## **LEGEND – BORING LOG TERMINOLOGY**

Explanation of each column, progressing from left to right

- 1. Depth (in feet) refers to distance below the ground surface.
- 2. Elevation (in feet) is referenced to mean sea level, unless otherwise noted.
- 3. Standard Penetration (N) the number of blows required to drive a 2-inch O.D., 1-3/8 inch I.D., split-barrel sampler, using a 140-pound hammer with a 30-inch free fall. The blows are recorded in 6-inch drive increments. Standard penetration resistance is determined from the total number of blows required for one foot of penetration by summing the second and third 6-inch increments of an 18-inch drive.

50/n – indicates number of blows (50) to drive a split-barrel sampler a certain number of inches (n) other than the normal 6-inch increment.

- 4. The length of the sampler drive is indicated graphically by horizontal lines across the "Standard Penetration" and "Recovery" columns.
- 5. Sample recovery from each drive is indicated numerically in the column headed "Recovery".
- 6. The drive sample location is designated by the heavy vertical bar in the "Sample No., Drive" column.
- 7. The length of hydraulically pressed "Undisturbed" samples is indicated graphically by horizontal lines across the "Press" column.
- 8. Sample numbers are designated consecutively, increasing in depth.
- 9. Soil Description
  - a. The following terms are used to describe the relative compactness and consistency of soils:

Granular Soils – Compactness

	Blows/Foot
Term	Standard Penetration
Very Loose	less than 5
Loose	5 – 10
Medium Dense	11 – 30
Dense	31 – 50
Very Dense	over 50

Cohesive Soils - Consistency

	Unconfined Compression	Blows/Foot Standard	
<u>Term</u>	tons/sq.ft.	<b>Penetration</b>	Hand Manipulation
Very Soft	less than 0.25	less than 2	Easily penetrated 2-in. by fist
Soft	0.25 - 0.50	2 – 4	Easily penetrated 2-in. by thumb
Medium Stiff	0.50 - 1.0	5 – 8	Penetrated by thumb with moderate effort
Stiff	1.0 – 2.0	9 – 15	Readily indented by thumb but not penetrated
Very Stiff	2.0 - 4.0	16 – 30	Readily indented by thumbnail
Hard	over 4.0	over 30	Indented with difficulty by thumbnail

- b. Color If a soil is a uniform color throughout, the term is single, modified by such adjective as light and dark. If the predominant color is shaded by a secondary color, the secondary color precedes the primary color. If two major and distinct colors are swirled throughout the soil, the colors are modified by the term "mottled".
- c. Texture is based on the Ohio Department of Transportation Classification System. Soil particle size definitions are as follows:

Description	Size	Description	Size							
Boulders	Larger than 12"	Sand – Coarse	2.0 mm to 0.42 mm							
Cobbles	12" to 3"	– Fine	0.42 mm to 0.074 mm							
Gravel – Coarse	3" to ¾"	Silt	0.074 mm to 0.005 mm							
– Fine	¾" to 2.0 mm	Clay	smaller than 0.005 mm							

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- d. The main soil component is listed first. The minor components are listed in order of decreasing percentage of particle size.
- e. Modifiers to main soil descriptions are indicated as a percentage by weight of particle sizes.

trace	0 to 10%
little	10 to 20%
some	20 to 35%
"and"	35 to 50%

g.

Damp Moist

Wet

f. Moisture content of **cohesionless soils** (sands and gravels) is described as follows:

Moisture content below plastic limit

Moisture content near or above liquid limit

Moisture content above plastic limit to -3% liquid limit

Term	Relative Moisture or Appearance
Dry Damp Moist Wet	Soil leaves no moisture when pressed between fingers Soil leaves very little moisture when pressed between fingers. Soil leaves small amount of moisture when pressed between fingers. The pore space is filled with water and water can be poured from sample with ease.
The moisture content	of <b>cohesive soils</b> (silts and clays) is expressed relative to plastic properties.
Term	Relative Moisture or Appearance
Drv	Brittle to powdery: Moisture content well below plastic limit

## 10. Rock Hardness and Rock Quality Designation

a. The following terms are used to describe the relative strength of the **bedrock**.

