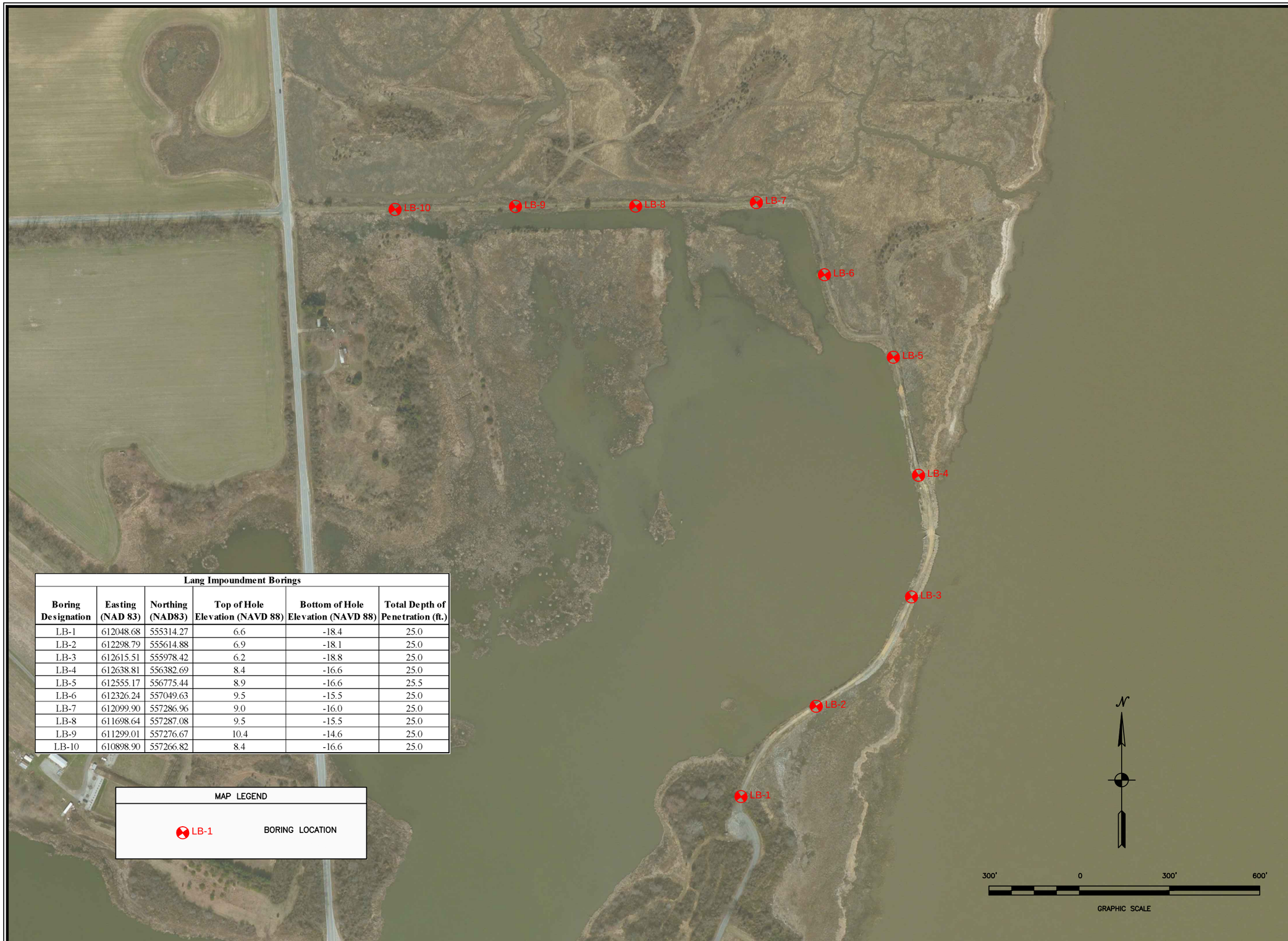


Lang Impoundment Borings

Boring Designation	Easting (NAD 83)	Northing (NAD83)	Top of Hole Elevation (NAVD 88)	Bottom of Hole Elevation (NAVD 88)	Total Depth of Penetration (ft.)
LB-1	612048.68	555314.27	6.6	-18.4	25.0
LB-2	612298.79	555614.88	6.9	-18.1	25.0
LB-3	612615.51	555978.42	6.2	-18.8	25.0
LB-4	612638.81	556382.69	8.4	-16.6	25.0
LB-5	612555.17	556775.44	8.9	-16.6	25.5
LB-6	612326.24	557049.63	9.5	-15.5	25.0
LB-7	612099.90	557286.96	9.0	-16.0	25.0
LB-8	611698.64	557287.08	9.5	-15.5	25.0
LB-9	611299.01	557276.67	10.4	-14.6	25.0
LB-10	610898.90	557266.82	8.4	-16.6	25.0

MAP LEGEND

LB-1 BORING LOCATION

GBA
ENGINEERS ★ SURVEYORS
GAHAGAN & BRYANT ASSOCIATES, INC.
9800-O YELLOW BRICK RD.
BALTIMORE, MD 21237-5608
TEL: 410.682.5595 FAX: 410.682.2175
WWW.GBA-INC.COM

DE CERTIFICATE OF AUTHORIZATION NO. 637

REV	REVISIONS	DATE	APP

NOTES:
1. THE INFORMATION DEPICTED HERE REPRESENTS THE RESULTS OF SURVEYS MADE ON MARCH 01-11, 2016, AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITION EXISTING AT THAT TIME.
2. HORIZONTAL COORDINATES ARE IN U.S. SURVEY FEET AND ARE REFERENCED TO U.S. STATE PLANE DELAWARE, NAD 83.
3. HORIZONTAL POSITIONING WAS OBTAINED USING RTK GPS REFERENCED TO SURVEY MONUMENT "855 1910 K TIDAL".
4. AERIAL IMAGERY WAS OBTAINED FROM BING MAPS AND IS DATED 2007.
5. SCALE IS 1"=300' WHEN PLOTTED AS 17"x11".

DE FISH & WILDLIFE

IMPOUNDMENT IMPROVEMENTS 2015-2016

LANG IMPOUNDMENT BORING LOCATIONS

DWG DATE: 10 MAY 2016	FILE NAME: Boring Locations.dwg	
DRAWN: J. BARKER	CHECKED: J. BARKER	ENGR: DCU
SCALE: 1" = 300'	SHEET: 1 OF 1	REV: 0

LOG OF BORING NO. LB-1

PROJECT: **Lang Impoundment**
PROJECT NO.: **160238**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	14.0	5.0	BOC
DATE:	3/15/16	3/15/16	
CAVED (ft):	In Auger	6.5	

DATE STARTED: **3/15/16**
DATE COMPLETED: **3/15/16**
DRILLING CONTRACTOR: **GTA**
DRILLER: **Dan Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **14.0**
GROUND SURFACE ELEVATION: **6.6**
DATUM: **NAVD 88**
EQUIPMENT: **ATVCME550X**
LOGGED BY: **T. Kane**
CHECKED BY: **E. Williams**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					6.6	0			Brown and gray, moist, very stiff, sandy lean clay FILL	
S-1	0.0	14	3-8-8-7	16						
S-2	2.0	15	5-8-8-8	16					Brown, moist, very stiff, sandy lean clay FILL	
S-3	4.0	0	WOH/24			5			No Recovery	
					0.6		SM		Brown and gray, moist, loose, Silty SAND	
S-4	6.0	10	2-4-5-6	9						
S-5	8.0	8	2-3-3-4	6					Same, moist to wet	
						10				
S-6	13.0	12	1-3-4-5	7					Same, wet	
						15				
					-11.4		SP-SM		Brown, wet, very loose, Poorly-graded SAND with silt	
S-7	18.0	4	1-2-2-2	4						
						20				
S-8	23.0	6	8-16-16-17	32					Brown, wet, dense, Poorly-graded SAND with silt and gravel	
					-18.4	25			Boring terminated at 25.0 feet.	

