. The test pit was backfilled with excavated material on March 15, 2021.	571.0								Infiltration test conducted at 7'.
					GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.							

PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB GINT_TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB



PROJECT NO.: 01900271
 DRAWN BY: DT
 CHECKED BY: BW
 DATE: 3/17/2021
 REVISED: 3/18/2021

TEST PIT LOG IT-4

7600 Linglestown Road
 West Hanover Township,
 Dauphin County, Pennsylvania

PLOTTED: 03/29/2021 03:04 PM BY: BWildasin

Date Begin - End: 3/11/2021 **Excavation Company:** John W. Gleim, Jr. Excavating inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 55°F Clear

TEST PIT LOG IT-5

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION		LABORATORY RESULTS								
			Lithologic Description		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
			Latitude: 40.35650° N Longitude: -76.73998° E Approximate Ground Surface Elevation (ft.): 580.00 Surface Condition: Sparse Vegetation										
			Topsoil: 6" brown organic soil Stratum I 579.5 Well-Graded GRAVEL with Silt and Sand (GW): medium to coarse-grained, subangular, low plasticity, dark reddish brown, moist to dry, blocky, weakly cemented										
575	5												
570	10												
565	15		568.0 The test pit was terminated at approximately 12 ft. below ground surface. The test pit was backfilled with excavated material on March 11, 2021.		GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An iPad integrated GPS unit was used to locate the exploration with an accuracy of 0 meters.								

PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT FILE: KLF_gint_master_non_klf GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB _KLF_BORING\TEST PIT SOIL LOG



PROJECT NO.: 01900271
 DRAWN BY: SM
 CHECKED BY: BW
 DATE: 3/17/2021
 REVISED: 3/18/2021

TEST PIT LOG IT-5
 7600 Linglestown Road
 West Hanover Township,
 Dauphin County, Pennsylvania

PLOTTED: 03/29/2021 03:04 PM BY: BWildasin

Date Begin - End: 3/11/2021 **Excavation Company:** John W. Gleim, Jr. Excavation inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 55°F Clear

TEST PIT LOG IT-6

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION		LABORATORY RESULTS							
			Lithologic Description		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)
			Latitude: 40.35641° N Longitude: -76.73977° E Approximate Ground Surface Elevation (ft.): 580.00 Surface Condition: Sparse Vegetation									
			Topsoil: 6" brown organic soil Stratum I 579.5 Well-Graded GRAVEL with Silt and Sand (GW): medium to coarse-grained, subangular, low plasticity, dark reddish brown, moist to dry, homogeneous, weakly cemented									
575	5											
570	10											
565	15		568.0 The test pit was terminated at approximately 12 ft. below ground surface. The test pit was backfilled with excavated material on March 11, 2021.		GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An iPad integrated GPS unit was used to locate the exploration with an accuracy of 4 meters.							

PROJECT NUMBER: 01900271.003A
 OFFICE FILTER: MECHANICSBURG
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB []_KLF_BORING/TEST PIT SOIL LOG






PROJECT NO.: 01900271
 DRAWN BY: SM
 CHECKED BY: BW
 DATE: 3/17/2021
 REVISED: 3/18/2021


TEST PIT LOG IT-6
 7600 Linglestown Road
 West Hanover Township,
 Dauphin County, Pennsylvania

PLOTTED: 03/29/2021 03:04 PM BY: BWildasin

Date Begin - End:	3/11/2021	Excavation Company:	John W. Gleim, Jr. Excavating inc.	TEST PIT LOG IT-7
Logged By:	S. Martorelli	Excavation Crew:	D. Deatrich	
Hor.-Vert. Datum:	WGS 1984 - Not Available	Excavation Equip.:	John Deere 130G Excavator	
Plunge:	-90 degrees	Excav. Dimensions:	ft	
Weather:	55°F Clear			




Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS						
			Latitude: 40.35655° N Longitude: -76.73901° E Approximate Ground Surface Elevation (ft.): 580.00 Surface Condition: Grass		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
			Lithologic Description										
			Topsoil: 6" brown organic soil										
			Stratum I 579.5										
			Well-Graded GRAVEL with Silt and Sand (GW): medium to coarse-grained, subangular, low plasticity, reddish brown to reddish yellow, moist to dry, blocky, weakly cemented, iron oxide staining, Cobble to Boulder size rock throughout										
575	5												
570	10												
565	15												
568.0					<p>The test pit was terminated at approximately 12 ft. below ground surface. The test pit was backfilled with excavated material on March 11, 2021.</p> <p>GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion.</p> <p>GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An iPad integrated GPS unit was used to locate the exploration with an accuracy of 0 meters.</p>								

GINT FILE: KLF_gint_master_non_klf
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB [_KLF_BORING/TEST PIT SOIL LOG]
 OFFICE FILTER: MECHANICSBURG
 PROJECT NUMBER: 01900271.003A


 KLEINFELDER <i>Bright People. Right Solutions.</i>	PROJECT NO.: 01900271	TEST PIT LOG IT-7	
	DRAWN BY: SM CHECKED BY: BW DATE: 3/17/2021 REVISED: 3/18/2021	7600 Linglestown Road West Hanover Township, Dauphin County, Pennsylvania	

PLOTTED: 03/29/2021 03:04 PM BY: BWildasin

Date Begin - End:	3/11/2021	Excavation Company:	John W. Gleim, Jr. Excavating inc.	TEST PIT LOG IT-8
Logged By:	S. Martorelli	Excavation Crew:	D. Deatrich	
Hor.-Vert. Datum:	WGS 1984 - Not Available	Excavation Equip.:	John Deere 130G Excavator	
Plunge:	-90 degrees	Excav. Dimensions:	ft	
Weather:	55°F Clear			

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS									
			Latitude: 40.35641° N Longitude: -76.73921° E Approximate Ground Surface Elevation (ft.): 580.00 Surface Condition: Grass		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks			
			Lithologic Description													
			Topsoil: 6" brown organic soil													
			Stratum I 579.5 Well-Graded GRAVEL with Silt and Sand (GW): coarse-grained, subangular, low plasticity, reddish brown multicolored reddish yellow, moist to dry, blocky, weakly cemented, iron oxide staining, Cobble to Boulder size rock throughout													
575	5															
570	10															
565	15															
			568.0													
			The test pit was terminated at approximately 12 ft. below ground surface. The test pit was backfilled with excavated material on March 11, 2021.				GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An iPad integrated GPS unit was used to locate the exploration with an accuracy of 5 meters.									

GINT FILE: KLF_gint_master_non_klf PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB _KLF_BORING\TEST PIT SOIL LOG

 KLEINFELDER <i>Bright People. Right Solutions.</i>	PROJECT NO.: 01900271	TEST PIT LOG IT-8	
	DRAWN BY: SM CHECKED BY: BW DATE: 3/17/2021 REVISED: 3/18/2021	7600 Linglestown Road West Hanover Township, Dauphin County, Pennsylvania	

PLOTTED: 03/29/2021 03:04 PM BY: BWildasin

Date Begin - End: 3/11/2021 **Excavation Company:** John W. Gleim, Jr. Excavating inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 50°F Clear

TEST PIT LOG IT-9

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION		LABORATORY RESULTS								
			Lithologic Description		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
			<p>Latitude: 40.35595° N Longitude: -76.73838° E Approximate Ground Surface Elevation (ft.): 542.00 Surface Condition: Grass</p>										
			<p>Topsoil: 12" brown organic soil</p>										
540			<p>Stratum I 541.0 Well-Graded GRAVEL with Silt and Sand (GW): medium to coarse-grained, subangular, low plasticity to medium plasticity, dark reddish brown, moist to wet, blocky, weakly cemented</p>										
535													
10			<p>532.0 The test pit was terminated because of excavator refusal (↑) at approximately 10 ft. below ground surface on bedrock. The test pit was backfilled with excavated material on March 11, 2021.</p>										
530													
15													
525													

GROUNDWATER LEVEL INFORMATION:
 ☒ Perched groundwater was observed at approximately 3 ft. below ground surface during excavation.
 ☒ Perched groundwater was observed at approximately 6.5 ft. below ground surface during excavation.
GENERAL NOTES:
 The exploration location and elevation are approximate and were estimated by Kleinfelder.
 An iPad integrated GPS unit was used to locate the exploration with an accuracy of 0 meters.

