

Borrow Area Geotechnical Services

West Fourchon Marsh Creation and Nourishment
Project (TE-134)
Lafourche Parish, Louisiana

for

Coastal Engineering Consultants, Inc.

March 13, 2019



GEOENGINEERS 
Earth Science + Technology

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11955 Lakeland Park Boulevard, Suite 100
Baton Rouge, Louisiana 70809
225.293.2460

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File No. 16715-045-00

March 13, 2019


Prepared for:


Coastal Engineering Consultants, Inc.
8570 Anselmo Lane
Baton Rouge, Louisiana 70810

Attention: Mr. Greg M. Grandy, ASLA

Prepared by:

GeoEngineers, Inc.
11955 Lakeland Park Boulevard, Suite 100
Baton Rouge, Louisiana 70809
225.293.2460


Joshua M. Pruett, PE
Geotechnical Engineer


David S. Eley, PE
Principal

JMP:DSE:klc



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INTRODUCTION

GeoEngineers, Inc. (GeoEngineers) is pleased to present this report of borrow area soil geotechnical logging and testing services to Coastal Engineering Consultants, Inc. (CEC) in support of the West Fourchon Marsh Creation and Nourishment (TE-134) project in Lafourche Parish, Louisiana. The project site is located in Lafourche Parish, Louisiana, between Port Fourchon and Bayou Lafourche and Timbalier Bay. The proposed borrow area investigation zone is approximately 3 miles southwest of Belle Pass.

Soil samples for this project were collected by Ocean Surveys, Inc. (OSI) using a vibracore, and delivered to GeoEngineers' office in Baton Rouge, Louisiana. This report presents the soil testing results.

Our testing services for this project were authorized by GEO Work Order No. 1 for CEC project number 16.205 dated December 9, 2016, referencing the October 14, 2014 Consulting Services Subcontract Agreement between CEC and GeoEngineers.

SAMPLE INFORMATION

The information GeoEngineers has regarding the sample cores from the chain-of-custody forms and vibracore sample log provided by OSI is summarized below.

Table 1 – Vibracore Information

Core ID	Date Collected	Water Depth (ft)	Core Length (ft)	Core Count
WF17-01	6/16/2017	31.2	20	4
WF17-02	6/16/2017	32.8	20	4
WF17-03	6/27/2017	33.5	20	4
WF17-04	6/27/2017	35.0	18.5	4
WF17-05	6/27/2017	36.3	16	3
WF17-06	6/27/2017	37.0	20	4
WF17-07	7/1/2017	32.5	20	4
WF17-08	7/1/2017	31.3	20	4
WF17-09	7/2/2017	33.5	19	4
WF17-10	7/2/2017	33.8	20	4
WF17-11	7/2/2017	36.4	20	4
WF17-12	6/27/2017	36.7	20	4
WF17-13	7/2/2017	37.4	20	4

SAMPLE PROCESSING & CLASSIFICATION

Vibracore samples were delivered to GeoEngineers in approximately 5-foot long core sections. Cores from WF17-01 and WF17-02 were delivered to GeoEngineers on June 19, 2017, and the remaining cores were delivered on July 3, 2017.

The cores were collected in plastic sleeves with an outside diameter of approximately 3.5-inches and approximately 1/16-inch thick walls. GeoEngineers cut the plastic sleeves, splitting the cores open length-wise. Figures A-1 through A-51 in Appendix A show photographs of the split cores.

Samples cores were cut into approximately 2-foot, or less, sections, classified and tested for moisture content. Classification and testing results for individual 2-foot (or less) sample sections are shown in the core logs in Appendix B. In addition, a composite sample consisting of a mix of the entire soil profile from each core was tested for moisture content, Atterberg limits, specific gravity and grain size. The composite sample was collected by cutting an approximate 3/4-inch square section from the entire core length and thoroughly mixing the sample. Appendix B contains vibracore logs with sample descriptions and laboratory testing data for composite samples. The table below summarizes testing results for the composite samples.

Table 2 - Composite Sample Testing Results

Core ID	Moisture Content (%)	Atterberg Limits		Specific Gravity	<#200 sieve (%)
		LL	PI		
WF17-01	59.0	73	50	2.74	99.5
WF17-02	56.2	67	46	2.72	99.7
WF17-03	58.7	70	47	2.73	99.1
WF17-04	61.9	81	59	2.75	99.1
WF17-05	62.3	78	55	2.72	99.5
WF17-06	60.4	87	66	2.82	99.7
WF17-07	60.3	83	59	2.78	99.3
WF17-08	60.3	81	61	2.75	99.5
WF17-09	62.7	86	62	2.75	99.1
WF17-10	59.4	83	60	2.76	99.5
WF17-11	61.2	78	58	2.80	99.0
WF17-12	61.6	89	64	2.76	99.5
WF17-13	64.6	88	67	2.72	99.5

SOIL DESCRIPTION

The borrow area soil consists primarily of a high plasticity clay with numerous silt lenses, pockets and layers. As indicated by the percent passing the #200 sieve (0.075 mm, and the demarcation between sand and silt), the composite soil samples contained one percent or less sand.

APPENDIX A

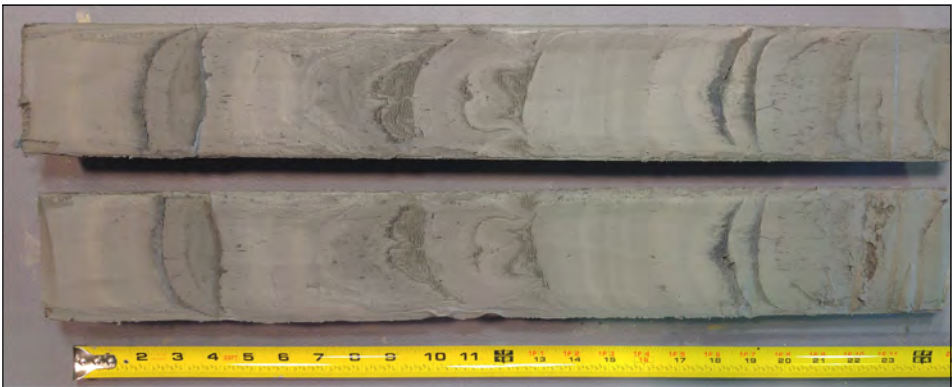
Vibracore Photo Logs

Top

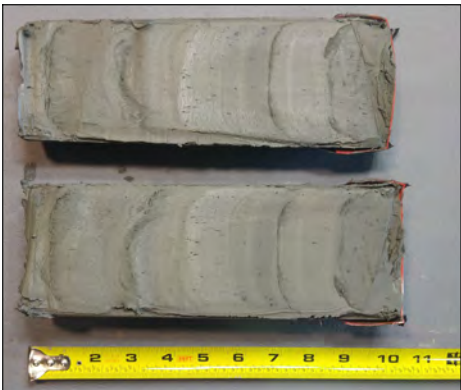
Bottom



WF17-01(d3)
Depth Below Mudline 0'-2'



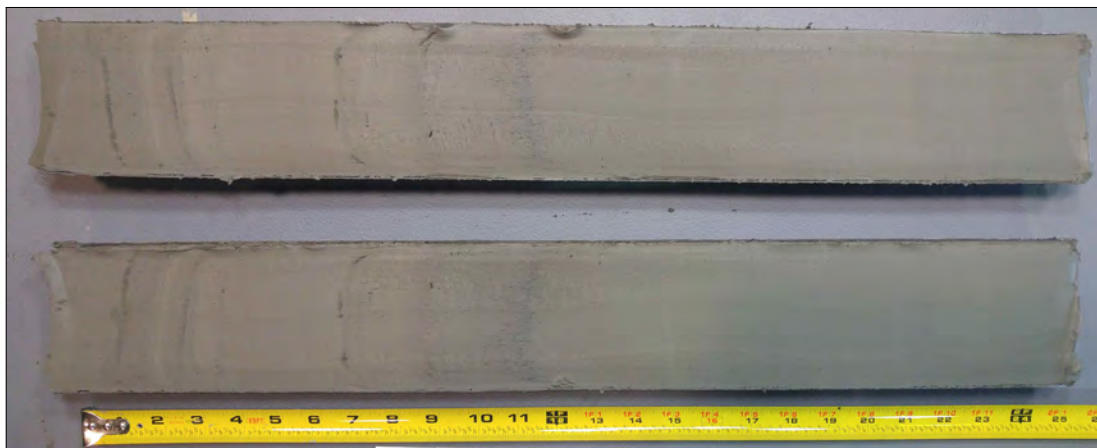
WF17-01(d2)
Depth Below Mudline 2'-4'



WF17-01(d1)
Depth Below Mudline 4'-5'



WF17-01(c3)
Depth Below Mudline 5'-7'



WF17-01(c2)
Depth Below Mudline 7'-9'



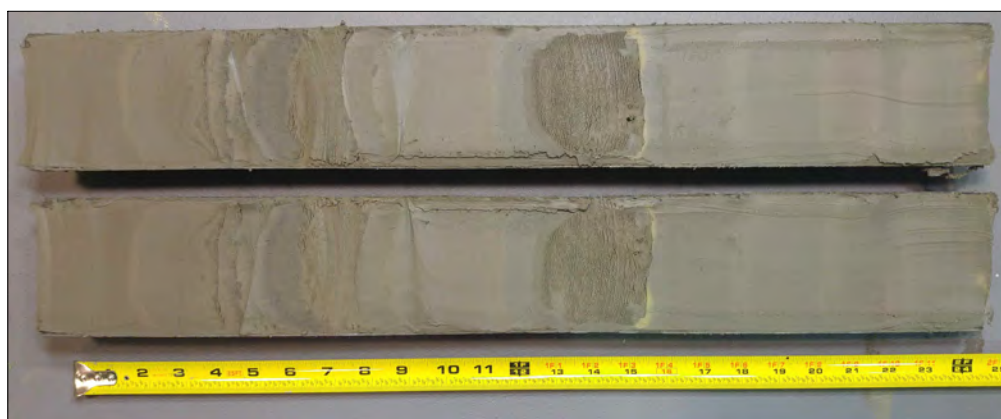
WF17-01(c1)
Depth Below Mudline 9'-10'

Top

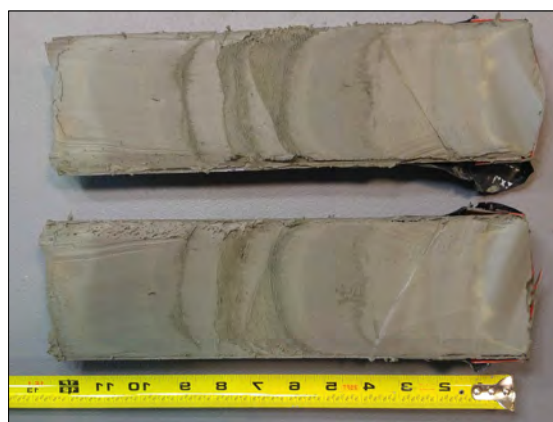
Bottom



WF17-01(b3)
Depth Below Mudline 10'-12'



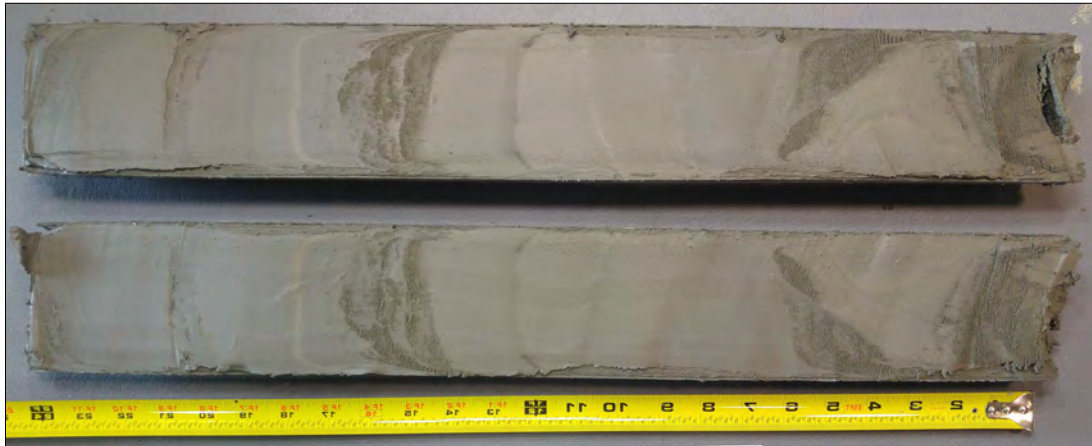
WF17-01(b2)
Depth Below Mudline 12'-14'