<u>Term</u>	Description
Very Weak	Core can be carved with a knife and scratched by fingernail. Can be excavated readily with a point of a pick. Pieces 1-inch or more in thickness can be broken by finger pressure.
Weak	Core can be grooved or gouged readily by a knife or pick. Can be excavated in small fragments by moderate blows of a pick point. Small, thin pieces can be broken by finger pressure.
Slightly Strong	Core can be grooved or gouged 0.05 inch deep by firm pressure of a knife or pick point. Can be excavated in small chips to pieces about 1-inch maximum size by hard blows of the point of a geologist's pick.
Moderately Strong	Core can be scratched with a knife or pick. Grooves or gouges to $\frac{1}{4}$ " deep can be excavated by hand blows of a geologist's pick. Requires moderate hammer blows to detach hand specimen.
Strong	Core can be scratched with a knife or pick only with difficulty. Requires hard hammer blows to detach hand specimen. Sharp and resistant edges are present on hand specimen.
Very Strong	Core cannot be scratched by a knife or sharp pick. Breaking of hand specimens requires hard repeated blows of the geologist hammer.
Extremely Strong	Core cannot be scratched by a knife or sharp pick. Chipping of hand specimens requires hard repeated blows of the geologist hammer.

- b. Rock Quality Designation, RQD This value is expressed in percent and is an indirect measure of rock soundness. It is obtained by summing the total length of all core pieces which are at least four inches long, and then dividing this sum by the total length of the core run.
- 11. Gradation when tests are performed, the percentage of each particle size is listed in the appropriate column (defined in Item 9c).
- 12. When a test is performed to determine the natural moisture content, liquid limit moisture content, or plastic limit moisture content, the moisture content is indicated in tabular form.