PROJECT NUMBER: 01900271.003A
 OFFICE FILTER: MECHANICSBURG
 GINT FILE: KLF_gint_master_non_klf
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB []_KLF_BORING/TEST PIT SOIL LOG




PROJECT NO.: 01900271
 DRAWN BY: SM
 CHECKED BY: BW
 DATE: 3/17/2021
 REVISED: 3/18/2021

TEST PIT LOG IT-9
 7600 Linglestown Road
 West Hanover Township,
 Dauphin County, Pennsylvania

PLOTTED: 03/29/2021 03:04 PM BY: BWildasin

Date Begin - End: 3/11/2021 **Excavation Company:** Joh W. Gleim, Jr. Excavating inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 45°F Clear

TEST PIT LOG IT-10

Approximate Elevation (feet) Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS					Additional Tests/ Remarks			
		Latitude: 40.35585° N Longitude: -76.73892° E Approximate Ground Surface Elevation (ft.): 542.00 Surface Condition: Grass				Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)		Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)
		Lithologic Description												
540		Topsoil: 8" brown organic soil Stratum I 541.3 Well-Graded GRAVEL with Silt and Sand (GW): medium to coarse-grained, subangular, low plasticity to medium plasticity, dark reddish brown, moist to wet, homogeneous, weakly cemented, trace sand												
535														
530		10 The test pit was terminated because of excavator refusal (↑) at approximately 10 ft. below ground surface on bedrock. The test pit was backfilled with excavated material on March 11, 2021.												
525														

GROUNDWATER LEVEL INFORMATION:
 Perched groundwater was observed at approximately 3 ft. below ground surface during excavation.
 Perched groundwater was observed at approximately 6.5 ft. below ground surface during excavation.
GENERAL NOTES:
 The exploration location and elevation are approximate and were estimated by Kleinfelder.
 An ipad integrated GPS unit was used to locate the exploration with an accuracy of 3 meters.

PROJECT NUMBER: 01900271.003A
 OFFICE FILTER: MECHANICSBURG
 GINT FILE: KLF_gint_master_non_klf
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB [_KLF_BORING/TEST PIT SOIL LOG]



PROJECT NO.: 01900271
 DRAWN BY: SM
 CHECKED BY: BW
 DATE: 3/17/2021
 REVISED: 3/18/2021

TEST PIT LOG IT-10

 7600 Linglestown Road
 West Hanover Township,
 Dauphin County, Pennsylvania

PLOTTED: 03/29/2021 03:05 PM BY: BWildasin

Date Begin - End: 3/11/2021 **Excavation Company:** John W. Gleim, Jr. Excavating inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 45°F Clear

TEST PIT LOG IT-11

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS							
			Latitude: 40.35563° N Longitude: -76.73914° E Approximate Ground Surface Elevation (ft.): 538.00 Surface Condition: Grass		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks	
Lithologic Description														
			Topsoil: 8" brown organic soil											
535			Stratum I 537.3 Well-Graded GRAVEL with Sand (GW): medium to coarse-grained, subangular, low plasticity to medium plasticity, dark reddish brown, moist to wet, homogeneous, weakly cemented, trace sand											
530			The test pit was terminated at approximately 8 ft. below ground surface. The test pit was backfilled with excavated material on March 11, 2021.		GROUNDWATER LEVEL INFORMATION: <input checked="" type="checkbox"/> Perched groundwater was observed at approximately 2 ft. below ground surface during excavation. <input checked="" type="checkbox"/> Groundwater was observed at approximately 7 ft. below ground surface during excavation. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An ipad integrated GPS unit was used to locate the exploration with an accuracy of 0 meters.									