NOTES: **Easting: 612048.68 Northing: 555314.27**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. LB-1

LOG OF BORING NO. LB-2

PROJECT: **Lang Impoundment**
PROJECT NO.: **160238**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	10.5	8.3	BOC
DATE:	3/15/16	3/15/16	
CAVED (ft):	In Auger	9.1	

DATE STARTED: **3/15/16**
DATE COMPLETED: **3/15/16**
DRILLING CONTRACTOR: **GTA**
DRILLER: **Dan Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **10.5**
GROUND SURFACE ELEVATION: **6.9**
DATUM: **NAVD 88**
EQUIPMENT: **ATVCME550X**
LOGGED BY: **T. Kane**
CHECKED BY: **E. Williams**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					6.9	0			Brown and gray, moist, stiff, sandy lean clay FILL	
S-1	0.0	18	4-7-5-7	12						
									Gray, moist, stiff, elastic silt FILL	
S-2	2.0	13	4-4-5-5	9						
					2.9		ML		Gray, moist, very soft, Sandy SILT	
S-3	4.0	1	WOH/24			5				
									Same, contains organic materials	
S-4	6.0	14	WOH/24							
									Same	
S-5	8.0	13	WOH/24							
						10				
									Gray, wet, Sandy SILT contains organic materials	
S-6	13.0	24	PUSH							
						15				
									Same, very soft	
S-7	18.0	24	WOH/24							
						20				
									Same	
S-8	23.0	24	WOH/24							
					-18.1	25			Boring terminated at 25.0 feet.	

NOTES: **Easting: 612298.79 Northing: 555614.88**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. LB-2

LOG OF BORING NO. LB-3

PROJECT: **Lang Impoundment**
PROJECT NO.: **160238**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	Dry	11.0	BOC
DATE:	3/15/16	3/15/16	
CAVED (ft):	In Auger	16.0	

DATE STARTED: **3/14/16**
DATE COMPLETED: **3/14/16**
DRILLING CONTRACTOR: **GTA**
DRILLER: **Dan Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **Dry**
GROUND SURFACE ELEVATION: **6.2**
DATUM: **NAVD 88**
EQUIPMENT: **ATVCME550X**
LOGGED BY: **T. Kane**
CHECKED BY: **E. Williams**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					6.2	0			Brown and gray, moist, stiff, sandy lean clay FILL	
S-1	0.0	18	4-5-7-8	12						
S-2	2.0	17	5-5-6-6	11					Orange-yellow-brown, moist, stiff, sandy elastic silt FILL	
					2.2		ML		Gray, moist, soft, Sandy SILT, contains organic materials	
S-3	4.0	1	1-1-1-1	2		5				
S-4	6.0	24	1-1-1-1	2					Same	
S-5	8.0	24	PUSH						Same, wet	Push Shelby Tube 8-10 feet.
						10				
S-6	13.0	24	WOH/24						Same, very soft	
						15				
S-7	18.0	24	WOH/24						Same	
						20				
S-8	23.0	24	WOH/24						Same	
					-18.8	25			Boring terminated at 25.0 feet.	

NOTES: **Easting: 612615.51 Northing: 555978.42**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. LB-3

LOG OF BORING NO. LB-4

PROJECT: **Lang Impoundment**
PROJECT NO.: **160238**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	14.5	11.2	BOC
DATE:	3/15/16	3/15/16	
CAVED (ft):	In Auger	14.8	

DATE STARTED: **3/14/16**
DATE COMPLETED: **3/14/16**
DRILLING CONTRACTOR: **GTA**
DRILLER: **Dan Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **14.5**
GROUND SURFACE ELEVATION: **8.5**
DATUM: **NAVD 88**
EQUIPMENT: **ATVCME550X**
LOGGED BY: **T. Kane**
CHECKED BY: **E. Williams**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					8.5	0			Brown and gray, moist, medium stiff, sandy lean clay FILL	
S-1	0.0	14	4-2-3-14	5						
									Gray, moist, stiff, lean clay FILL	
S-2	2.0	6	3-5-5-4	10						
					4.5		ML		Black, moist, medium stiff, Sandy SILT, contains organic materials	
S-3	4.0	17	2-2-4-4	6		5				
									Gray, moist, medium stiff, Sandy SILT	
S-4	6.0	13	4-4-4-4	8						
									Same, soft	
S-5	8.0	7	1-1-1-1	2						
						10				
									Same, wet, very soft	
S-6	13.0	24	WOH/24							
						15				
									Same, soft	
S-7	18.0	24	1-1-1-1	2						
						20				
									Same	
S-8	23.0	24	1-1-1-1	2						
					-16.5	25			Boring terminated at 25.0 feet.	

NOTES: **Easting: 612638.81 Northing: 556382.69**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. LB-4

LOG OF BORING NO. LB-5

PROJECT: **Lang Impoundment**
PROJECT NO.: **160238**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	13.0	8.1	BOC
DATE:	3/14/16	3/14/16	
CAVED (ft):	In Auger	13.1	

DATE STARTED: **3/14/16**
DATE COMPLETED: **3/14/16**
DRILLING CONTRACTOR: **GTA**
DRILLER: **Dan Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **13.0**
GROUND SURFACE ELEVATION: **8.5**
DATUM: **NAVD 88**
EQUIPMENT: **ATVCME550X**
LOGGED BY: **T. Kane**
CHECKED BY: **E. Williams**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					8.5	0			Brown and gray, moist, soft, sandy lean clay FILL	
S-1	0.0	6	2-2-2-1	4						
									Same	
S-2	2.0	5	1-1-2-2	3						
									Tan, moist, very loose, clayey sand FILL	
S-3	4.0	13	1-2-2-2	4		5				
					2.5		ML		Gray, moist, soft, Sandy SILT	
S-4	6.0	12	2-2-2-2	4						
									Same	
S-5	8.0	16	1-1-1-1	2						
						10				
					-4.5		SC		Gray, wet, very loose, Clayey SAND	
S-6	13.0	18	1-2-1-2	3						
						15				
					-9.5		SM		Brown, wet, loose, Silty SAND	
S-7	18.0	12	2-2-3-3	5						
						20				
					-14.5		SP-SM		Brown, wet, very loose, Poorly-graded SAND with silt	
S-8	23.0	18	2-2-2-2	4						
					-16.5	25			Boring terminated at 25.0 feet.	

NOTES: **Easting: 612555.17 Northing: 556775.44**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. LB-5

LOG OF BORING NO. LB-6

PROJECT: **Lang Impoundment**
PROJECT NO.: **160238**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	15.0	9.6	BOC
DATE:	3/10/16	3/10/16	
CAVED (ft):	In Auger	15.1	

DATE STARTED: **3/10/16**
DATE COMPLETED: **3/10/16**
DRILLING CONTRACTOR: **GTA**
DRILLER: **Dan Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **15.0**
GROUND SURFACE ELEVATION: **9.5**
DATUM: **NAVD 88**
EQUIPMENT: **ATVCME550X**
LOGGED BY: **T. Kane**
CHECKED BY: **E. Williams**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					9.5	0			Brown and gray, moist, very loose, clayey sand FILL	
S-1	0.0	15	1-1-2-4	3						
									Same	
S-2	2.0	14	4-2-2-2	4						
									Same	
S-3	4.0	10	1-2-1-2	3		5				
					3.5		SM		Brown, moist, medium dense, Silty SAND	
S-4	6.0	18	3-6-7-7	13						
					1.5		ML		Black, moist, soft, Sandy SILT contains organic materials	
S-5	8.0	17	1-2-1-1	3						
						10				
					-3.5		SM		Brown, wet, very loose, Silty SAND	
S-6	13.0	14	2-2-2-2	4						
						15				
					-8.5		SP-SM		Gray, wet, very loose, Poorly-graded SAND with silt	
S-7	18.0	13	1-2-2-1	4						
						20				
									Same, loose	
S-8	23.0	18	2-3-3-4	6						
					-15.5	25			Boring terminated at 25.0 feet.	

NOTES: **Easting: 612326.24 Northing: 557049.63**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. LB-6

LOG OF BORING NO. LB-7

PROJECT: **Lang Impoundment**
PROJECT NO.: **160238**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	10.0	9.0	BOC
DATE:	3/10/16	3/10/16	
CAVED (ft):	In Auger	13.1	

DATE STARTED: **3/10/16**
DATE COMPLETED: **3/10/16**
DRILLING CONTRACTOR: **GTA**
DRILLER: **Dan Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **10.0**
GROUND SURFACE ELEVATION: **9.0**
DATUM: **NAVD 88**
EQUIPMENT: **ATVCME550X**
LOGGED BY: **T. Kane**
CHECKED BY: **E. Williams**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					9.0	0			Brown and gray, moist, very loose, clayey sand FILL	
S-1	0.0	3	1-1-2-2	3						
									Same, loose	
S-2	2.0	5	3-3-2-3	5						
									Same	
S-3	4.0	20	2-3-4-4	7		5				
					3.0		ML		Gray, moist, medium stiff, Sandy SILT	
S-4	6.0	17	3-3-3-4	6						
					1.0		SM		Gray, wet, very loose, Silty SAND	
S-5	8.0	15	1-1-1-1	2						
						10				
									Same	
S-6	13.0	16	1-1-1-1	2						
						15				
					-9.0		SP-SM		Gray, wet, very loose, Poorly-graded SAND with silt	
S-7	18.0	14	2-2-2-3	4						
						20				
									Same, loose	
S-8	23.0	21	2-3-3-4	6						
					-16.0	25			Boring terminated at 25.0 feet.	