13. The corrected standard penetration (N<sub>60</sub>) value in blows per foot is indicated in tabular form.

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	PROJECT: CUY-90-18.22/VAR TYPE: LANDSLIDE	DRILLING FIRM / OPER SAMPLING FIRM / LOG	ATOR: DL2 GER: DL2	Image: Contract C							02 STATION / OFFSET: <u>44+56, 100' LT.</u> ALIGNMENT: <u>CUY-480-16.28</u> EXPLORATION B-001-0											
.R.GP	PID: 92069 SFN:	DRILLING METHOD:	3.	.25" HSA	CALIBRATION DATE: 9/8/16								0.2 ft.	PAGE 1 OF 2								
2-V⊅	STARTEND	SAMPLING METHOD.										<u>, sosi</u>	1.53/	7 IN,	2195	<u> </u>						
0-182:	MATERIAL DESCRIPTI AND NOTES	ON	717.2	DEPTHS	SP1/ RQD	N <sub>60</sub>	REC (%)	ID	(tsf)	GR		FS	IN (% SI	) CL		PL	PI	wc	ODOT CLASS (GI)	FILL		
:UY-9	FILL: Loose light brown GRAVEL WITH SAND	0 (A-1-b); dry. a∽																				
1001 C			0 715.2		1 2	8	83	SS-1	-	-	-	-	-	-	-	-	-	6	A-1-b (V)			
21-30	FILL: Hard brown SANDY SILT (A-4a), trace g	ravel; damp.		- 3 -	4															-		
001\18				- 4 -	2 5	19	67	SS-2	4.5+		_	_	_	_	_	_	_	11	A-4a (V)			
21\301				- 5 -	9		0.		1.0											-		
CTS\18	FILL: Loose brown SANDY SILT (A-4a); damp		/11.2	- 6 -	2	7	22	<u> </u>										10	A 40 () ()	1		
ROJEC				- 7 -	<u> </u>	'	22	55-3	-	-	-	-	-	-	-	-	-	12	A-4a (V)	-		
<b>CHNPI</b>	FILL: Stiff to very stiff gray SILT (A-4b), some	clay, trace fine to	708.7		2															-		
<b>JEOTE</b>	coarse sand, trace gravel; damp to moist.	*** +++ +++	• + • + • +	- 10 -	5	16	-	SS-4	1.75	-	-	-	-	-	-	-	-	15	A-4b (V)			
-INE/C		+ + + + + + + + + + + + + + + + + + + +	- + - + - +	- 11 -	4																	
ISCIPI	SS-5 contains piece of glass.	+++++++++++++++++++++++++++++++++++++++	· + · +	- 12 -	1 4 5	12	50	SS-5	2.25	2	2	6	62	28	23	18	5	16	A-4b (8)			
RED/D		· + · + · +	- 13 -																			
:\SHA		+++++++++++++++++++++++++++++++++++++++	· + · + · +	- 14 -	3 5_	16	78	SS-6	3.25	-	-	-	-	-	-	-	-	16	A-4b (V)			
::58 - X		+++++++++++++++++++++++++++++++++++++++	· + · +	- 15 -																-		
3/20 13		+ + + + + + + + + + + +	· + · + · +	- 16 -	3 4	15	50	SS-7	3.25	-	_	-	-	_	_	_	-	15	A-4b (V)			
- 11/13		+++++++++++++++++++++++++++++++++++++++	· + · + · +		7														( )	-		
T.GDT	@ 18.5' - 21.0'; hard.	+++++++++++++++++++++++++++++++++++++++	· + · + · +	- 19 -	5 7	21	56	55-8	4 5+	1	2	7	52	38	26	17	a	14	Δ_4h (8)	1		
OD HO		+ + + + + + + + + + + +	· + · + · +	- 20 -	9	21	50	00-0	4.01		2		52		20	11			7-46 (0)	-		
11) - C	FILL: Medium dense grav SILT (A-4b). little cla	av. little fine sand:	696.2	- 21 -	6															-		
8.5 X 1	damp.	+++ +++ +++	• +	- 22 -	12 12	32	89	SS-9	-	-	-	-	-	-	-	-	-	13	A-4b (V)			
.0G (		+++++++++++++++++++++++++++++++++++++++	693.7	- 23 -	0															-		
RING I	FILL: Hard gray SILT AND CLAY (A-6a), little t contains concrete fragment; damp.	fine to coarse sand;		- 24 -	2 5 11	21	89	SS-10	4.5+	-	-	-	-	-	-	-	-	13	A-6a (V)			
DIL BO			691.2	- 25 -																		
OT SC	FILL: Very dense gray GRAVEL WITH SAND contains asphalt fragment; damp.	AND SILT (A-2-4);	d d	20	50/5"	-	60	SS-11		-	-	-	-	-	-	-	-	12	A-2-4 (V)			
RD OD				- 28 -																		
STANDAF	POSSIBLE FILL: Very stiff gray SANDY SILT contains piece of wood; damp to moist.	(A-4a), trace gravel;	000.7	- 29 -	2 2 4	8	56	SS-12	3.75	-	-	-	-	-	-	-	-	14	A-4a (V)	-		