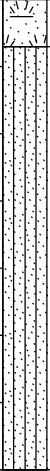
PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT FILE: KLF_gint_master_non_klf GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB _KLF_BORING\TEST PIT SOIL LOG

	PROJECT NO.: 01900271	TEST PIT LOG IT-11 7600 Linglestown Road West Hanover Township, Dauphin County, Pennsylvania
	DRAWN BY: SM CHECKED BY: BW DATE: 3/17/2021 REVISED: 3/18/2021	

PLOTTED: 03/29/2021 03:05 PM BY: BWildasin

Date Begin - End: 3/11/2021 **Excavation Company:** John W. Gleim, Jr. Excavating
Logged By: S. Martorelli **Excavation Crew:** D. Deatrach
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 45°F Clear

TEST PIT LOG IT-12

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS							
			Latitude: 40.35562° N Longitude: -76.73855° E Approximate Ground Surface Elevation (ft.): 537.00 Surface Condition: Grass		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks	
Lithologic Description														
			Topsoil: 8" brown organic soil											
535			Stratum II 536.3 Silty SAND (SM): subangular, low plasticity to medium plasticity, dark reddish brown, moist to wet, homogeneous											
530			530.0											
			The test pit was terminated at approximately 7 ft. below ground surface. The test pit was backfilled with excavated material on March 11, 2021.				GROUNDWATER LEVEL INFORMATION: <input checked="" type="checkbox"/> Perched groundwater was observed at approximately 2.5 ft. below ground surface during excavation. <input checked="" type="checkbox"/> Groundwater was observed at approximately 6.5 ft. below ground surface during excavation. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An ipad integrated GPS unit was used to locate the exploration with an accuracy of 0 meters.							
10														
525														
15														
520														

PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT FILE: KLF_gint_master_non_klf GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB [_KLF_BORING/TEST PIT SOIL LOG]



PROJECT NO.: 01900271
 DRAWN BY: SM
 CHECKED BY: BW
 DATE: 3/17/2021
 REVISED: 3/18/2021

TEST PIT LOG IT-12

7600 Linglestown Road
 West Hanover Township,
 Dauphin County, Pennsylvania

PLOTTED: 03/29/2021 03:05 PM BY: BWildasin

Date Begin - End: 3/11/2021 **Excavation Company:** John W. Gleim, Jr. Excavating inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 45°F Clear

TEST PIT LOG IT-13

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS									
			Latitude: 40.35568° N Longitude: -76.73817° E Approximate Ground Surface Elevation (ft.): 536.00 Surface Condition: Grass				Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks	
			Lithologic Description													
			Topsoil: 8" brown organic soil													
535			Stratum II Silty SAND (SM): subangular, low plasticity to medium plasticity, dark reddish brown, moist to wet, homogeneous													Perched Water at 2.5 Feet
	5															
530																
			The test pit was terminated at approximately 6 ft. below ground surface. The test pit was backfilled with excavated material on March 11, 2021.				GROUNDWATER LEVEL INFORMATION: <input checked="" type="checkbox"/> Perched groundwater was observed at approximately 2.5 ft. below ground surface during excavation. <input checked="" type="checkbox"/> Groundwater was observed at approximately 6 ft. below ground surface during excavation. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An ipad integrated GPS unit was used to locate the exploration with an accuracy of 0 meters.									
	10															
	15															
	520															


GINT FILE: KLF_gint_master_non_klf PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB KLF_BORING/TEST PIT SOIL LOG

<p>KLEINFELDER Bright People. Right Solutions.</p>	PROJECT NO.: 01900271	TEST PIT LOG IT-13	
	DRAWN BY: SM CHECKED BY: BW DATE: 3/17/2021 REVISED: 3/18/2021	7600 Linglestown Road West Hanover Township, Dauphin County, Pennsylvania	