WF17-01(b1)
Depth Below Mudline 14'-15'



WF17-01(a3)
Depth Below Mudline 15'-17'



WF17-01(a2)
Depth Below Mudline 17'-19'



WF17-01(a1)
Depth Below Mudline 19'-20'

Top

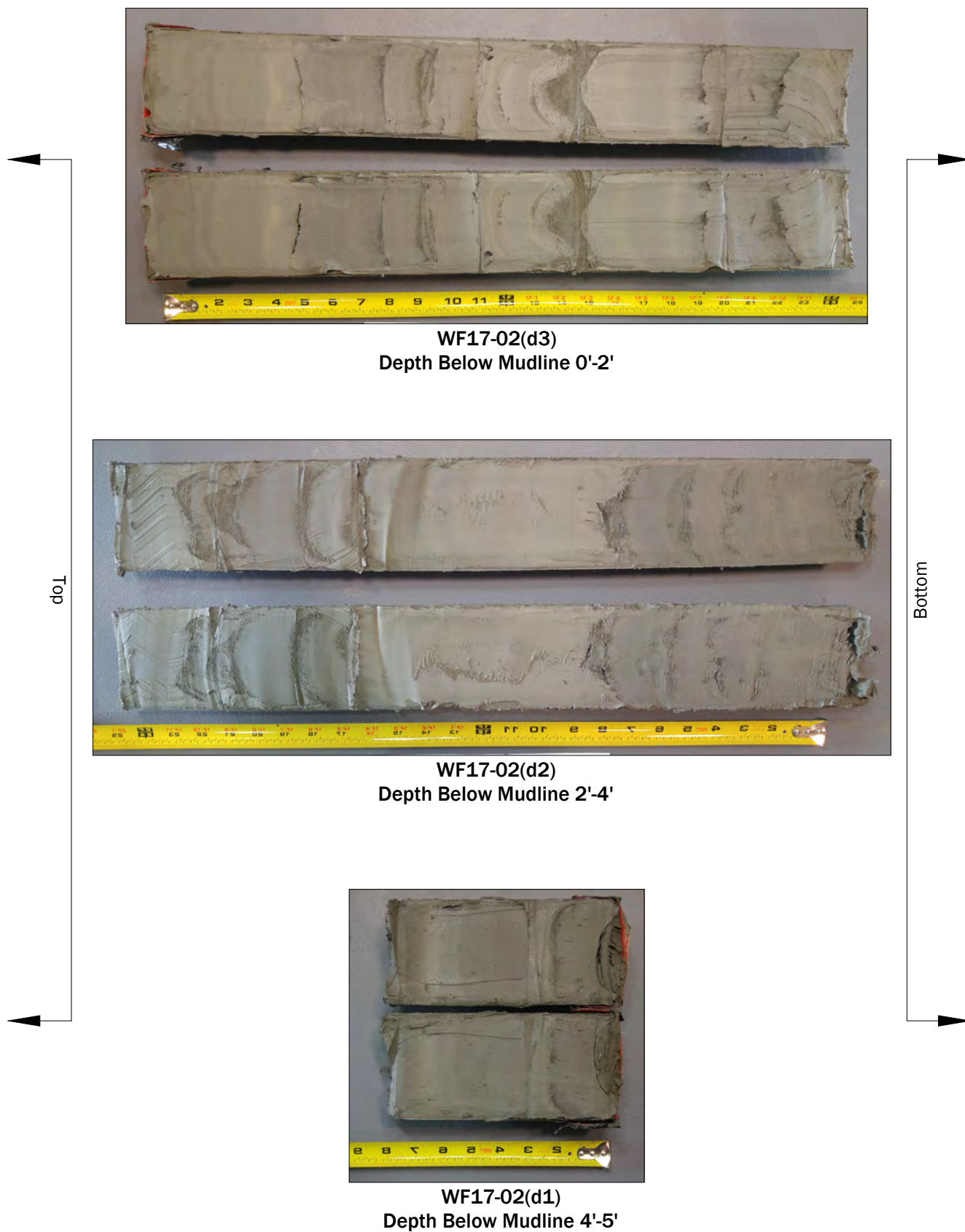
Bottom

Photo Log
WF17-01

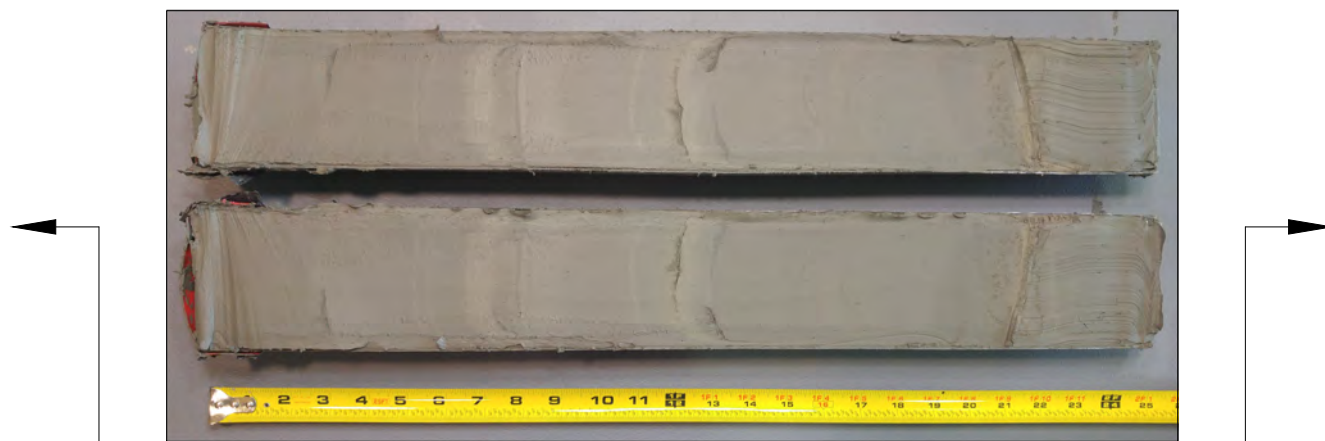
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Figure A-4







WF17-02(b3)
Depth Below Mudline 10'-12'



WF17-02(b2)
Depth Below Mudline 12'-14'



WF17-02(b1)
Depth Below Mudline 14'-15'

Top

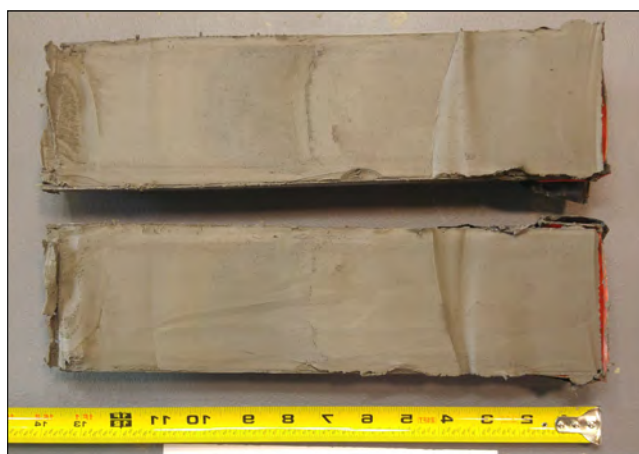
Bottom



WF17-02(a3)
Depth Below Mudline 15'-17'



WF17-02(a2)
Depth Below Mudline 17'-19'



WF17-02(a1)
Depth Below Mudline 19'-20'

Top

Bottom

Photo Log
WF17-02

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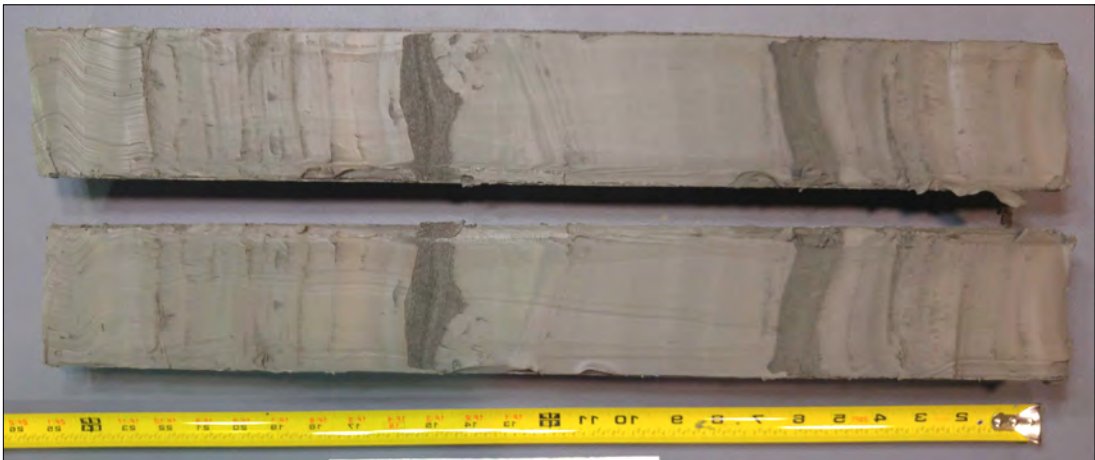
Figure A-8

Top

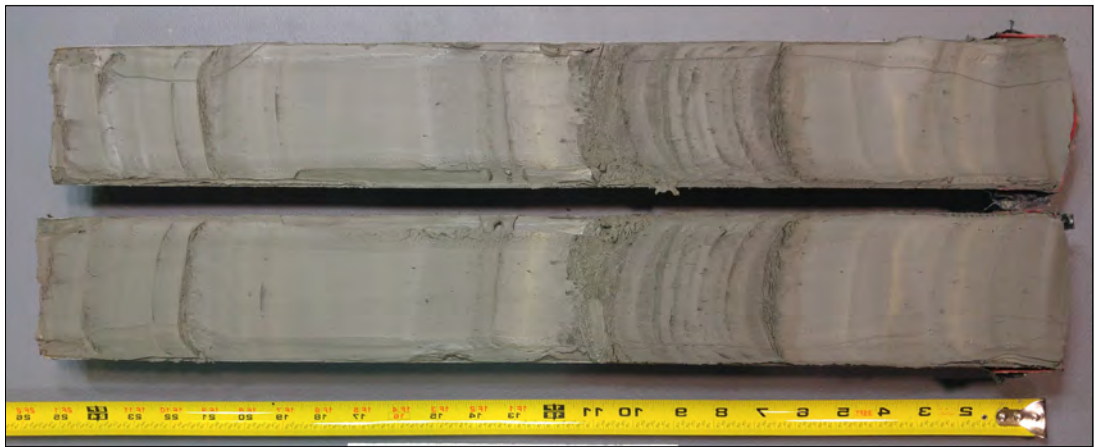
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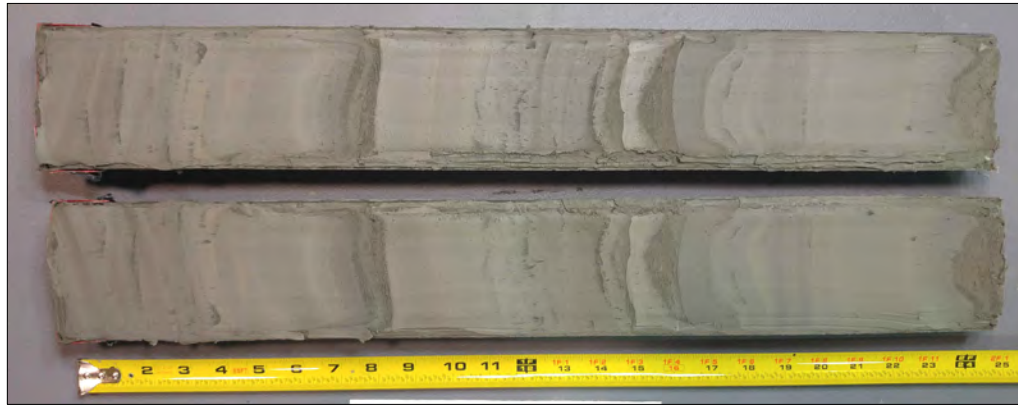
WF17-03(d3)
Depth Below Mudline 0'-1'