NOTES: **Easting: 612099.90 Northing: 557289.96**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. LB-7

LOG OF BORING NO. LB-8

PROJECT: **Lang Impoundment**
PROJECT NO.: **160238**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	10.0	8.6	BOC
DATE:	3/10/16	3/10/16	
CAVED (ft):	In Auger	13.0	

DATE STARTED: **3/10/16**
DATE COMPLETED: **3/10/16**
DRILLING CONTRACTOR: **GTA**
DRILLER: **Dan Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **10.0**
GROUND SURFACE ELEVATION: **9.5**
DATUM: **NAVD 88**
EQUIPMENT: **ATVCME550X**
LOGGED BY: **T. Kane**
CHECKED BY: **E. Williams**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					9.5	0			Brown and gray, moist, very loose, clayey sand FILL	
S-1	0.0	14	1-1-2-3	3						
									Same, loose	
S-2	2.0	16	2-5-5-4	10						
									Same	
S-3	4.0	18	2-3-4-5	7		5				
									Brown, moist to wet, loose, silty sand FILL	
S-4	6.0	20	4-4-4-4	8						
					1.5		ML		Gray, wet, soft, Sandy SILT contains organic materials	
S-5	8.0	20	1-1-1-1	2						
						10				
					-3.5		SM		Gray, wet, very loose, Silty SAND	
S-6	13.0	16	1-1-2-4	3						
						15				
					-8.5		SP-SM		Tan, wet, loose, Poorly-graded SAND with silt	
S-7	18.0	18	2-2-4-5	6						
						20				
									Same, medium dense	
S-8	23.0	11	4-5-6-6	11						
					-15.5	25			Boring terminated at 25.0 feet.	

NOTES: **Easting: 611698.64 Northing: 557278.08**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. LB-8

LOG OF BORING NO. LB-9

PROJECT: **Lang Impoundment**
PROJECT NO.: **160238**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	17.0	9.0	BOC
DATE:	3/10/16	3/10/16	
CAVED (ft):	In Auger	12.0	

DATE STARTED: **3/10/16**
DATE COMPLETED: **3/10/16**
DRILLING CONTRACTOR: **GTA**
DRILLER: **Dan Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **17.0**
GROUND SURFACE ELEVATION: **10.4**
DATUM: **NAVD 88**
EQUIPMENT: **ATVCME550X**
LOGGED BY: **T. Kane**
CHECKED BY: **E. Williams**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					10.4	0			Brown and gray, moist, very loose, clayey sand FILL	
S-1	0.0	10	2-2-2-2	4						
									Tan, moist, very loose, silty sand, FILL	
S-2	2.0	20	2-2-2-3	4						
									Same	
S-3	4.0	17	2-2-2-3	4		5				
									Same	
S-4	6.0	16	2-2-2-3	4						
					2.4		SC		Orange, moist to wet, very loose, Clayey SAND	
S-5	8.0	19	1-1-3-3	4						
						10				
					-2.6		SM		Tan, wet, loose, Silty SAND	
S-6	13.0	14	1-3-7-9	10						
						15				
									Same	
S-7	18.0	12	2-2-3-5	5						
						20				
					-12.6		SP-SM		Brown, wet, very loose, Poorly-graded SAND with silt	
S-8	23.0	8	1-1-2-4	3						
					-14.6	25			Boring terminated at 25.0 feet.	

NOTES: **Easting: 611299.01 Northing: 557276.67**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. LB-9

LOG OF BORING NO. LB-10

PROJECT: **Lang Impoundment**
PROJECT NO.: **160238**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	15.5	8.0	BOC
DATE:	3/10/16	3/10/16	
CAVED (ft):	In Auger	10.0	

DATE STARTED: **3/10/16**
DATE COMPLETED: **3/10/16**
DRILLING CONTRACTOR: **GTA**
DRILLER: **Dan Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **13.0**
GROUND SURFACE ELEVATION: **8.4**
DATUM: **NAVD 88**
EQUIPMENT: **ATVCME550X**
LOGGED BY: **T. Kane**
CHECKED BY: **E. Williams**

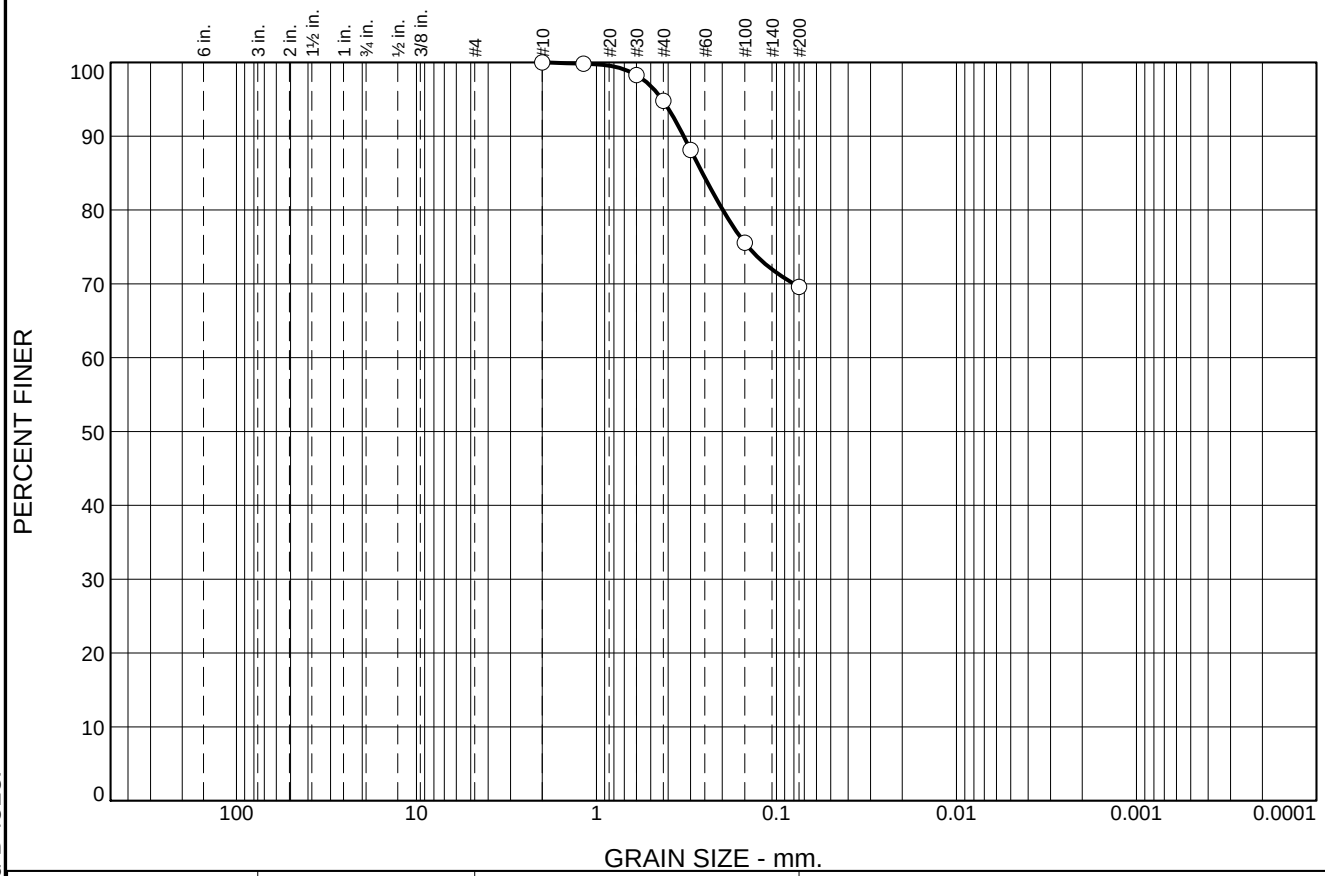
SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					8.4	0			Brown and gray, moist, soft, sandy lean clay FILL	
S-1	0.0	8	1-1-2-2	3						
									Same	
S-2	2.0	6	2-2-2-2	4						
									Gray, moist, loose, clayey sand FILL	
S-3	4.0	12	1-2-4-3	6		5				
					2.4		ML		Black and gray, wet, medium stiff, Sandy SILT contains organic materials	
S-4	6.0	6	3-2-3-3	5						
									Same, soft	
S-5	8.0	16	1-1-1-1	2						
						10				
					-4.6		SP-SM		Brown, wet, very loose, Poorly-graded SAND with silt	
S-6	13.0	12	WOH/12	1						
						15				
									Same	
S-7	18.0	6	WOH/12	1						
						20				
					-14.6		SM		Brown, wet, medium dense, Silty SAND	
S-8	23.0	5	4-5-6-5	11						
					-16.6	25			Boring terminated at 25.0 feet.	