PLOTTED: 03/29/2021 03:05 PM BY: BWildasin

Date Begin - End: 3/11/2021 **Excavation Company:** John W. Gleim, Jr. Excavation inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrach
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 65°F Clear

TEST PIT LOG IT-14

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS						
			Lithologic Description		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
555			Stratum I Well-Graded GRAVEL with Sand (GW): coarse-grained, subangular, reddish brown, dry to moist, homogeneous, weakly to moderately cemented, weathered bedrock from surface										
			The test pit was terminated because of excavator refusal (↑) at approximately 3 ft. below ground surface on bedrock. The test pit was backfilled with excavated material on March 11, 2021.				GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An iPad integrated GPS unit was used to locate the exploration with an accuracy of 8 meters.						

PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB KLF_BORING/TEST PIT SOIL LOG



PROJECT NO.: 01900271
 DRAWN BY: SM
 CHECKED BY: BW
 DATE: 3/17/2021
 REVISED: 3/18/2021


TEST PIT LOG IT-14

7600 Linglestown Road
 West Hanover Township,
 Dauphin County, Pennsylvania


PLOTTED: 03/29/2021 03:05 PM BY: BWildasin

Date Begin - End: 3/11/2021 **Excavation Company:** John W. Gleim, Jr. Excavation inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 68°F Clear

TEST PIT LOG IT-15

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Latitude: 40.35617° N Longitude: -76.73599° E Approximate Ground Surface Elevation (ft.): 559.00 Surface Condition: Sparse Vegetation		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks		
Lithologic Description															
			Stratum I Well-Graded GRAVEL with Sand (GW): coarse-grained, subangular, reddish brown, dry to moist, homogeneous, weakly to moderately cemented, weathered bedrock from surface												
			The test pit was terminated because of excavator refusal (↑) at approximately 1.5 ft. below ground surface on bedrock. The test pit was backfilled with excavated material on March 11, 2021.				GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An ipad integrated GPS unit was used to locate the exploration with an accuracy of 65 meters.								
555	5														
550	10														
545	15														
540															


PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT FILE: KLF_gint_master_non_klf GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB _KLF_BORING\TEST PIT SOIL LOG

	PROJECT NO.: 01900271	TEST PIT LOG IT-15 7600 Linglestown Road West Hanover Township, Dauphin County, Pennsylvania
	DRAWN BY: SM CHECKED BY: BW DATE: 3/17/2021 REVISED: 3/18/2021	

PLOTTED: 03/29/2021 03:05 PM BY: BWildasin

Date Begin - End: 3/11/2021 **Excavation Company:** John W. Gleim, Jr. Excavation inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 70°F Clear

TEST PIT LOG IT-16

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS					
			Latitude: 40.35620° N Longitude: -76.73561° E Approximate Ground Surface Elevation (ft.): 560.00 Surface Condition: Sparse Vegetation		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)
Lithologic Description												
		 <p>Stratum I Well-Graded GRAVEL with Sand (GW): coarse-grained, subangular, reddish brown, dry to moist, blocky, weakly to moderately cemented, weathered bedrock from surface</p>										
		<p>The test pit was terminated because of excavator refusal (↑) at approximately 1 ft. below ground surface on bedrock. The test pit was backfilled with excavated material on March 11, 2021.</p>										
		<p>GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion.</p> <p>GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An ipad integrated GPS unit was used to locate the exploration with an accuracy of 0 meters.</p>										
555	5											
550	10											
545	15											

PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
PROJECT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB KLF_BORING/TEST PIT SOIL LOG




PROJECT NO.: 01900271
DRAWN BY: SM
CHECKED BY: BW
DATE: 3/17/2021
REVISED: 3/18/2021


TEST PIT LOG IT-16

7600 Linglestown Road
West Hanover Township,
Dauphin County, Pennsylvania

Date Begin - End: 3/11/2021 **Excavation Company:** John W. Gleim, Jr. Excavation inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 70°F Clear