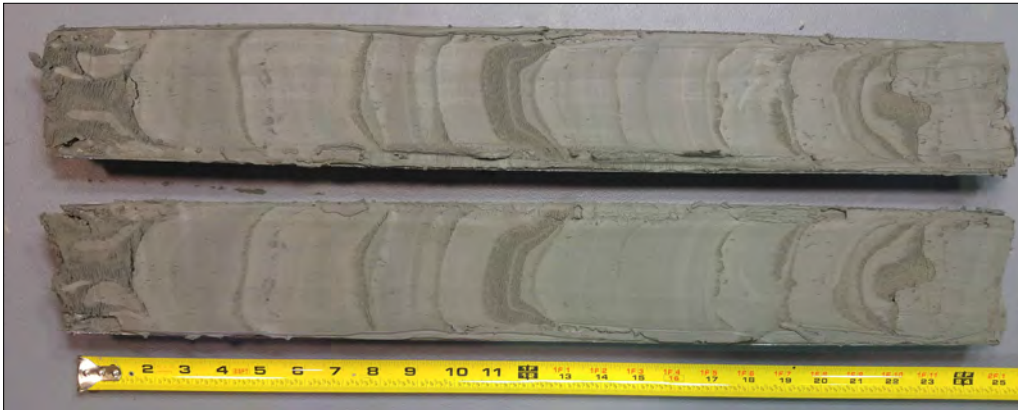
WF17-03(d2)
Depth Below Mudline 1'-3'



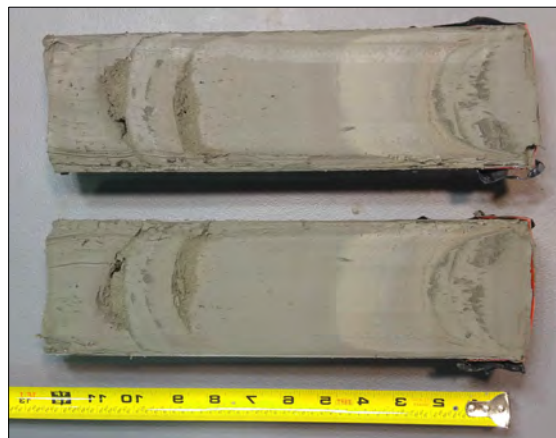
WF17-03(d1)
Depth Below Mudline 3'-5'



WF17-03(c3)
Depth Below Mudline 5'-7'



WF17-03(c2)
Depth Below Mudline 7'-9'



WF17-03(c1)
Depth Below Mudline 9'-10'

Top

Bottom

Photo Log
WF17-03

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Figure A-10

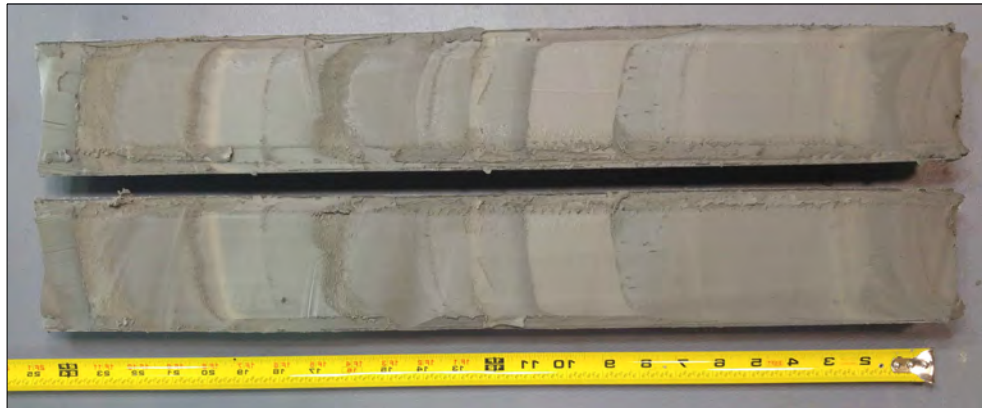


Top

Bottom



WF17-03(a3)
Depth Below Mudline 15'-17'



WF17-03(a2)
Depth Below Mudline 17'-19'



WF17-03(a1)
Depth Below Mudline 19'-20'

Photo Log
WF17-03

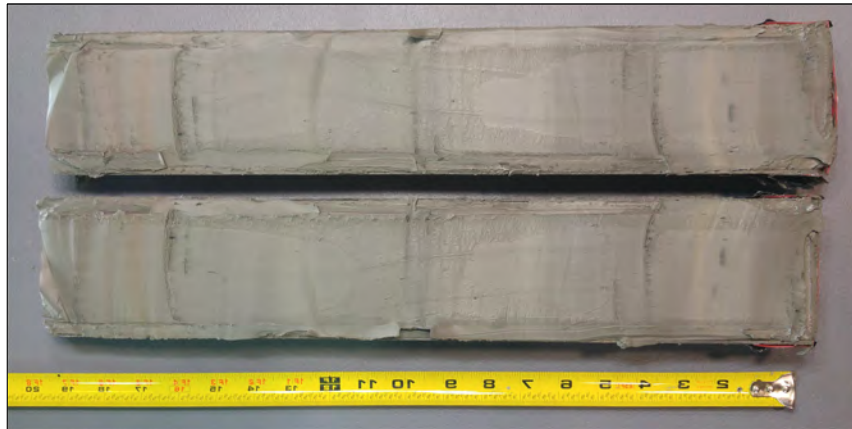
West Fourchon Marsh Creation and
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Figure A-12



WF17-04(d2)
Depth Below Mudline 0'-2'



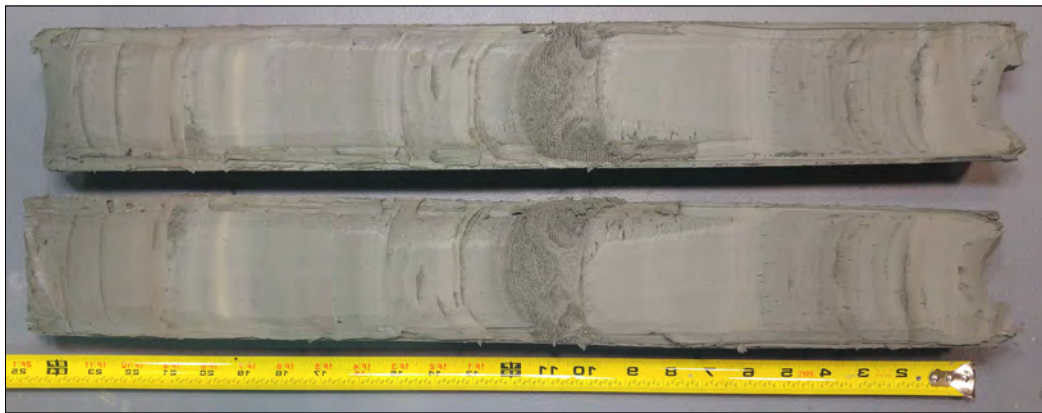
WF17-04(d1)
Depth Below Mudline 2'-3.5'

Top

Bottom



WF17-04c3
Depth Below Mudline 3.5'-5.5'



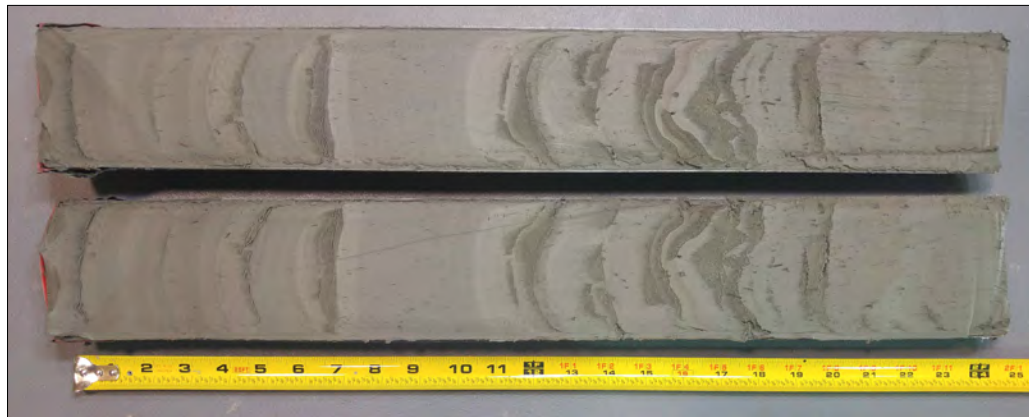
WF17-04c2
Depth Below Mudline 5.5'-7.5'



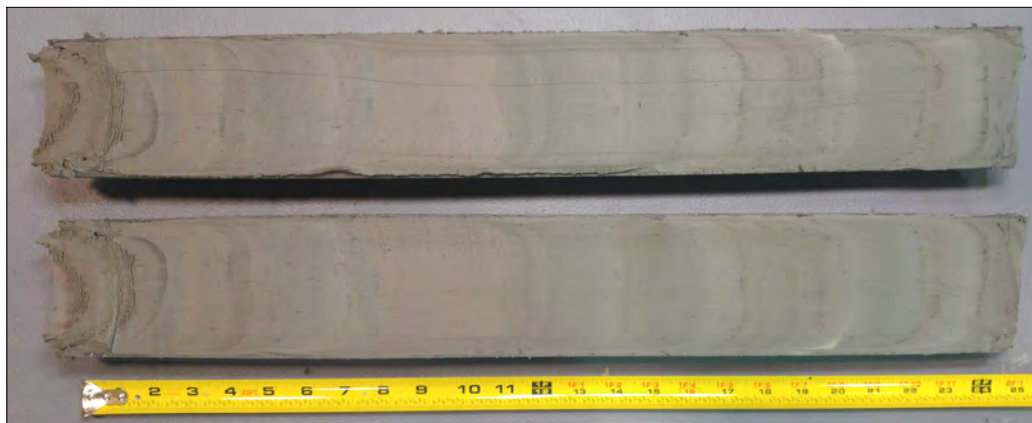
WF17-04c1
Depth Below Mudline 7.5'-8.5'

Top

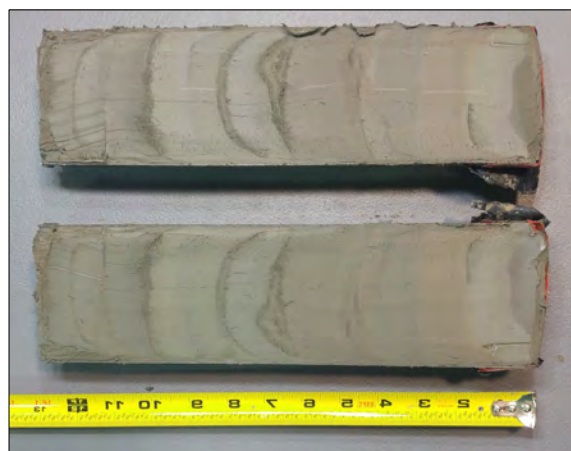
Bottom



WF17-04(b3)
Depth Below Mudline 8.5'-10.5'



WF17-04(b2)
Depth Below Mudline 10.5'-12.5'



WF17-04(b1)
Depth Below Mudline 12.5'-13.5'