NOTES: **Easting: 610898.90 Northing: 557266.82**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. LB-10

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	5.2	25.2	69.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#16	99.8		
#30	98.3		
#40	94.8		
#50	88.1		
#100	75.6		
#200	69.6		

* (no specification provided)

Soil Description

Brown, moist, sandy lean clay FILL

Atterberg Limits

PL= LL= PI= NM= 12.8

Coefficients

D_{90}= 0.3280 D_{85}= 0.2576 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: LB-1 **Depth:** 2.0
Sample Number: S-2 **Date:** 3/31/2016

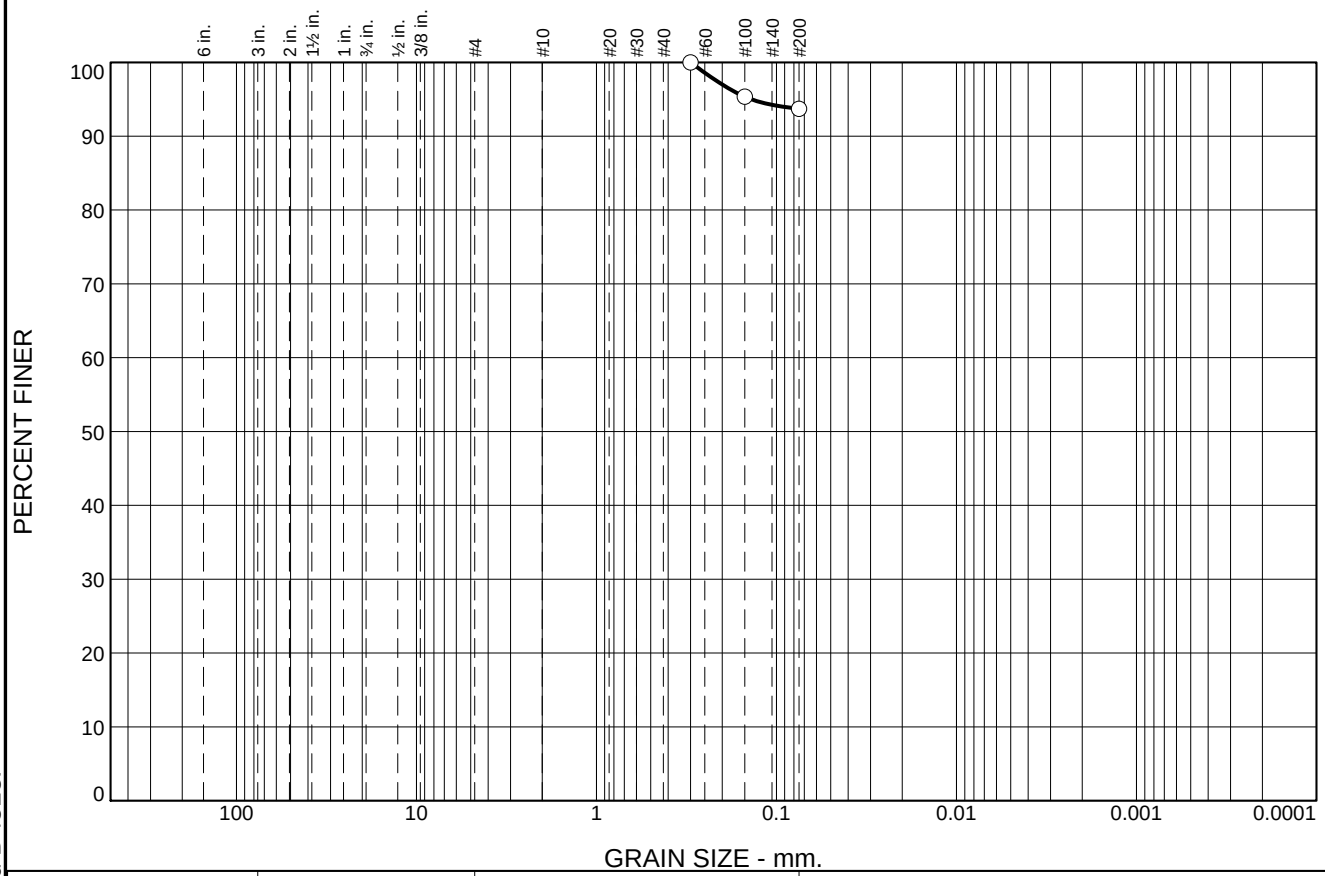
GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

Client: Gahagan & Bryant Associates, Inc.
Project: Lang Impoundment
Project No: 160238 **Figure**

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: K. Kershaw **Checked By:** E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	6.3	93.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#50	100.0		
#100	95.3		
#200	93.7		

* (no specification provided)

Soil Description

Gray, moist, elastic silt FILL

Atterberg Limits

PL= LL= PI= NM= 61.5

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: LB-2 **Depth:** 2.0
Sample Number: S-2 **Date:** 3/31/2016

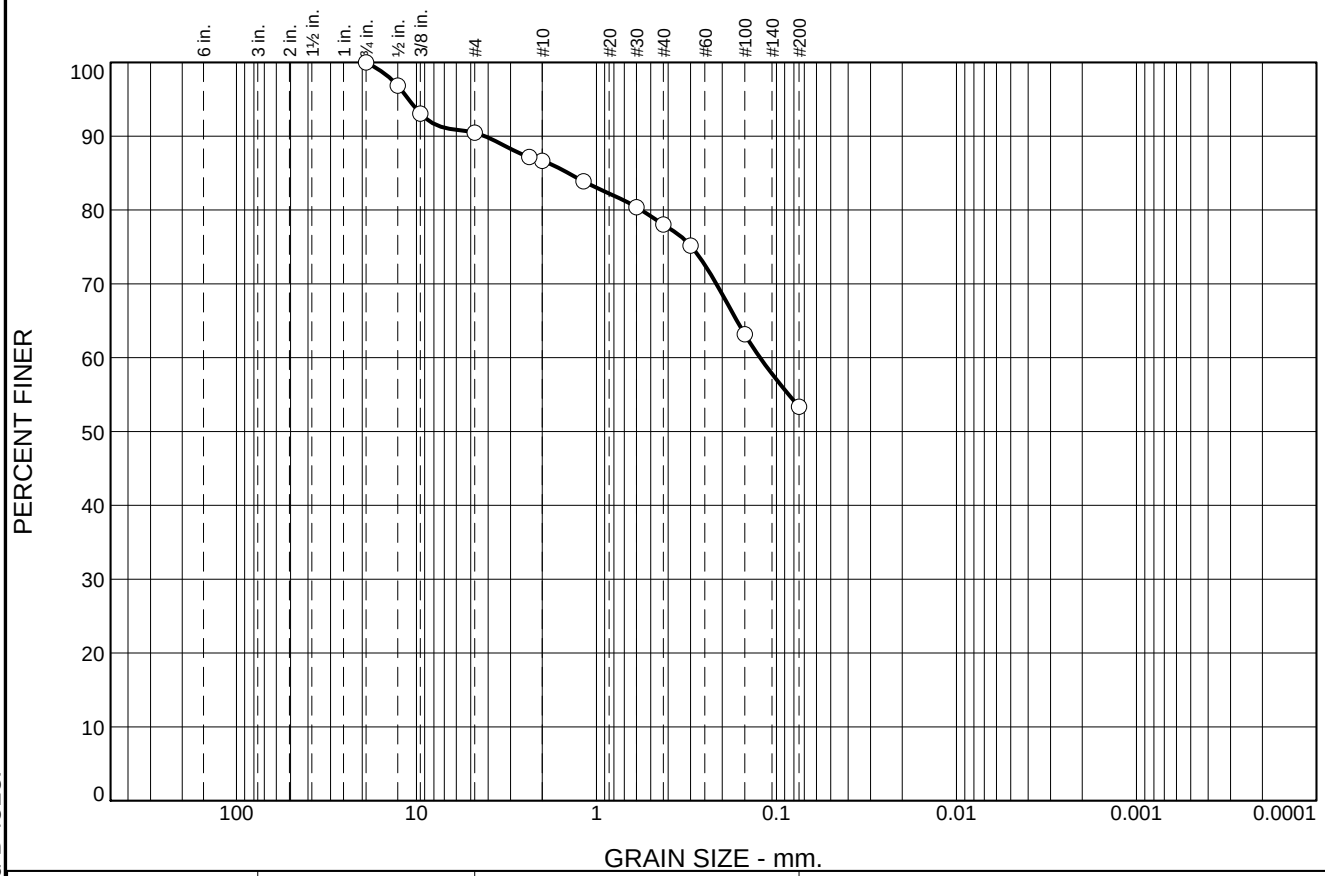
GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