Γ	PID: 92069	SFN:	PROJECT:	CUY-90	-18.22/VAF	2/VAR STA		OFFSE	T:	44+56	, 100' LT.	S	START: 7/23/18				ND:	7/2	3/18	_ P	G 2 OF	2 B-00	1-0-18
2		MATERIAL DESCRIP	TION		ELEV.		110	SPT/	N	REC	SAMPLE	HP	(	GRAD	ATIO	N (%	) )	ATT	ERBE	ERG		ODOT	BACK
ЧĊ.		AND NOTES			687.2	DEPT	пэ	RQD	IN <sub>60</sub>	(%)	ID	(tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	CLASS (GI)	FILL
-VAI	POSSIBLE FILL	: Very stiff gray SANDY SIL	T (A-4a), trace gra	vel;																			
1822	SS-13 and SS-1	14 contain roots.	unueu)				- 31 -	3 _	20	00	CC 12	2.05									10	A 40 () ()	
-96-							32	5 10	20	09	33-13	3.25	-	-	-	-	-	-	-	-	19	A-4a (V)	
G							- 33																
1001							- 34 -	5_	01		00.44				4.5	40	07		4-	_	40		
1-301							- 05	9	21	89	SS-14	-	1	4	15	43	37	26	1/	9	19	A-4a (8)	
/182					681.2		- 35 -																
1001	Hard brown SIL	TY CLAY (A-6b), trace to little	e fine to coarse sa	nd;	001.2		<sup>36</sup> T	5															
1/30	damp.						- 37 -	9 12	28	89	SS-15	-	-	-	-	-	-	-	-	-	13	A-6b (V)	
\182							- 38 -																
CTS							- 30 -	5															
SOJE								7	27	89	SS-16	4.5+	-	-	-	-	-	-	-	-	16	A-6b (V)	
НРЯ							40 -																
TEC							L 41 T	6															
0E0							- 42 -	10 12	29	89	SS-17	4.5+	-	-	-	-	-	-	-	-	16	A-6b (V)	
NE/					673.7		- 43																
	SHALE. weathe	red. verv weak. grav.			- 073.7	—TR		49 1	\_ <b>-</b> _/	400/	SS-18	~ <b>-</b> ~	- )	-			-		-	-		Rock (V)	
DIS	,	, , , , , , , ,						\ <u>50/0"</u> /															
RED							- 45 -																
SHA							- 46 -	50/4"		100	SS-19	~ <b>-</b> ~			-		-	-	-			Rock (V)	
- X:\							- 47																
3:58							- 48																
/20 1					1			50/4"		100	SS-20	~ <b>-</b> ~	-	-			-	-	-			Rock (V)	
1/13					1		- 49 -																
1-1							_ 50 -																
T.G							- 51 -	50/5"	-	100	SS-21	-	-	-	-		-	-	-	_	_	Rock (V)	
DO							- 52 -																
ġ							- 53 -																
(11)								-50/3" <sub>-</sub> -	\ <u>-</u> /	117/	SS-22	~ <u>-</u> ~		-	_				-			Rock (V)	
8.5 >							- 54 -																
00							55																
ZG L							- 56 -	50/3"	~ <b>-</b> ⁄	133/	SS-23				-		-	-	-			Rock (V)	
ORI							- 57	-															
OIL B							- 58 -																
T SC								-50/3"	<u> </u>	100/	SS-24	<b>-</b> -	-	-	-		-	-	-	-		Rock (V)	
ODO							- 59 -		-														
$ \begin{array}{c} \hline \\ \hline $																							
ND/																							
ST⊭																							
┝	NOTES: NON	E																					
L	ABANDONMEN	IT METHODS, MATERIALS,	QUANTITIES: N	IOT RECO	DRDED																		