Top

Bottom

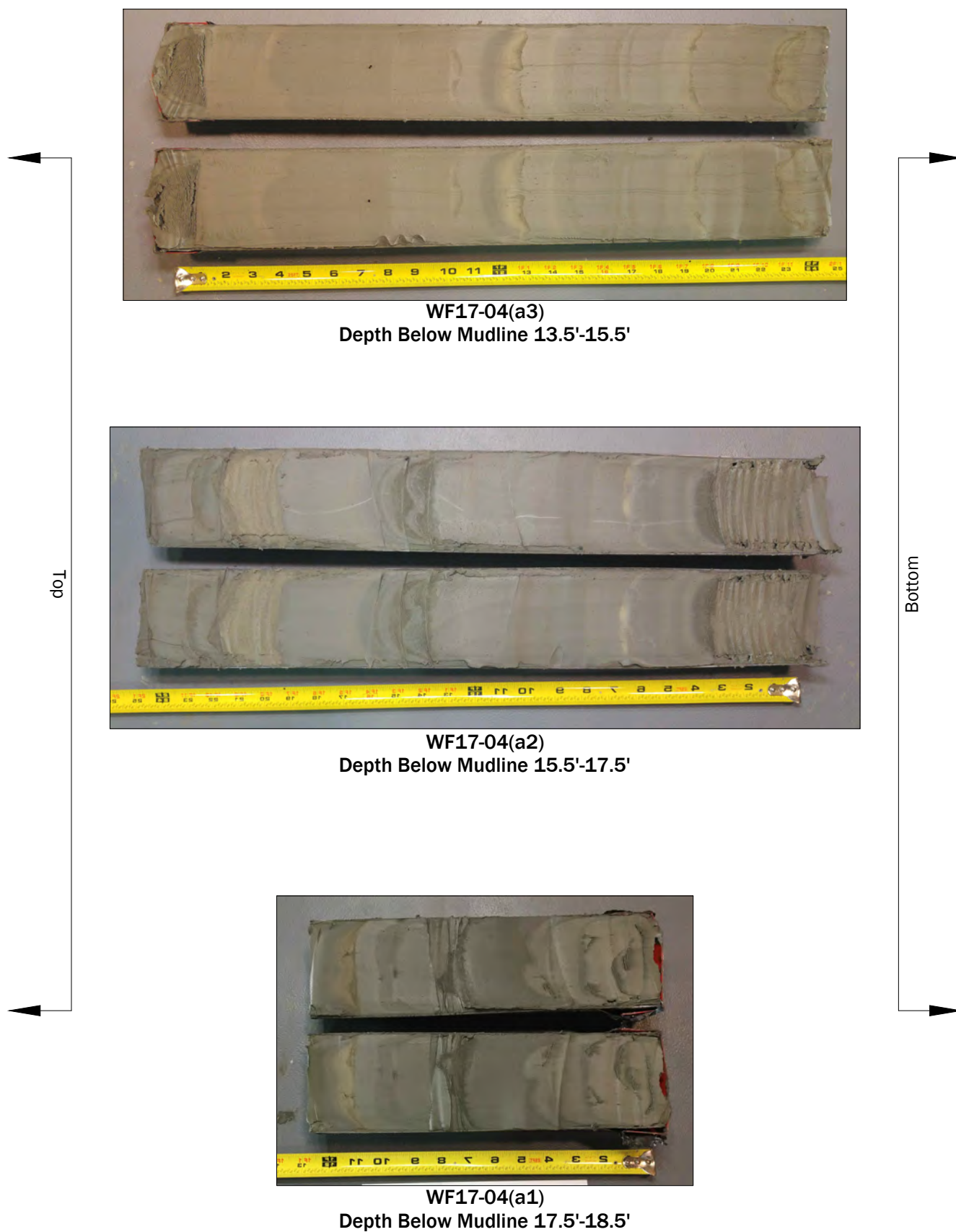


Photo Log
WF17-04

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Figure A-16



WF17-05(c3)
Depth Below Mudline 0'-2'



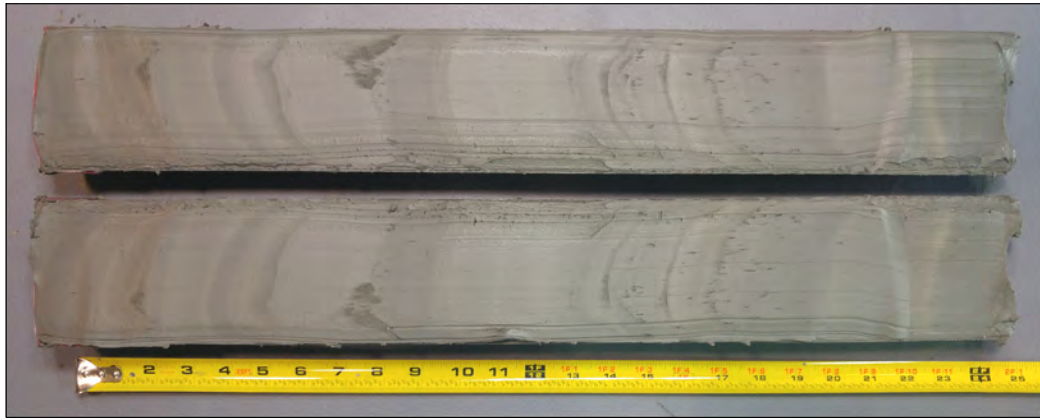
WF17-05(c2)
Depth Below Mudline 2'-4'



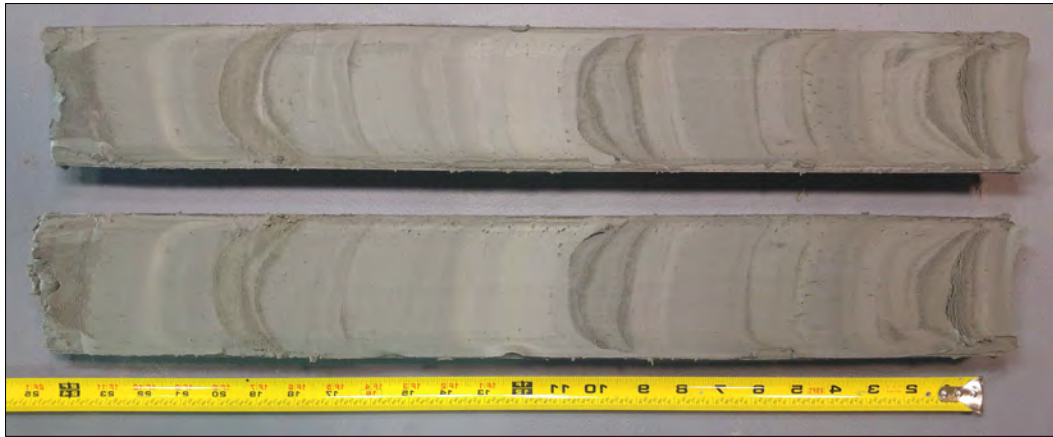
WF17-05(c1)
Depth Below Mudline 4'-6'

Top

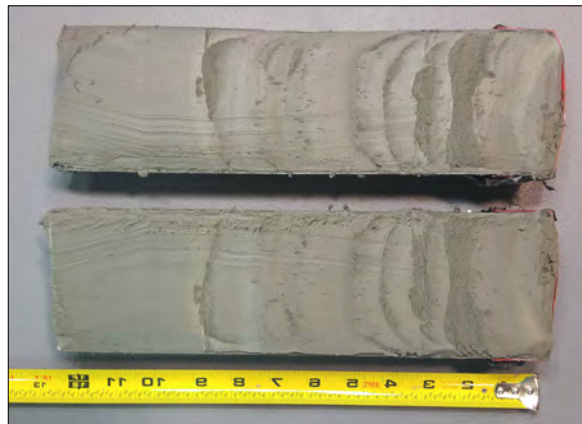
Bottom



WF17-05(b3)
Depth Below Mudline 6'-8'



WF17-05(b2)
Depth Below Mudline 8'-10'



WF17-05(b1)
Depth Below Mudline 10'-11'

Top

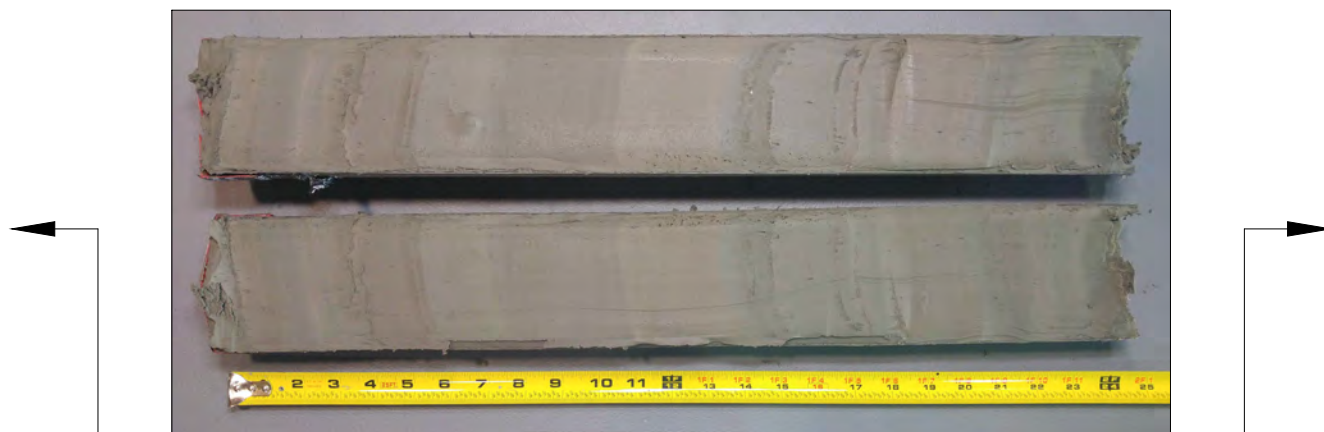
Bottom

Photo Log
WF17-05

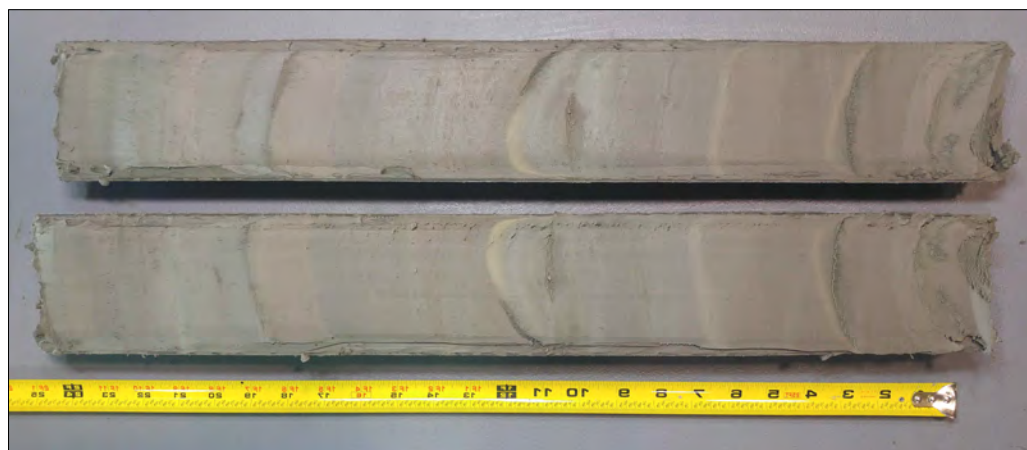
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Figure A-18



WF17-05(a3)
Depth Below Mudline 11'-13'



WF17-05(a2)
Depth Below Mudline 13'-15'