Client: Gahagan & Bryant Associates, Inc.
Project: Lang Impoundment
Project No: 160238 **Figure**

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: K. Kershaw **Checked By:** E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	9.5	3.8	8.7	24.6	53.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	96.8		
.375	93.1		
#4	90.5		
#8	87.2		
#10	86.7		
#16	83.9		
#30	80.4		
#40	78.0		
#50	75.2		
#100	63.2		
#200	53.4		

* (no specification provided)

Soil Description

Orange-yellow-brown, moist, sandy elastic silt FILL

Atterberg Limits

PL= LL= PI= NM= 44.4

Coefficients

D_{90}= 4.1678 D_{85}= 1.4322 D_{60}= 0.1234
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: LB-3 **Depth:** 2.0
Sample Number: S-2 **Date:** 3/31/2016

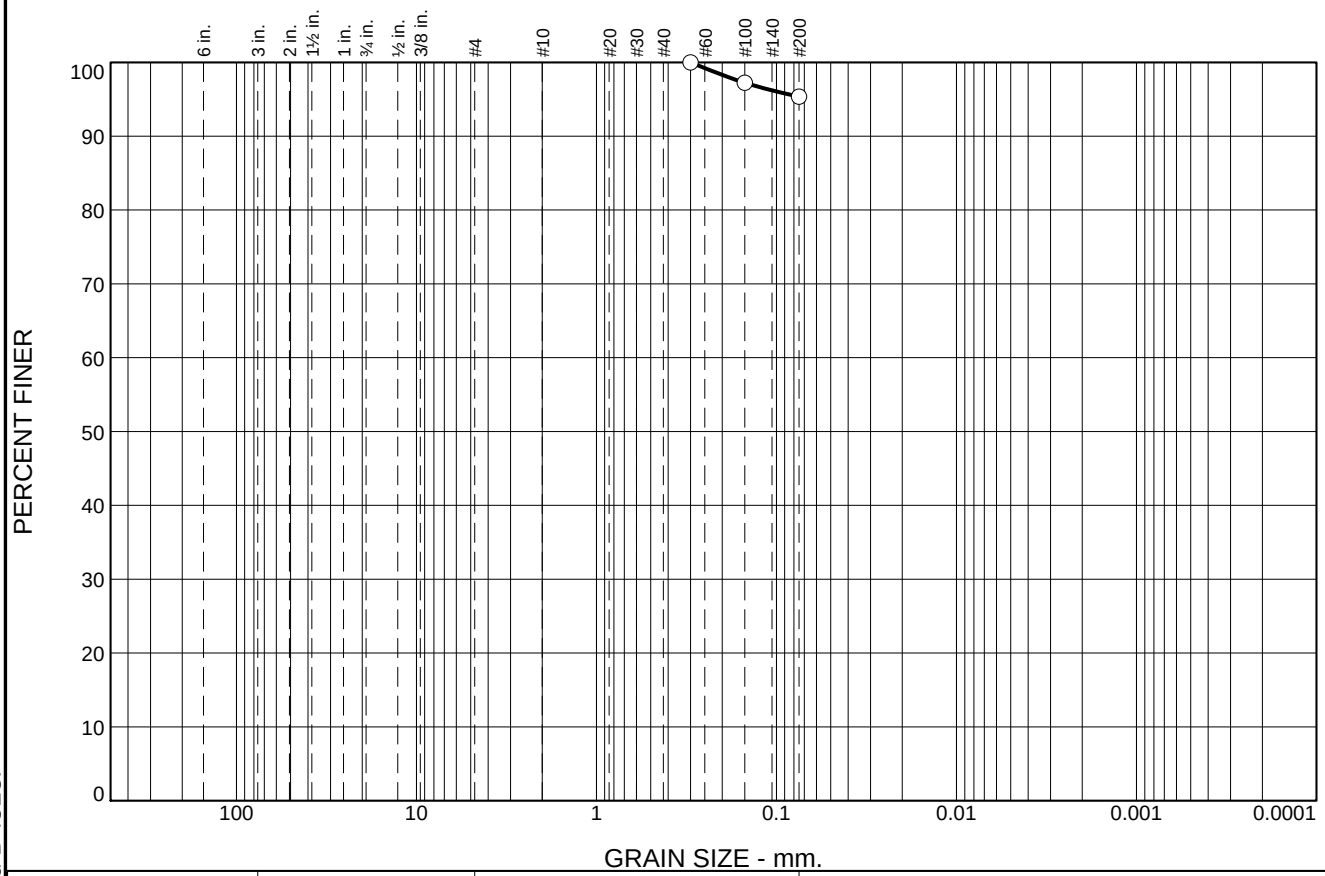
GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

Client: Gahagan & Bryant Associates, Inc.
Project: Lang Impoundment
Project No: 160238 **Figure**

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: K. Kershaw **Checked By:** E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	4.6	95.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#50	100.0		
#100	97.2		
#200	95.4		

* (no specification provided)

Soil Description

Gray, moist, lean clay FILL

Atterberg Limits

PL= LL= PI= NM= 34.2

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: LB-4 **Depth:** 2.0
Sample Number: S-2 **Date:** 3/31/2016

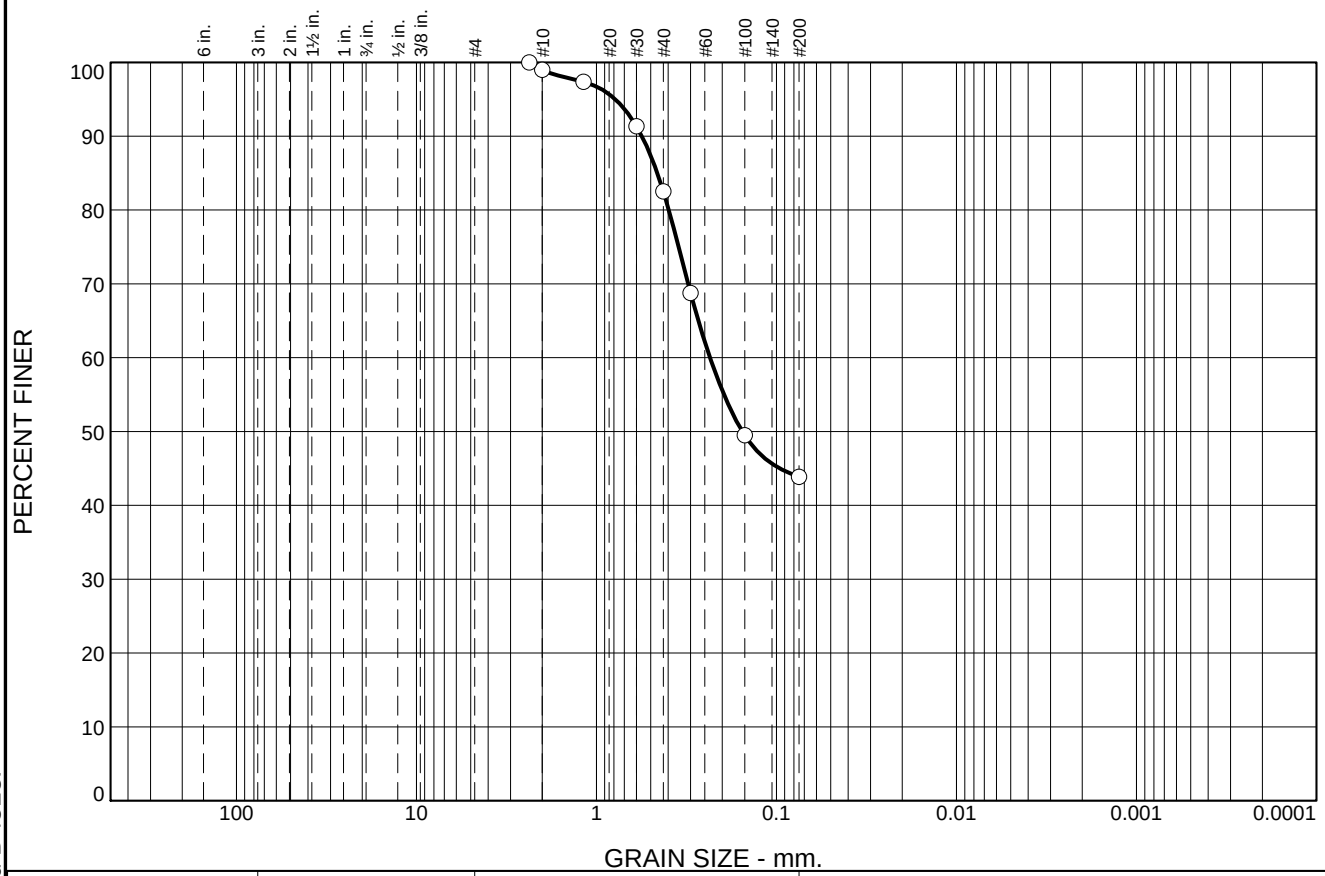
GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