	PROJECT: CUY-90-18.22/VAR	DRILLING FIRM / OPERA SAMPLING FIRM / LOGG	DRILL RIG: <u>'16 CME 850-TATV-502</u> HAMMER: <u>CME AUTOMATIC</u>							02 STATION / OFFSET: <u>45+19, 61' LT.</u> EXPLORATION ALIGNMENT: CUY-480-16.28 B-002-0-18											
R.GPJ	PID: 92069 SFN:	DRILLING METHOD:	3.	25" HSA	CALIBRATION DATE: 9/8/16							ATIO	6.8 ft.	PAGE							
¥-	START: <u>//24/18</u> END: <u>//24/18</u> S	SAMPLING METHOD:		SPI	ENEF	RGY R	AIIO	(%):	79.7	<u> </u>	000	RD:	6	3834	1.07	15 N,	2195	04 E			
0-1822	MATERIAL DESCRIPTIO AND NOTES	DN	ELEV. 708.4	DEPTHS	SPT/ RQD	N <sub>60</sub>	REC (%)	SAMPLE ID	HP (tsf)	GR	GRADATION R CS FS			5) CL		ERBI	ERG PI	wc	ODOT CLASS (GI)	BACK FILL	
6-YUC	FILL: Very stiff SILT AND CLAY (A-6a), litte fine	e to coarse sand,																			
301001 0	SS-1 contains roots.			- 2 -	2 4 5	12	33	SS-1	4.00	-	-	-	-	-	-	-	-	16	A-6a (V)		
\1821-3				- 3 -	0															-	
\301001				- 4 - - - 5 -	3 4 6	13	67	SS-2	3.75	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
TS\182	FILL: Medium dense gray SILT (A-4b), little fine	sand, trace clay; ++++	702.4		4															-	
ROJEC	damp.	- + + + + + + + + + + + + + + + +	4 4 4	- 7 -	6 6	16	89	SS-3	-	0	1	4	74	21	23	20	3	16	A-4b (8)	-	
TECHNP	FILL: Very stiff gray SANDY SILT (A-4a), trace	gravel; damp.	699.9	- 9 -	2 4	11	89	SS-4	2 00	_	_	_	_	_		-	_	16	A-4a (V)	-	
E/GEO				- 10 -	4				2.00											-	
ISCIPLIN				11 - 12	3 4 8	16	78	SS-5	4.00	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
ARED\D			694.9	- 13 -	7															-	
'HS\:X - :	Contains rock fragments; damp.	), trace gravel;		14 - 15	6 9	23	89	SS-6	4.5+	-	-	-	-	-	-	-	-	12	A-4a (V)	_	
/20 13:56	SS-7 consists of weathered shale.			- 16 -	4 12	32	80	<u>\$\$-7</u>				_				_		7	A-42 (\/)	-	
- 11/13				- 17 - - - 18	12	02	00	00-1				_	_					,	Α-τά (V)	-	
DOT.GDT				- 19 -	3 3 4	9	72	SS-8	2.25	8	5	12	46	29	26	18	8	14	A-4a (8)	-	
) - OH [			687.4	- 20 -	4															-	
8.5 X 11	Very stiff brown SANDY SILT (A-4a), trace grav damp.	el; contains roots;		- 22 -	2 5	9	89	SS-9	3.50	-	-	-	-	-	-	-	-	16	A-4a (V)		
) LOG (				- 23	16															-	
BORING				- 24 25 -	10 6	21	44	SS-10	2.25	-	-	-	-	-	-	-	-	15	A-4a (V)	-	
DT SOIL	Very stiff gray SILT (A-4b), little fine to coarse sa	and, little clay;	682.4	- 26 -	5 3	9	89	SS-11	2.25	-	-	_	_	-	-	-	_	22	A-4b (V)	_	
RD ODC	containo organico, damp.	+++++++++++++++++++++++++++++++++++++++	679.9	- 27 -	4														- (-)	-	
STANDA	Stiff brown and gray SANDY SILT (A-4a); damp	). (†††††		- - 29 -	2 2 3	7	89	SS-12	1.50	0	2	20	46	32	28	18	10	23	A-4a (8)		

	PID: 92069	PID: <u>92069</u> SFN: PROJECT: <u>CUY-90-</u>								45+19	9, 61' LT.	START: <u>7/24/18</u> END:					7/24	1/18	_   P	g 2 of	2 B-00	2-0-18	
2		MATERIAL DESCRIP	TION		ELEV.		лıс	SPT/	N	REC	SAMPLE	HP GRADATION (%)						ATT	ERBE	ERG		ODOT	BACK
R.G		AND NOTES			678.4			RQD	<b>'™</b> 60	(%)	ID	(tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	CLASS (GI)	FILL
-VAI	Stiff brown and	gray SANDY SILT (A-4a); da	mp. <i>(continued)</i>		677.4																		
822	Medium dense	brown and reddish brown GR	AVEL WITH SAN	), 🕰	5		- 31 -	2															
90-1	SILT, AND CLA	Y (A-2-6); possible decompo	sed shale; damp.	í þ			- 32 -	4	11	89	SS-13	2.25	-	-	-	-	-	-	-	-	19	A-2-6 (V)	
-≻'					1		- 22	4															
01 C					674.9	—_TR—		15															
010(	SHALE, weathe	ered, very weak, gray.					- 34 -	- <u>50/3</u> "_	-	89	SS-14	-	-	-	-	-	-	-	-	-	-	Rock (V)	
21-3							- 35																
1182				三三																			
1001					671.6		- 36 -	43	-	89	SS-15	-	-	-	-	-	-	-	-	_	-	Rock (V)	
\30						EOB-		50/3			00.10											1.000.1(1)	
1821																							
TS																							
JEC																							
RO																							
ΗH																							
ЩЦ																							
9EO																							
NE/O																							
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	NOTES: NON	E																					
	ABANDONMEN	NT METHODS, MATERIALS,	QUANTITIES: N	OT RECO	RDED																		