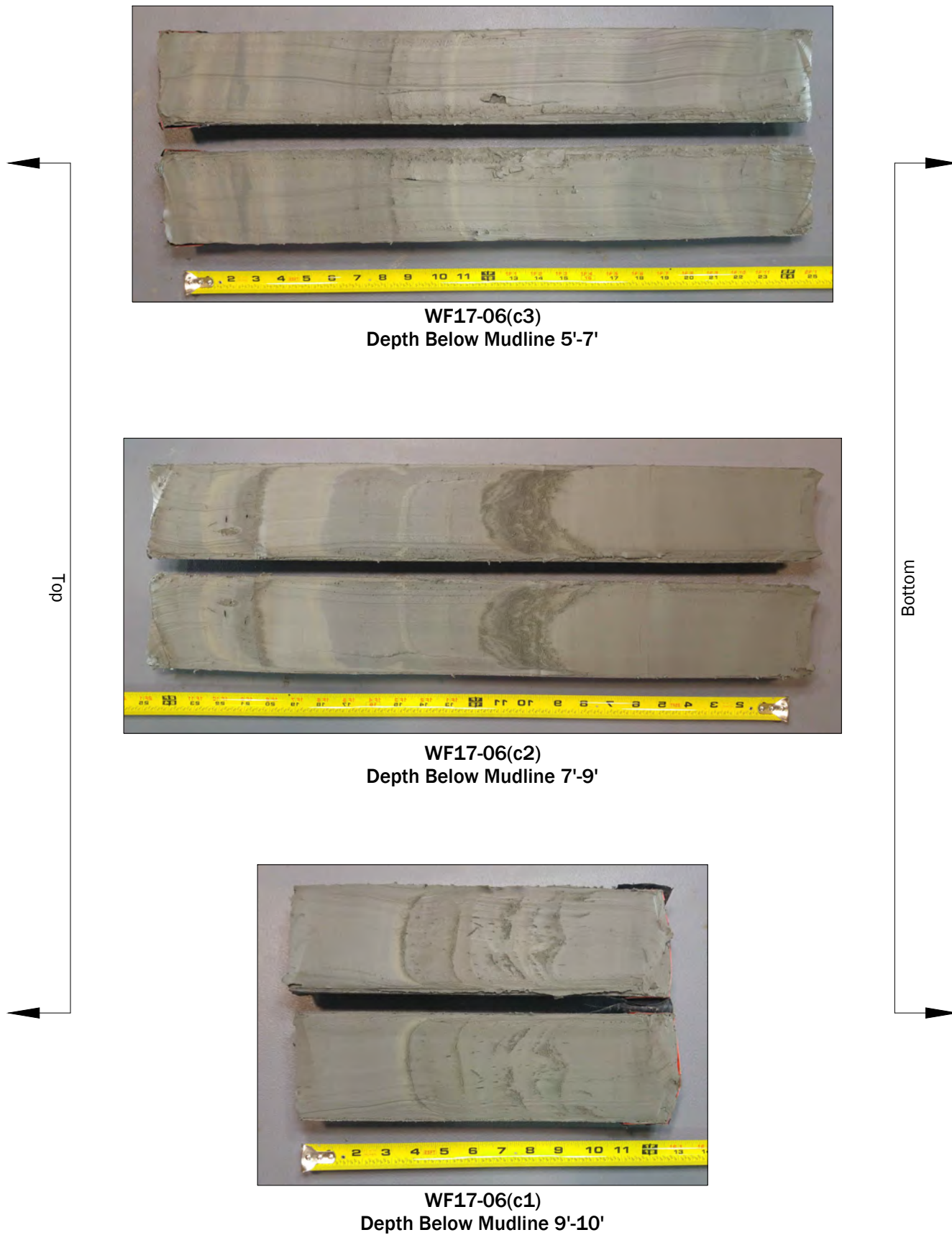


WF17-05(a1)
Depth Below Mudline 15'-16'

Top

Bottom



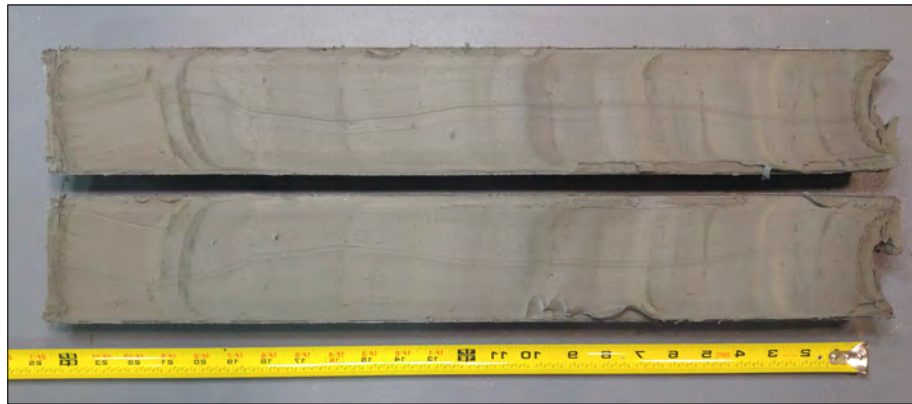


Top

Bottom



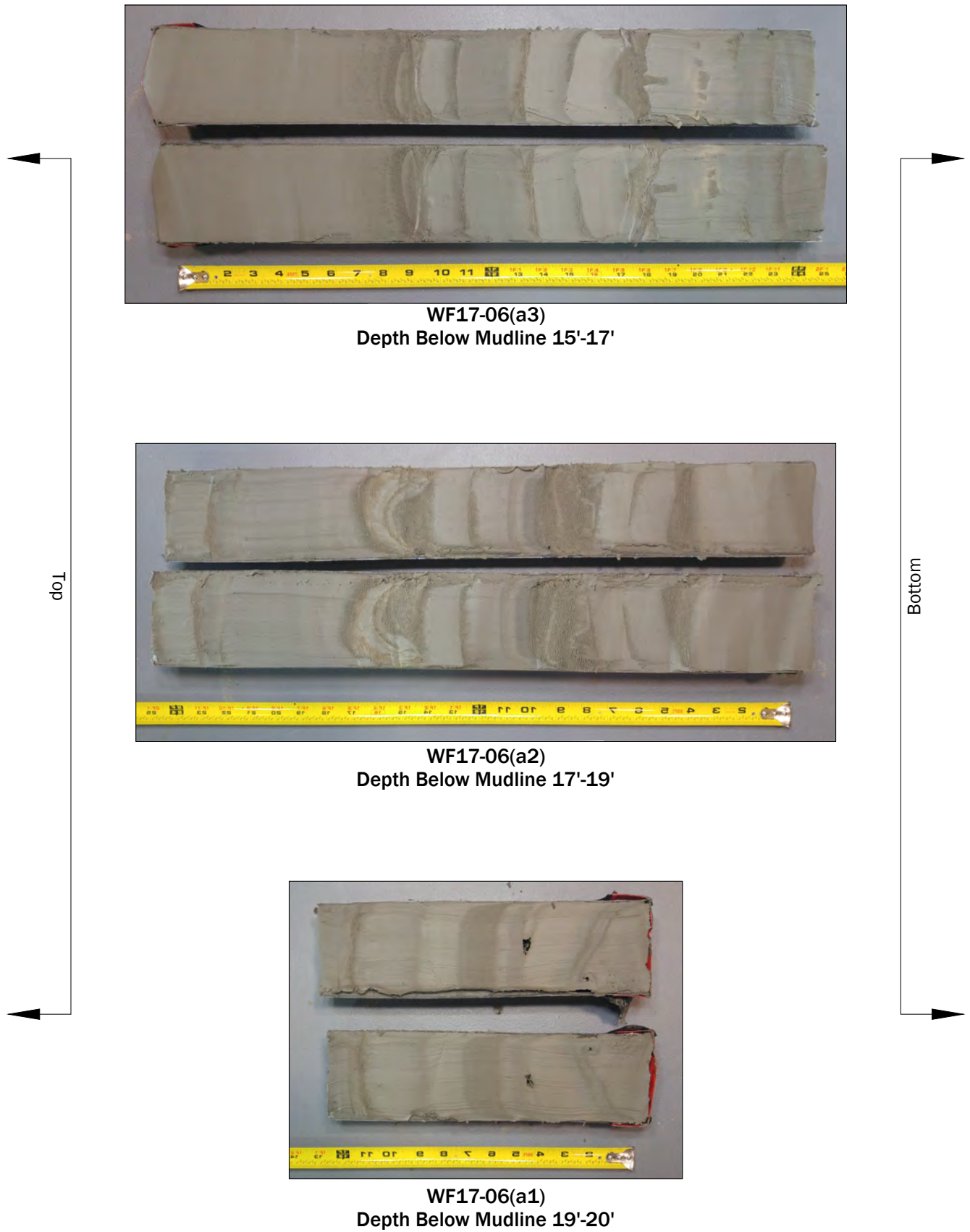
WF17-06(b3)
Depth Below Mudline 10'-12'



WF17-06(b2)
Depth Below Mudline 12'-14'



WF17-06(b1)
Depth Below Mudline 14'-15'







WF17-07(c3)
Depth Below Mudline 5'-7'



WF17-07(c2)
Depth Below Mudline 7'-9'



WF17-07(c1)
Depth Below Mudline 9'-10'

Top

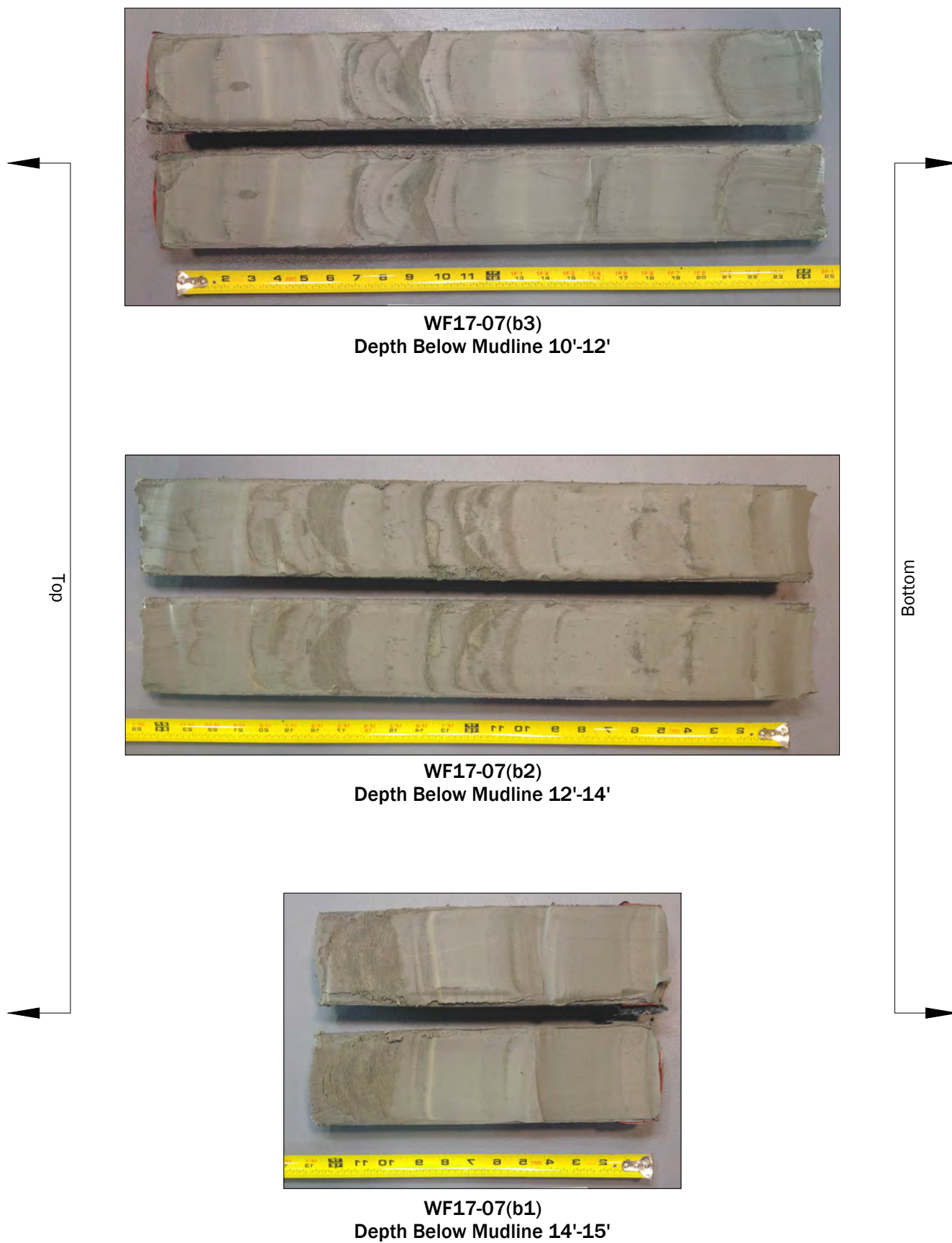
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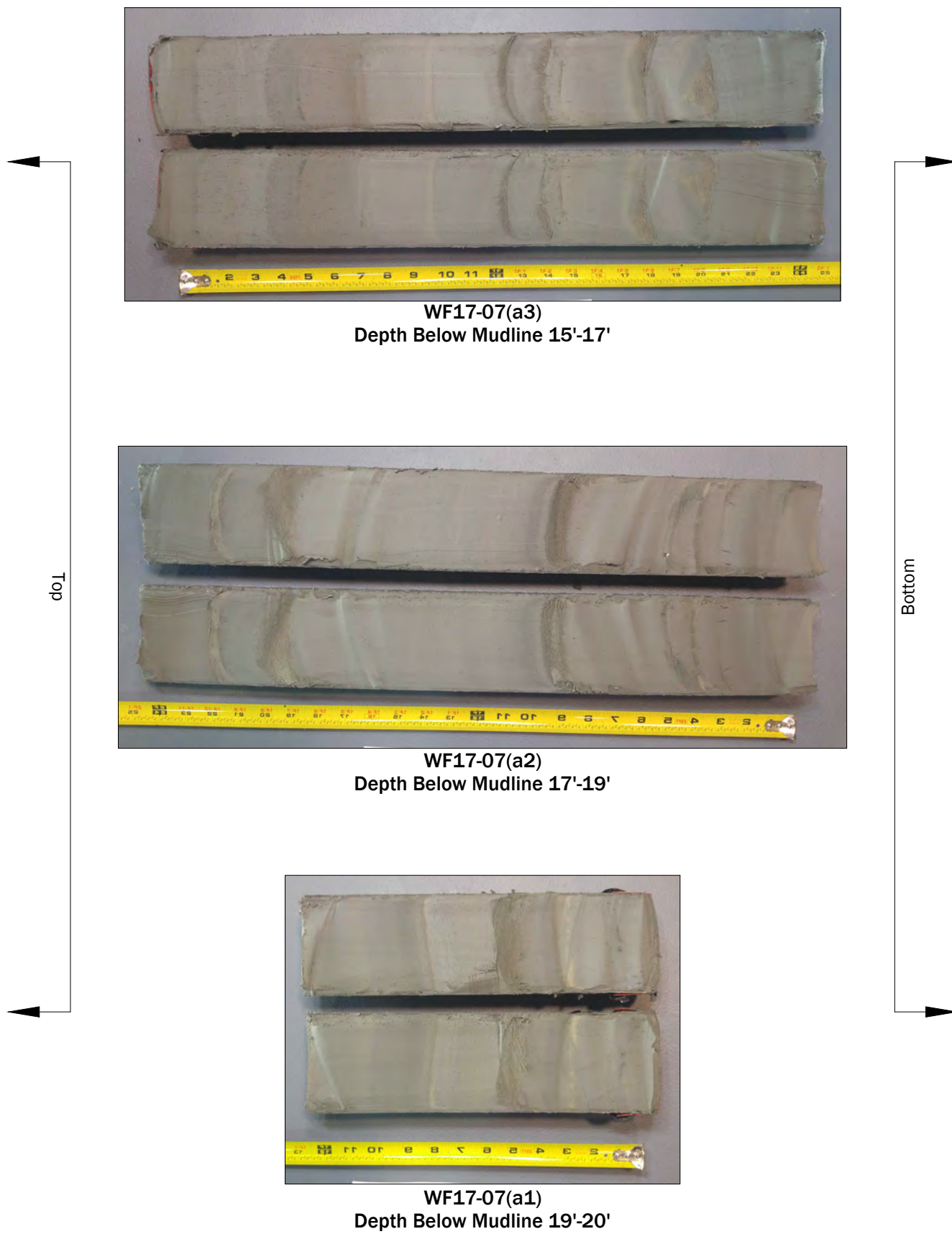
Photo Log
WF17-07