Client: Gahagan & Bryant Associates, Inc.
Project: Lang Impoundment
Project No: 160238 **Figure**

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: K. Kershaw **Checked By:** E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.0	16.5	38.6	43.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#10	99.0		
#16	97.4		
#30	91.3		
#40	82.5		
#50	68.8		
#100	49.5		
#200	43.9		

* (no specification provided)

Soil Description

Tan, moist, clayey sand FILL

Atterberg Limits

PL= LL= PI= NM= 12.6

Coefficients

D_{90}= 0.5595 D_{85}= 0.4588 D_{60}= 0.2339
D_{50}= 0.1546 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: LB-5 **Depth:** 4.0
Sample Number: S-3 **Date:** 3/31/2016

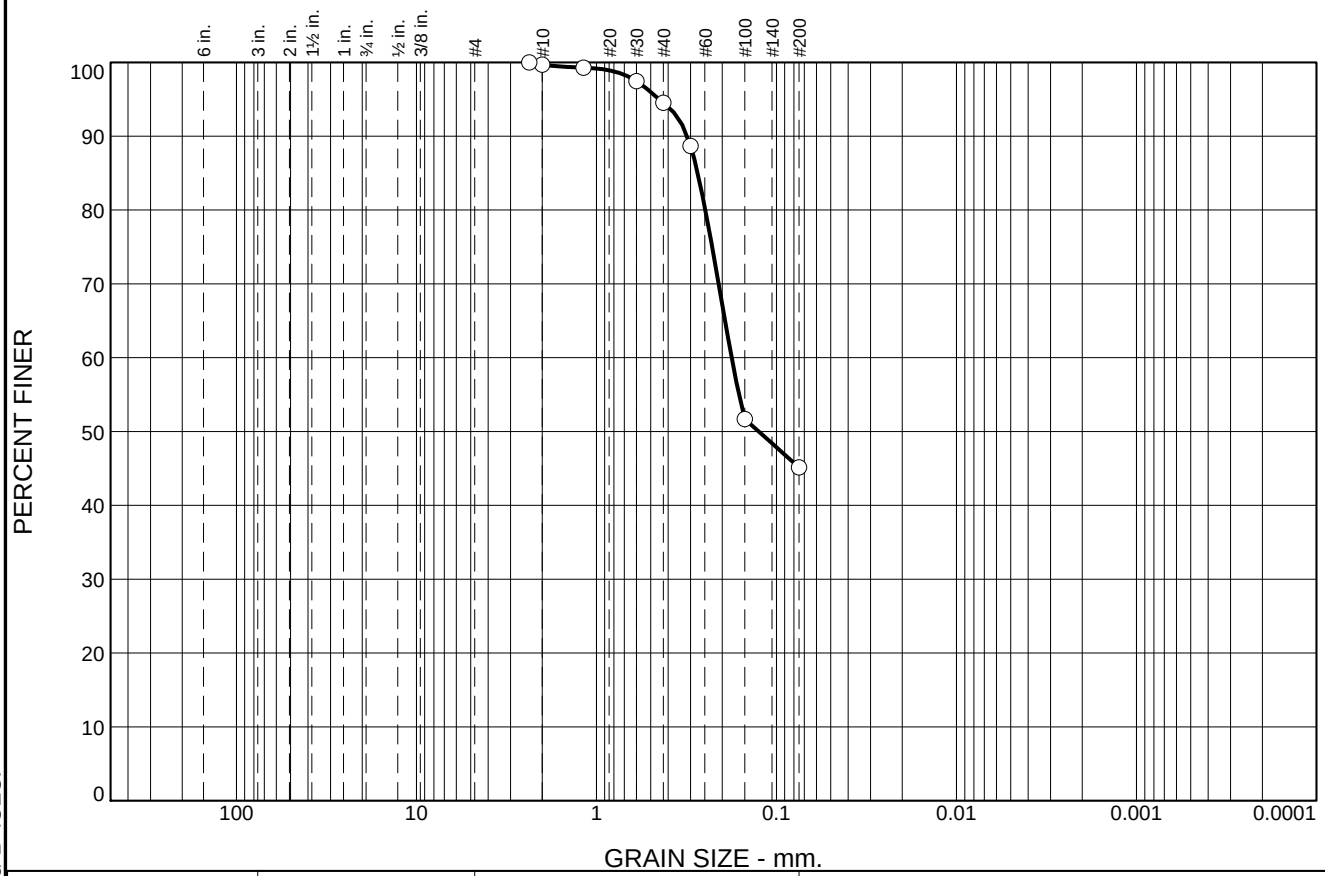
GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

Client: Gahagan & Bryant Associates, Inc.
Project: Lang Impoundment
Project No: 160238 **Figure**

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: K. Kershaw **Checked By:** E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	5.2	49.4	45.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#10	99.7		
#16	99.3		
#30	97.5		
#40	94.5		
#50	88.7		
#100	51.7		
#200	45.1		

* (no specification provided)

Soil Description

Brown and gray, moist, clayey sand FILL

Atterberg Limits

PL= LL= PI= NM= 18.2

Coefficients

D_{90}= 0.3132 D_{85}= 0.2738 D_{60}= 0.1775
D_{50}= 0.1254 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: LB-6 **Depth:** 4.0
Sample Number: S-3 **Date:** 3/31/2016