TEST PIT LOG IT-17

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS						
			Lithologic Description		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
			Latitude: 40.35631° N Longitude: -76.73498° E Approximate Ground Surface Elevation (ft.): 557.00 Surface Condition: Sparse Vegetation										
			Topsoil: 6" brown organic soil										
			Stratum I		556.5								
			Well-Graded GRAVEL with Silt and Sand (GW): coarse-grained, subangular, low plasticity, reddish brown, moist, blocky, weakly cemented										
555					554.0								
			The test pit was terminated because of excavator refusal (↑) at approximately 3 ft. below ground surface on bedrock. The test pit was backfilled with excavated material on March 11, 2021.				GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An iPad integrated GPS unit was used to locate the exploration with an accuracy of 0 meters.						
5													
550													
545													
10													
540													
15													

 KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 01900271 DRAWN BY: SM CHECKED BY: BW DATE: 3/17/2021 REVISED: 3/18/2021	TEST PIT LOG IT-17
	7600 Linglestown Road West Hanover Township, Dauphin County, Pennsylvania	

PLOTTED: 03/29/2021 03:05 PM BY: BWildasin

Date Begin - End: 3/12/2021 **Excavation Company:** John W. Gleim, Jr. Excavating inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 55°F Partly Cloudy

TEST PIT LOG IT-18

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS					
			Lithologic Description		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)
555			Stratum I Well-Graded GRAVEL with Silt and Sand (GW): medium to coarse-grained, subangular, low plasticity, reddish brown, moist to dry, blocky, weakly cemented, iron oxide staining									
553.0			The test pit was terminated at approximately 4 ft. below ground surface. The test pit was backfilled with excavated material on March 12, 2021.				GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An ipad integrated GPS unit was used to locate the exploration with an accuracy of 4 meters.					
5												
550												
10												
545												
15												
540												

PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT FILE: KLF_gint_master_non_klf GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB KLF_BORING/TEST PIT SOIL LOG

	PROJECT NO.: 01900271 DRAWN BY: SM CHECKED BY: BW DATE: 3/17/2021 REVISED: 3/18/2021	TEST PIT LOG IT-18	7600 Linglestown Road West Hanover Township, Dauphin County, Pennsylvania

PLOTTED: 03/29/2021 03:05 PM BY: BWildasin

Date Begin - End: 3/12/2021 **Excavation Company:** John W. Gleim, Jr. Excavating inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 60°F Partly Cloudy

TEST PIT LOG IT-19

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS						
			Lithologic Description		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
550			Stratum I Well-Graded GRAVEL with Silt and Sand (GW): coarse-grained, subangular, low plasticity to non-plastic, reddish brown to brown, dry, blocky, moderately to weakly cemented, iron oxide staining										
	5		The test pit was terminated because of excavator refusal (↑) at approximately 3.5 ft. below ground surface on bedrock. The test pit was backfilled with excavated material on March 12, 2021.				GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during excavation or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An ipad integrated GPS unit was used to locate the exploration with an accuracy of 4 meters.						
545													
540													
535													

PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT FILE: KLF_gint_master_non_klf GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB _KLF_BORING\TEST PIT SOIL LOG

	PROJECT NO.: 01900271	TEST PIT LOG IT-19 7600 Linglestown Road West Hanover Township, Dauphin County, Pennsylvania
	DRAWN BY: SM CHECKED BY: BW DATE: 3/17/2021 REVISED: 3/18/2021	

PLOTTED: 03/29/2021 03:05 PM BY: BWildasin

Date Begin - End: 3/12/2021 **Excavation Company:** John W. Gleim, Jr. Excavating inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 60°F Partly Cloudy

TEST PIT LOG IT-20

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS						
			Lithologic Description		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
			<p>Topsoil: 12" brown organic soil</p> <p>Stratum II 539.0 Silty SAND (SM): medium to coarse-grained, subrounded, low plasticity, light brown to yellowish brown, moist, homogeneous, weakly cemented, trace gravel</p>										
535	5												
530	10		<p>The test pit was terminated at approximately 7 ft. below ground surface. The test pit was backfilled with excavated material on March 12, 2021.</p>		<p>GROUNDWATER LEVEL INFORMATION: Groundwater was observed at approximately 7 ft. below ground surface during excavation.</p> <p>GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An iPad integrated GPS unit was used to locate the exploration with an accuracy of 0 meters.</p>								
525	15												

PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB GINT FILE: KLF_gint_master_non_klf

	PROJECT NO.: 01900271 DRAWN BY: SM CHECKED BY: BW DATE: 3/17/2021 REVISED: 3/18/2021	TEST PIT LOG IT-20	7600 Linglestown Road West Hanover Township, Dauphin County, Pennsylvania

PLOTTED: 03/29/2021 03:05 PM BY: BWildasin

Date Begin - End: 3/12/2021 **Excavation Company:** John W. Gleim, Jr. Excavating inc.
Logged By: S. Martorelli **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: WGS 1984 - Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: -90 degrees **Excav. Dimensions:** ft
Weather: 63°F Partly Cloudy

TEST PIT LOG IT-21

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION		LABORATORY RESULTS								
			Lithologic Description		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
			<p>Topsoil: 16" brown organic soil</p>										
			<p>Stratum II 543.7 Silty SAND (SM): medium-grained, subrounded, low plasticity, light brown to yellowish brown, moist, homogeneous, weakly cemented</p>										
540	5												
535	10												
530	15		<p>532.0 The test pit was terminated at approximately 13 ft. below ground surface. The test pit was backfilled with excavated material on March 12, 2021.</p>		<p>GROUNDWATER LEVEL INFORMATION: ∇ Groundwater was observed at approximately 12.5 ft. below ground surface during excavation. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder. An ipad integrated GPS unit was used to locate the exploration with an accuracy of 5 meters.</p>								

PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT FILE: KLF_gint_master_non_klf GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB _KLF_BORING\TEST PIT SOIL LOG



PROJECT NO.: 01900271
 DRAWN BY: SM
 CHECKED BY: BW
 DATE: 3/17/2021
 REVISED: 3/18/2021




TEST PIT LOG IT-21

7600 Linglestown Road
 West Hanover Township,
 Dauphin County, Pennsylvania

PLOTTED: 03/29/2021 03:05 PM BY: BWildasin

Date Begin - End: 3/15/2021 **Excavation Company:** John W. Gleim, Jr. Excavating inc.
Logged By: B. Wildasin **Excavation Crew:** D. Deatrich
Hor.-Vert. Datum: Not Available **Excavation Equip.:** John Deere 130G Excavator
Plunge: N/A degrees **Excav. Dimensions:** ft
Weather: 50°F Clear

TEST PIT LOG IT-22

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS					
			Approximate Ground Surface Elevation (ft.): 563.00 Surface Condition: Sparse Vegetation		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)
Lithologic Description												
			14" Dark brown organic soil									
			Stratum II Silty SAND (SM): reddish brown, moist	561.8								Infiltration Test Conducted at 1.2 Feet
560			Stratum I Well-Graded GRAVEL with Silt and Sand (GW): tan to gray, moist to wet, with Cobble-sized rock fragments, mottled	559.0								Groundwater Encountered at 5.5 Feet
	5			557.0								
			The test pit was terminated at approximately 6 ft. below ground surface. The test pit was backfilled with excavated material on March 15, 2021.				GROUNDWATER LEVEL INFORMATION:  Groundwater was observed at approximately 5.5 ft. below ground surface during excavation. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.					
	5											
	10											
	5											
	15											
	5											
	5											

PROJECT NUMBER: 01900271.003A OFFICE FILTER: MECHANICSBURG
 GINT FILE: KLF_gint_master_non_klf GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_NON_KLF.GLB _KLF_BORING\TEST PIT SOIL LOG



PROJECT NO.: 01900271
 DRAWN BY: DT
 CHECKED BY: BW
 DATE: 3/17/2021
 REVISED: 3/18/2021

TEST PIT LOG IT-22

7600 Linglestown Road
 West Hanover Township,
 Dauphin County, Pennsylvania