West Fourchon Marsh Creation and
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Figure A-25





Top

Bottom



WF17-08(d3)
Depth Below Mudline 0'-2'



WF17-08(d2)
Depth Below Mudline 2'-4'



WF17-08(d1)
Depth Below Mudline 4'-5'

Top

Bottom



WF17-08(c3)
Depth Below Mudline 5'-7'



WF17-08(c2)
Depth Below Mudline 7'-9'



WF17-08(c1)
Depth Below Mudline 9'-10'



WF17-08(b3)
Depth Below Mudline 10'-12'



WF17-08(b2)
Depth Below Mudline 12'-14'



WF17-08(b1)
Depth Below Mudline 14'-15'

Top

Bottom



WF17-08(a3)
Depth Below Mudline 15'-17'



WF17-08(a2)
Depth Below Mudline 17'-19'



WF17-08(a1)
Depth Below Mudline 19'-20'

Top



WF17-09(d2)
Depth Below Mudline 0'-2'



WF17-09(d1)
Depth Below Mudline 2'-4'

Bottom



WF17-09(c3)
Depth Below Mudline 4'-6'



WF17-09(c2)
Depth Below Mudline 6'-8'



WF17-09(c1)
Depth Below Mudline 8'-9'

Top

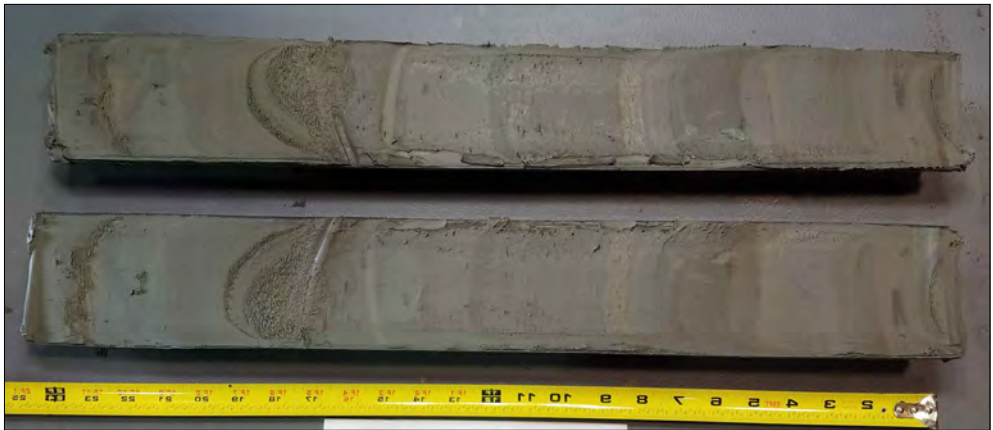
Bottom

Top

Bottom



WF17-09(b3)
Depth Below Mudline 9'-11'



WF17-09(b2)
Depth Below Mudline 11'-13'



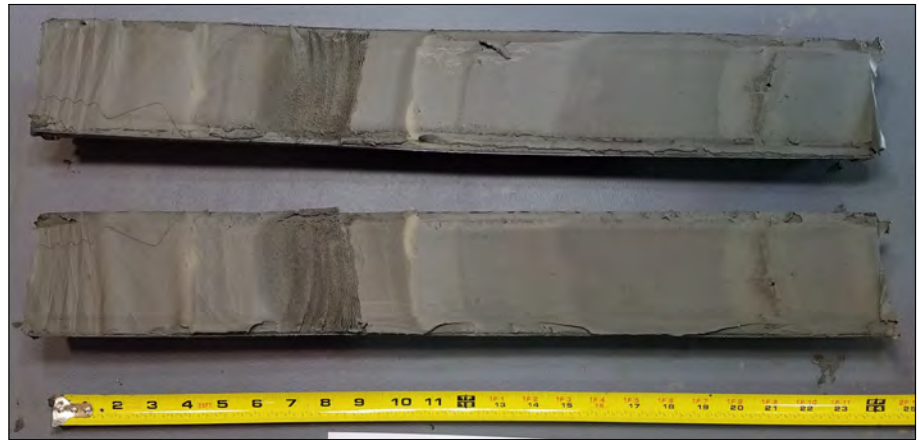
WF17-09(b1)
Depth Below Mudline 13'-14'

Top

Bottom



WF17-09(a3)
Depth Below Mudline 14'-16'



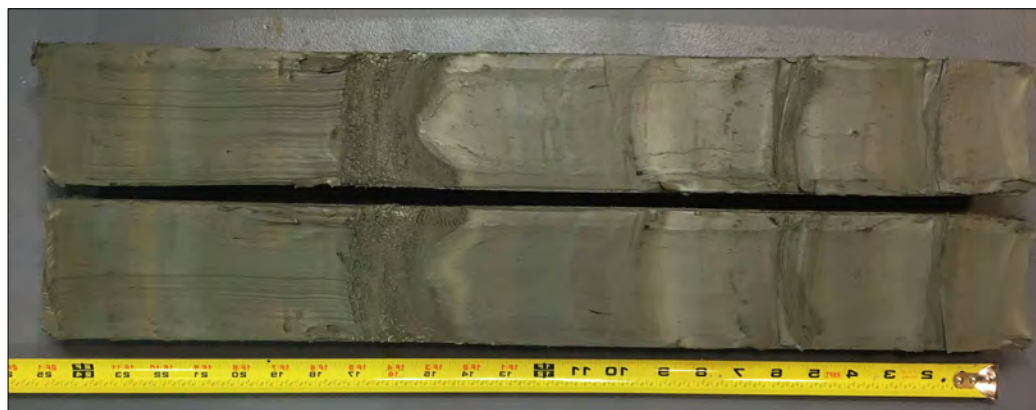
WF17-09(a2)
Depth Below Mudline 16'-18'



WF17-09(a1)
Depth Below Mudline 18'-19'



WF17-10(d3)
Depth Below Mudline 0'-2'



WF17-10(d2)
Depth Below Mudline 2'-4'



WF17-10(d1)
Depth Below Mudline 4'-5'

Top

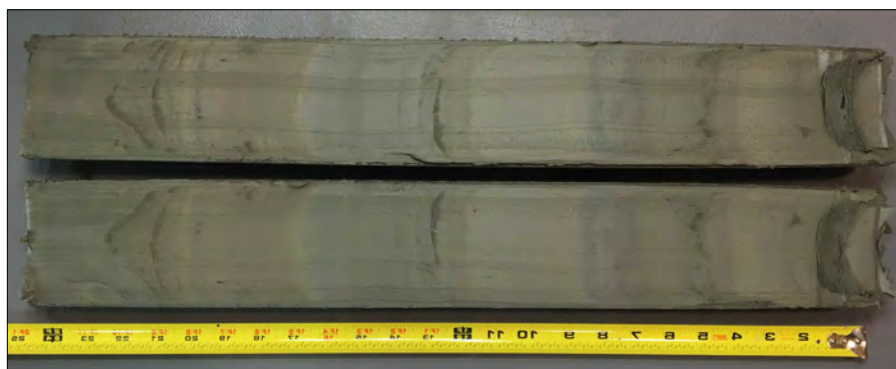
Bottom

Top

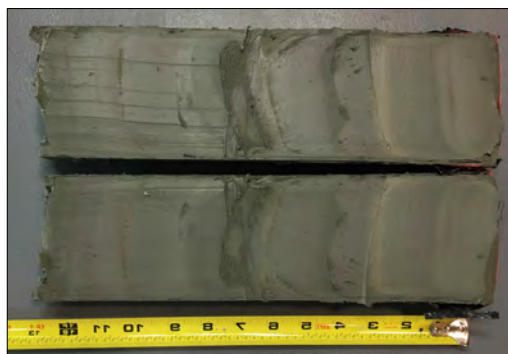
Bottom



WF17-10(c3)
Depth Below Mudline 5'-7'



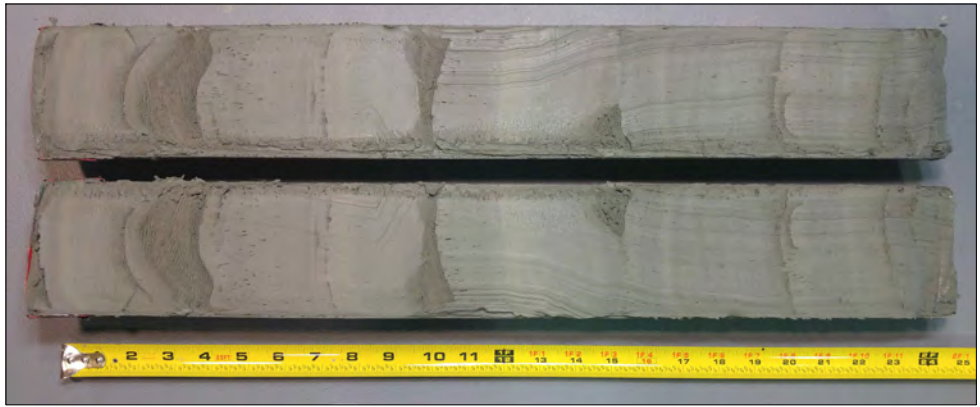
WF17-10(c2)
Depth Below Mudline 7'-9'