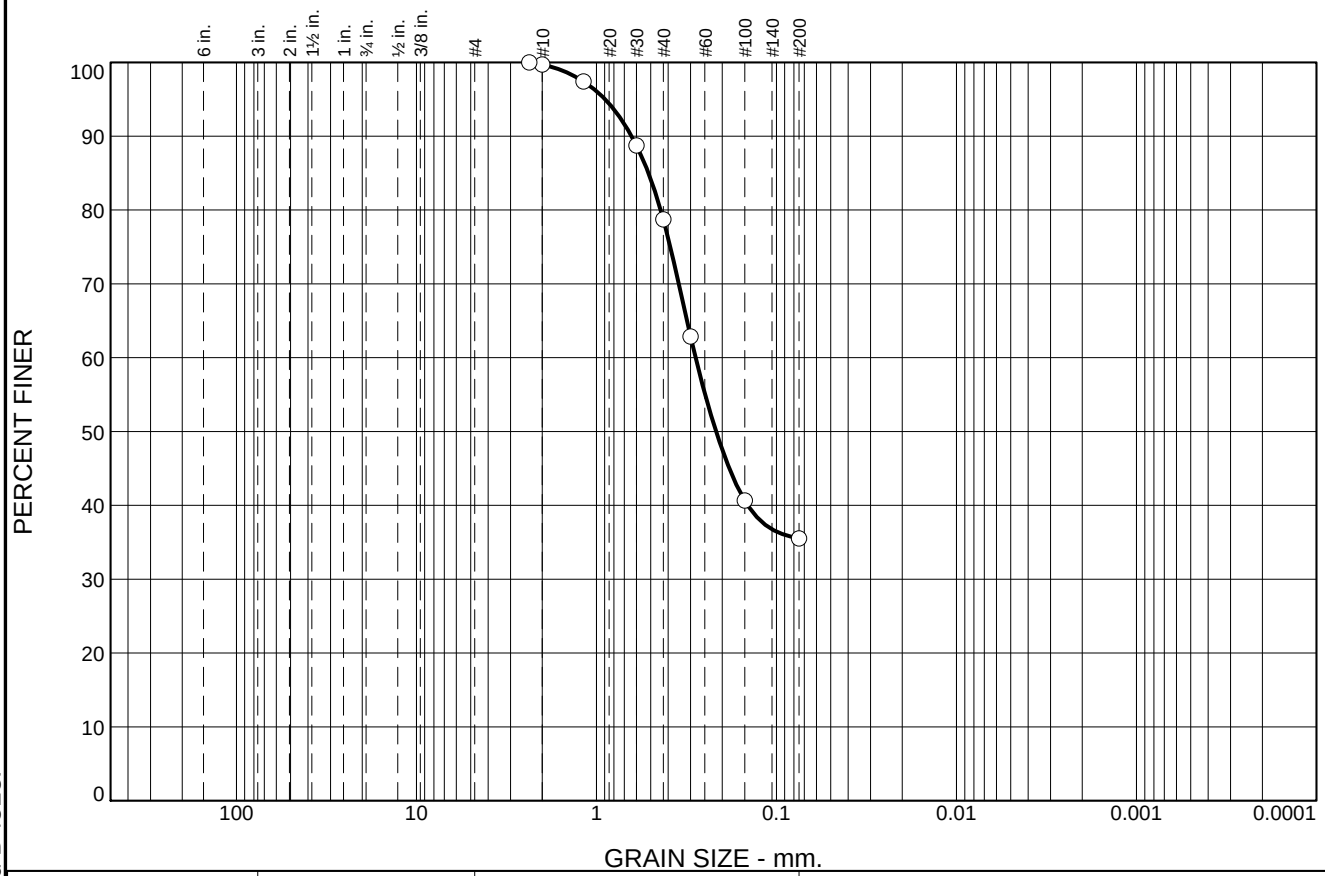
GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

Client: Gahagan & Bryant Associates, Inc.
Project: Lang Impoundment
Project No: 160238 **Figure**

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: K. Kershaw **Checked By:** E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	21.0	43.2	35.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#10	99.7		
#16	97.4		
#30	88.7		
#40	78.7		
#50	62.9		
#100	40.7		
#200	35.5		

* (no specification provided)

Soil Description

Brown and gray, moist, clayey sand FILL

Atterberg Limits

PL= LL= PI= NM= 12.2

Coefficients

D_{90}= 0.6385 D_{85}= 0.5138 D_{60}= 0.2812
D_{50}= 0.2165 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: LB-7 **Depth:** 4.0
Sample Number: S-3 **Date:** 3/31/2016

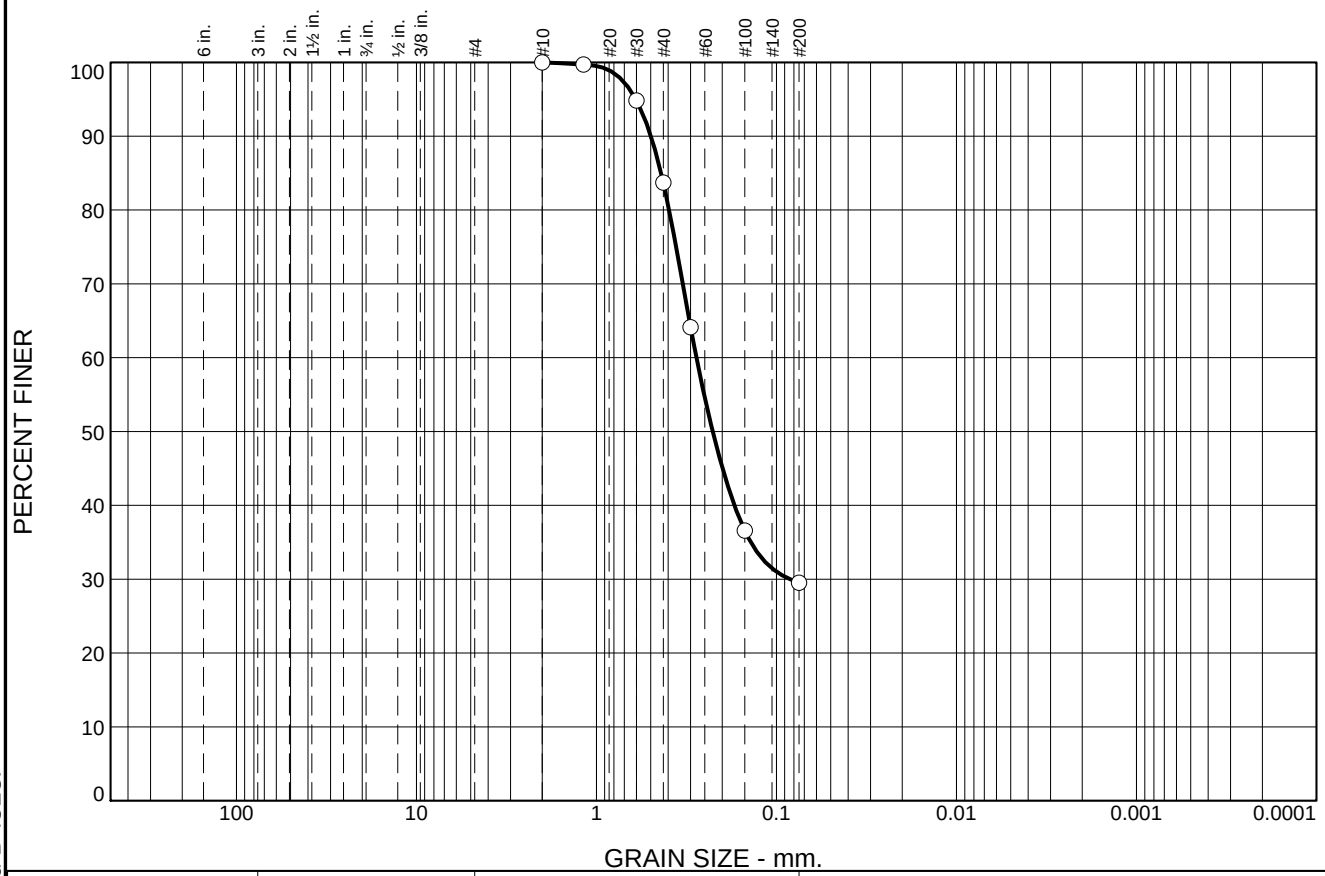
GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

Client: Gahagan & Bryant Associates, Inc.
Project: Lang Impoundment
Project No: 160238 **Figure**

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: K. Kershaw **Checked By:** E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	16.3	54.2	29.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#16	99.7		
#30	94.8		
#40	83.7		
#50	64.1		
#100	36.6		
#200	29.5		

* (no specification provided)

Soil Description

Brown, moist to wet, silty sand FILL

Atterberg Limits

PL= LL= PI= NM= 15.2

Coefficients

D_{90}= 0.4980 D_{85}= 0.4371 D_{60}= 0.2783
D_{50}= 0.2260 D_{30}= 0.0840 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: LB-8 **Depth:** 6.0
Sample Number: S-4 **Date:** 3/31/2016

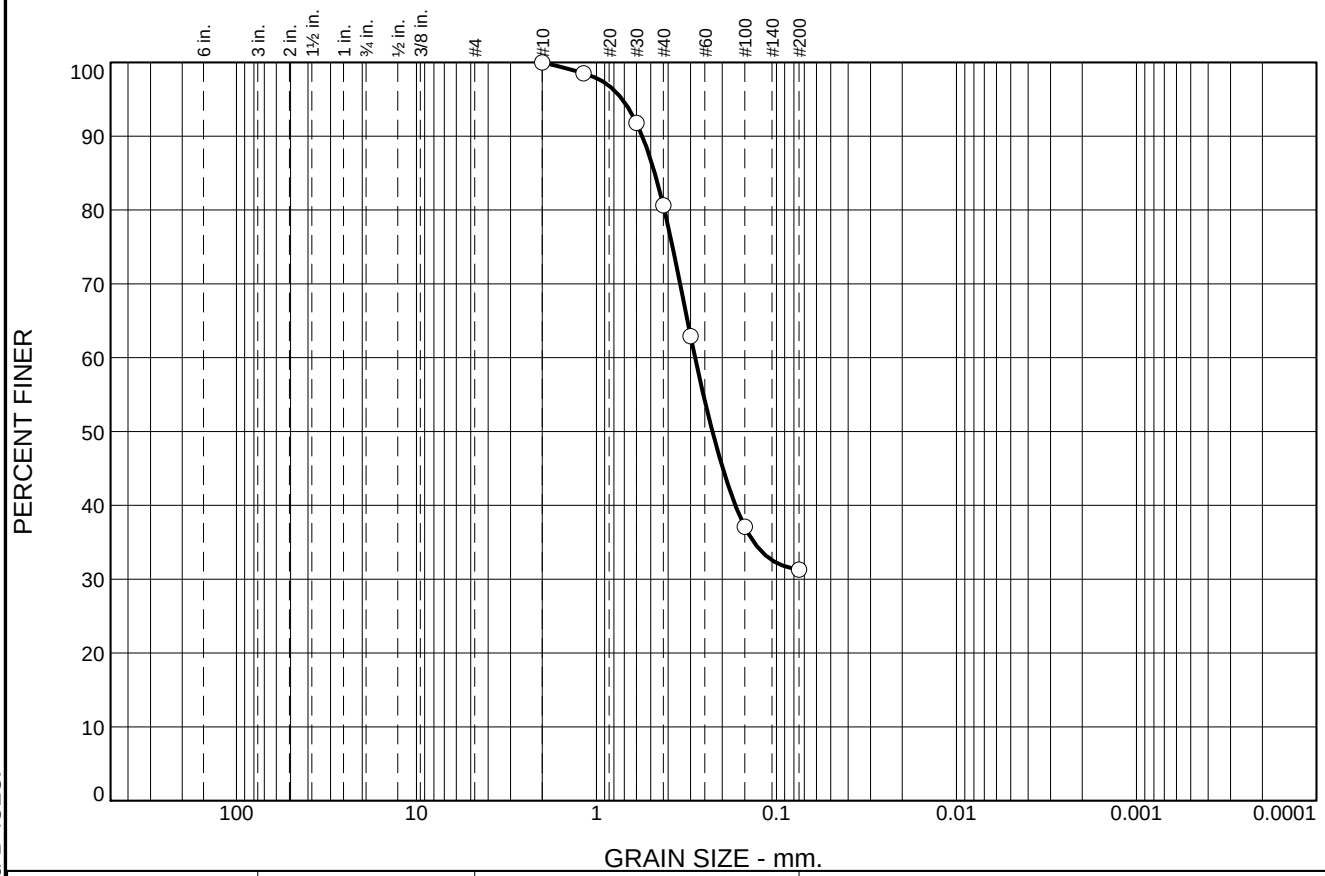
GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

Client: Gahagan & Bryant Associates, Inc.
Project: Lang Impoundment
Project No: 160238 **Figure**

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: K. Kershaw **Checked By:** E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	19.4	49.3	31.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#16	98.5		
#30	91.8		
#40	80.6		
#50	62.9		
#100	37.1		
#200	31.3		

* (no specification provided)

Soil Description

Tan, moist, silty sand FILL

Atterberg Limits

PL= LL= PI= NM= 13.6

Coefficients

D_{90}= 0.5566 D_{85}= 0.4740 D_{60}= 0.2831
D_{50}= 0.2268 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: LB-9 **Depth:** 4.0
Sample Number: S-3 **Date:** 3/31/2016

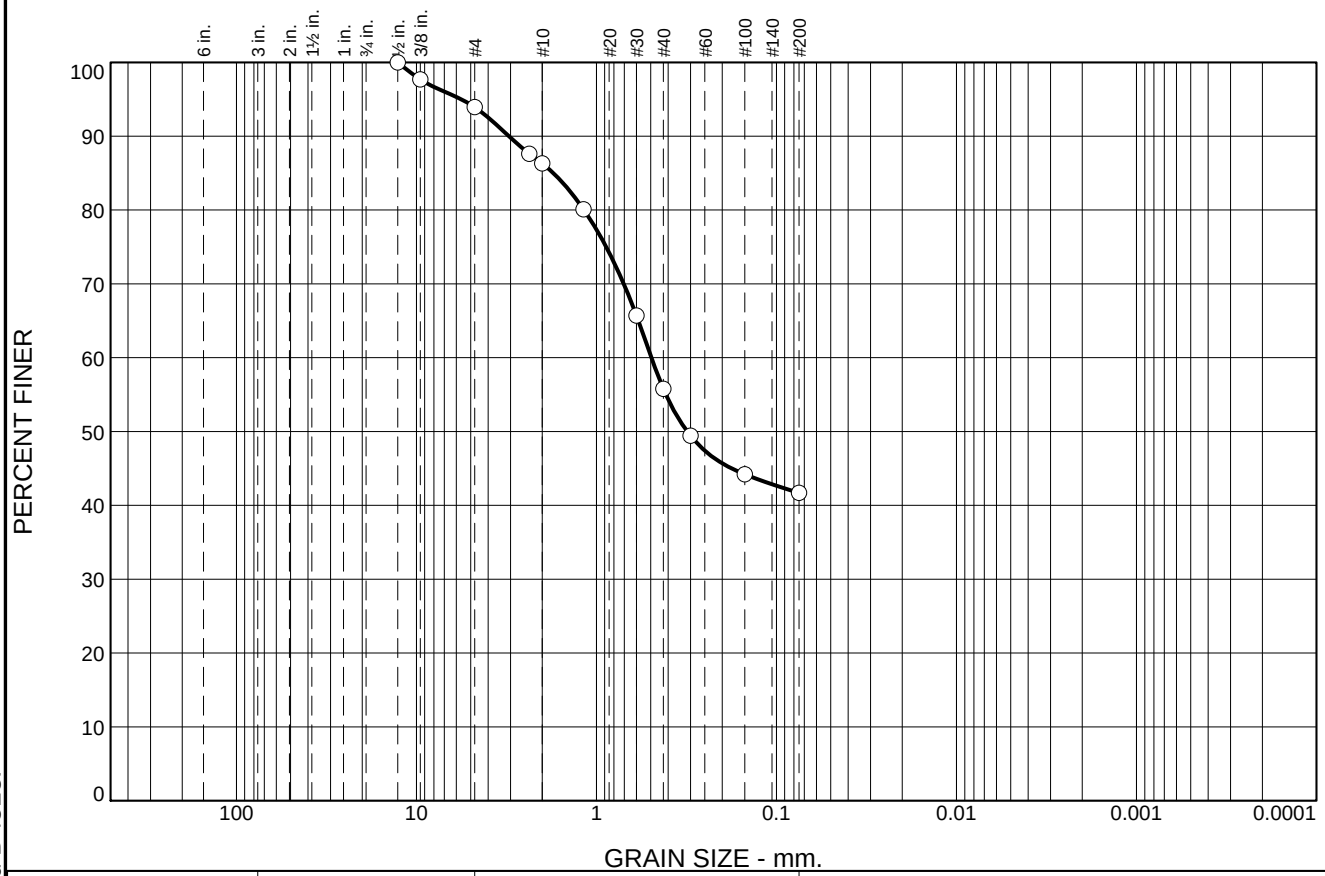
GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

Client: Gahagan & Bryant Associates, Inc.
Project: Lang Impoundment
Project No: 160238 **Figure**

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: K. Kershaw **Checked By:** E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.1	7.6	30.5	14.1	41.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	97.7		
#4	93.9		
#8	87.6		
#10	86.3		
#16	80.1		
#30	65.7		
#40	55.8		
#50	49.4		
#100	44.2		
#200	41.7		

* (no specification provided)

Soil Description

Gray, moist, clayey sand FILL

Atterberg Limits

PL= LL= PI= NM= 14.5

Coefficients

D_{90}= 3.0646 D_{85}= 1.7342 D_{60}= 0.4951
D_{50}= 0.3130 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: LB-10 **Depth:** 4.0
Sample Number: S-3 **Date:** 3/31/2016

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

Client: Gahagan & Bryant Associates, Inc.
Project: Lang Impoundment
Project No: 160238 **Figure**

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: K. Kershaw **Checked By:** E. Williams