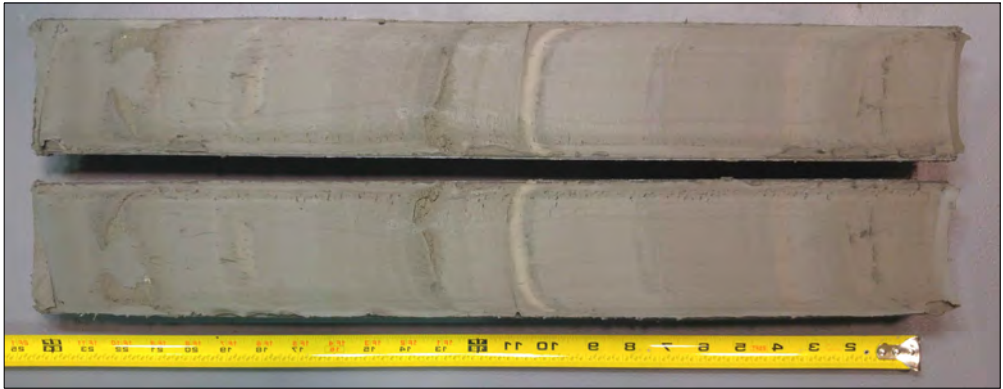
WF17-10(c1)
Depth Below Mudline 9'-10'

Top

Bottom



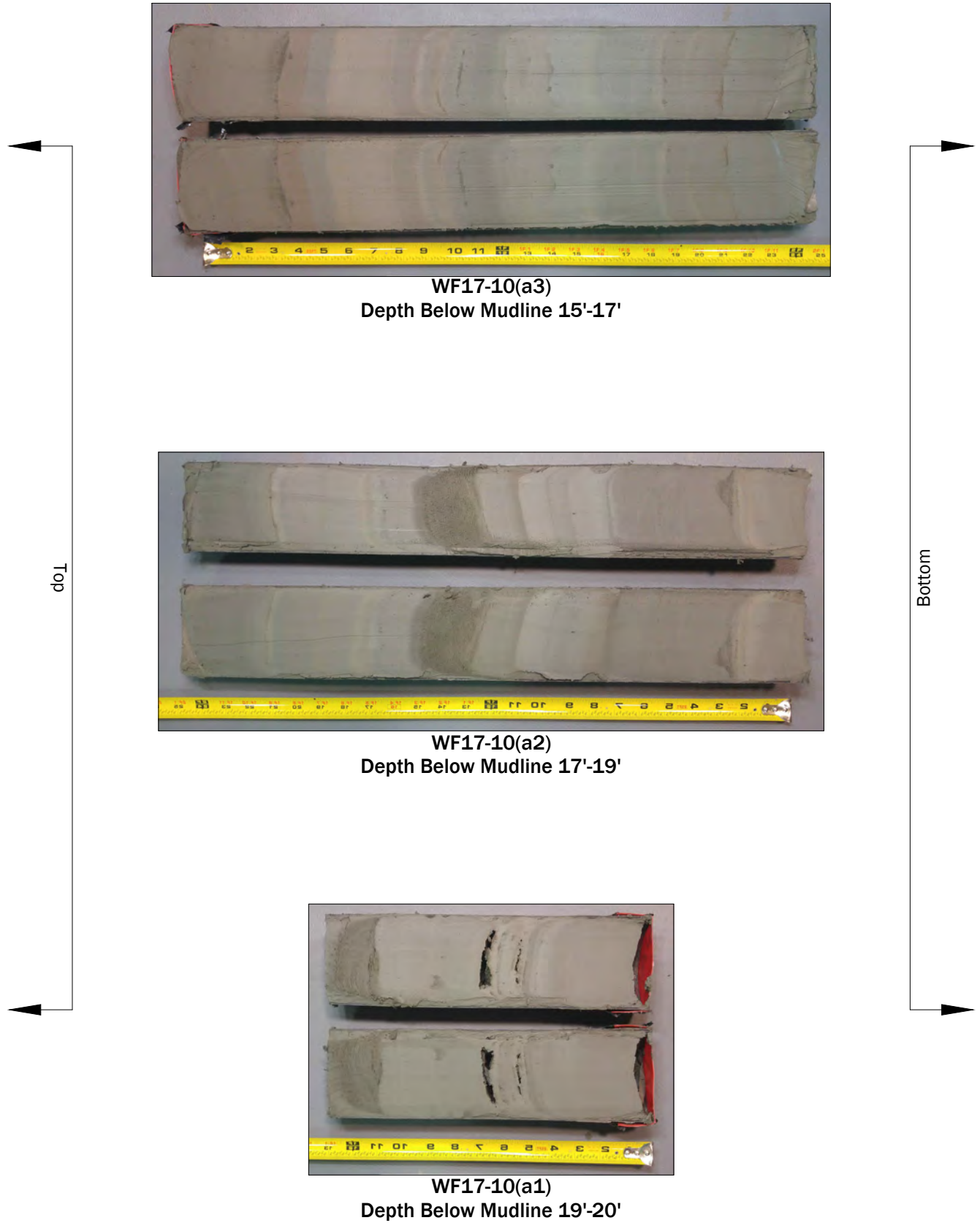
WF17-10(b3)
Depth Below Mudline 10'-12'

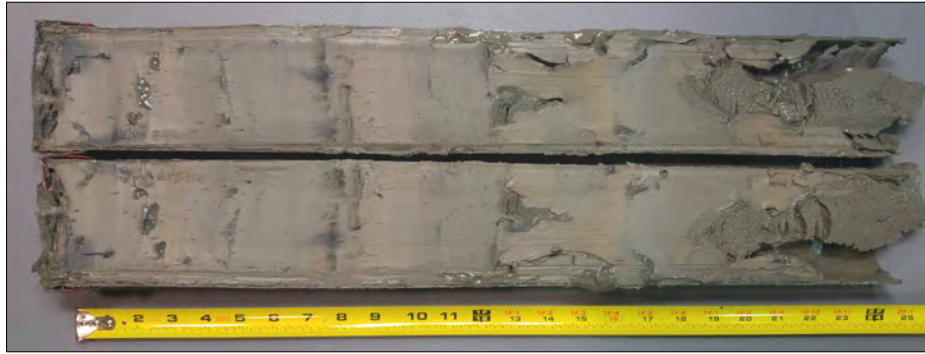


WF17-10(b2)
Depth Below Mudline 12'-14'

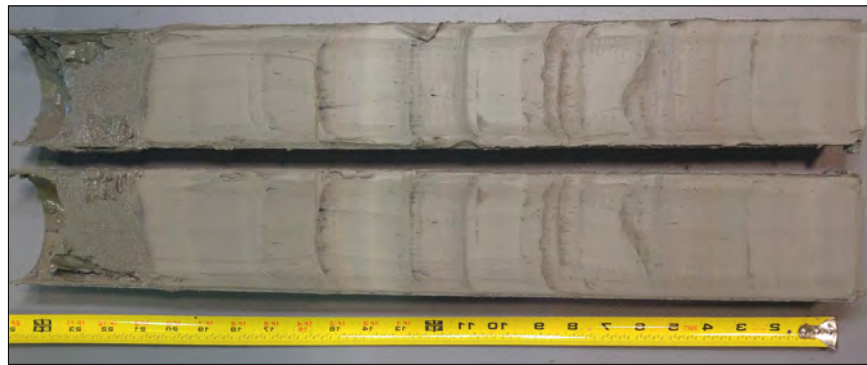


WF17-10(b1)
Depth Below Mudline 14'-15'





WF17-11(d3)
Depth Below Mudline 0'-2'



WF17-11(d2)
Depth Below Mudline 2'-4'



WF17-11(d1)
Depth Below Mudline 4'-5'

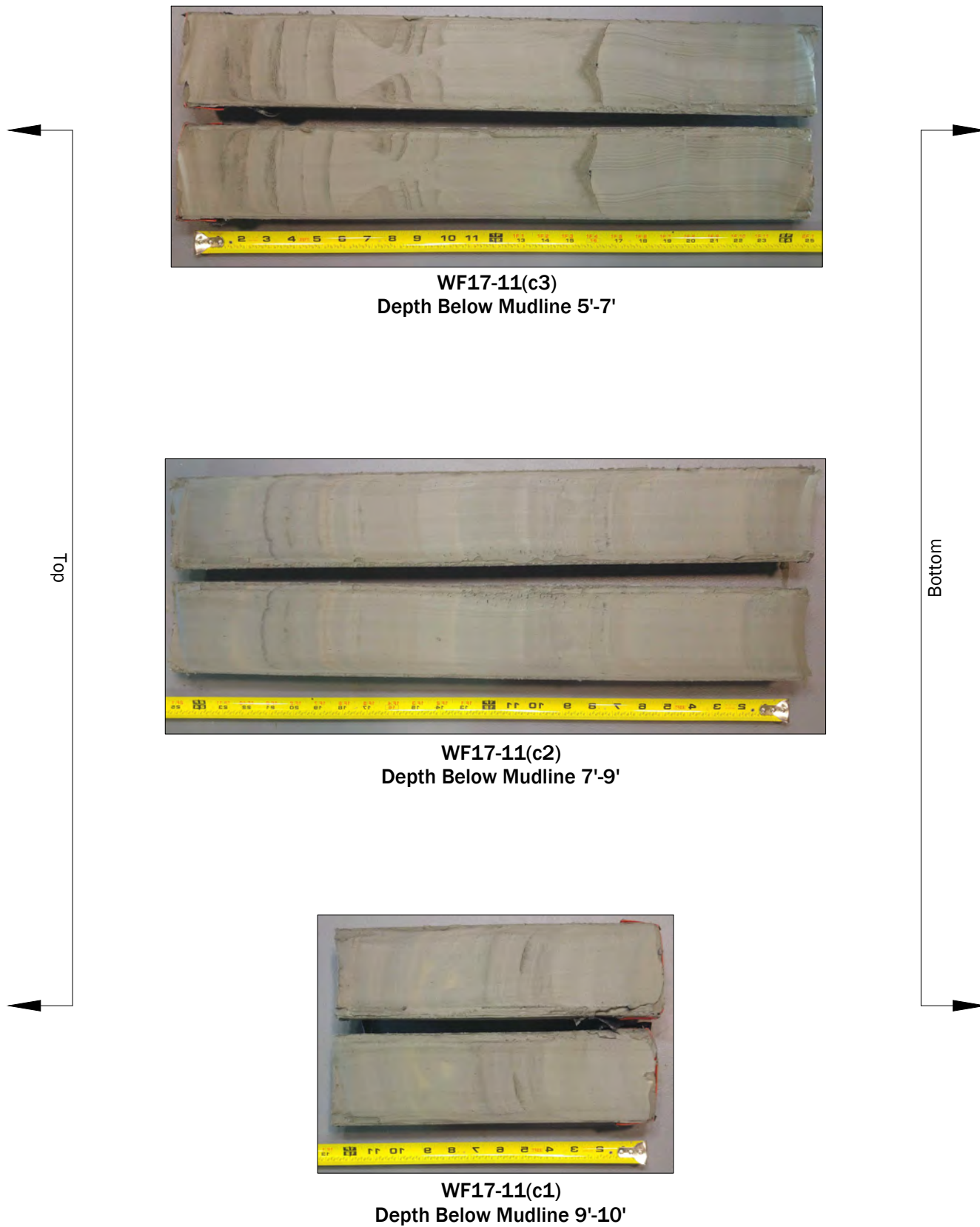


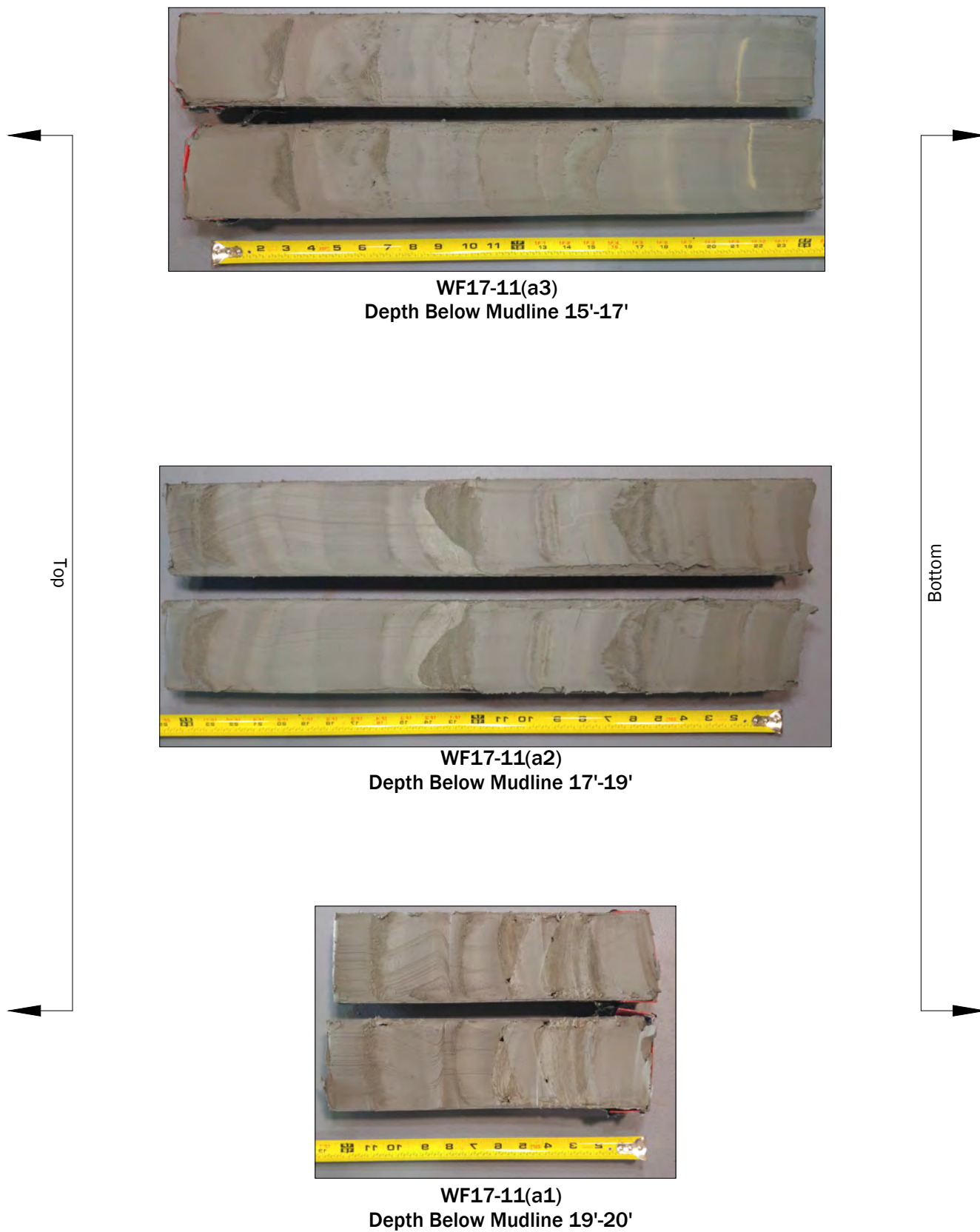


Photo Log
WF17-11

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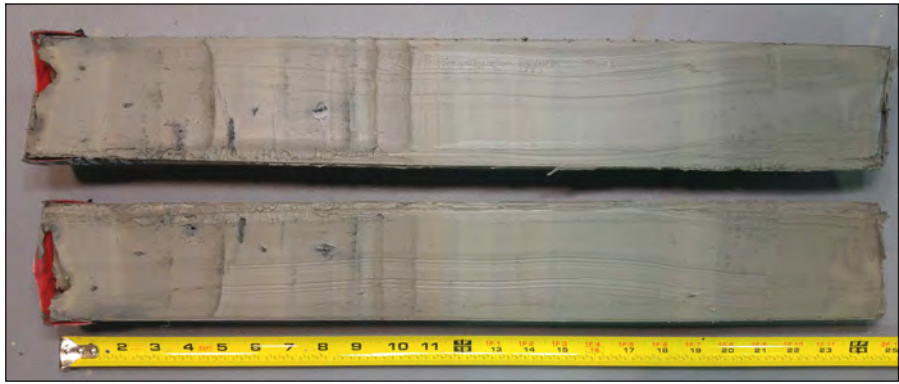


Figure A-42

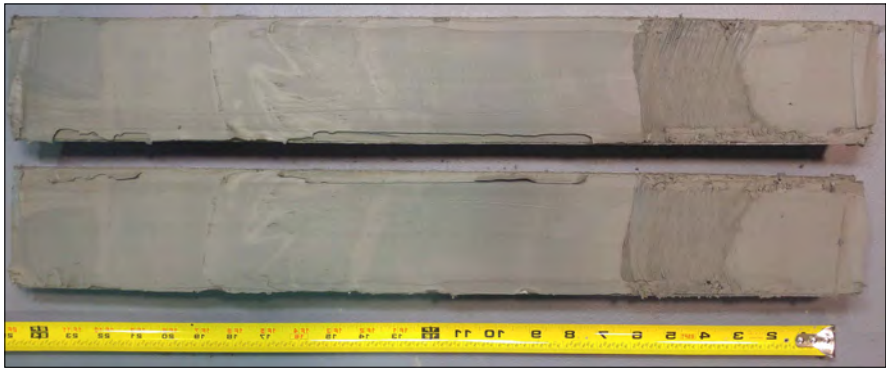


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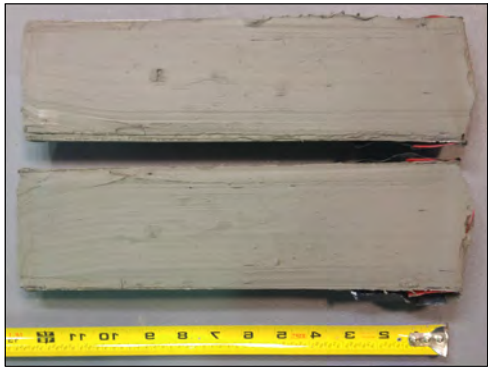
Bottom



WF17-12(d3)
Depth Below Mudline 0'-2'



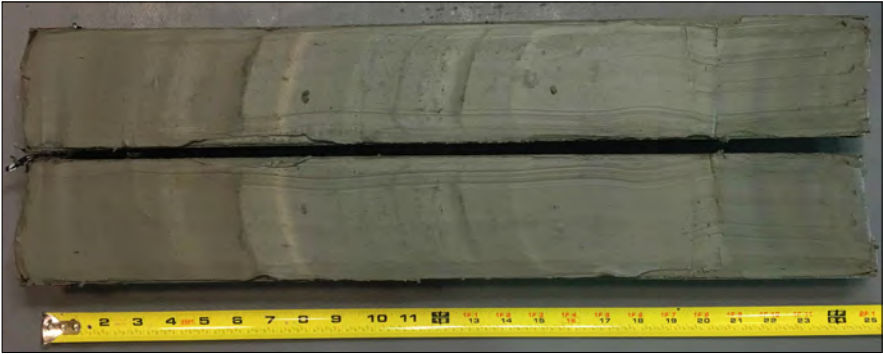
WF17-12(d2)
Depth Below Mudline 2'-4'



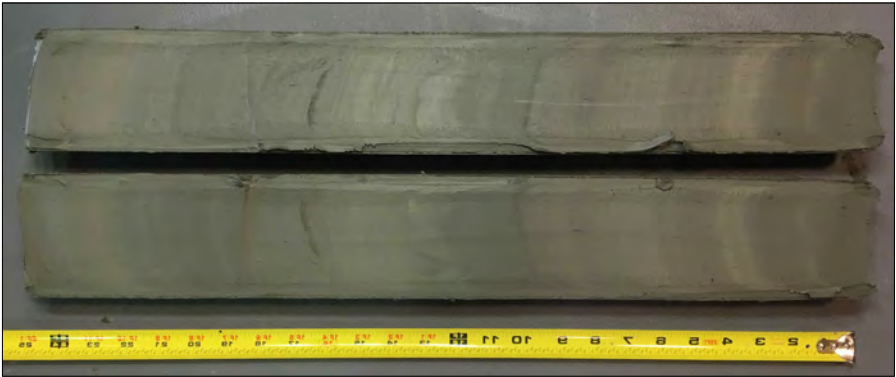
WF17-12(d1)
Depth Below Mudline 4'-5'

Top

Bottom



WF17-12(c3)
Depth Below Mudline 5'-7'



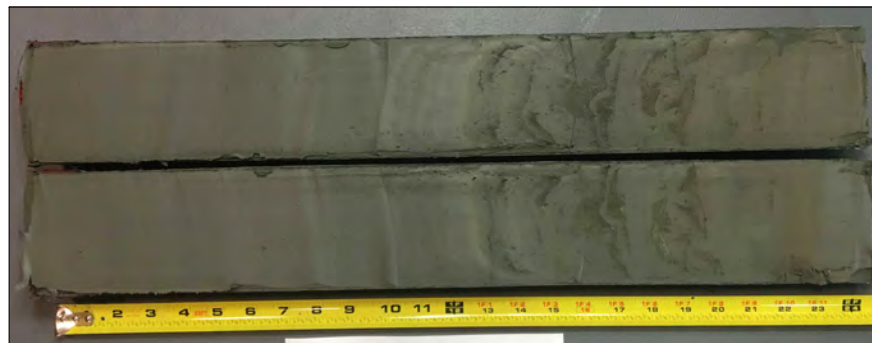
WF17-12(c2)
Depth Below Mudline 7'-9'



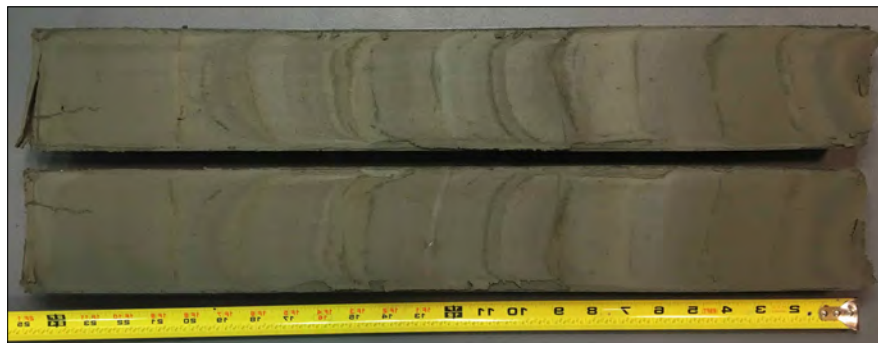
WF17-12(c1)
Depth Below Mudline 9'-10'

Top

Bottom



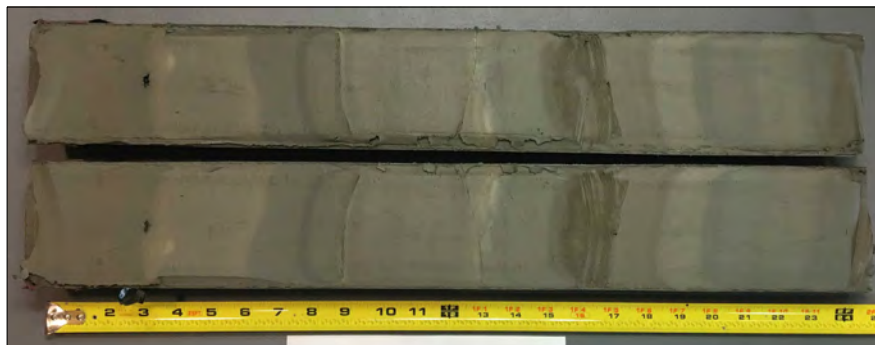
WF17-12(b3)
Depth Below Mudline 10'-12'



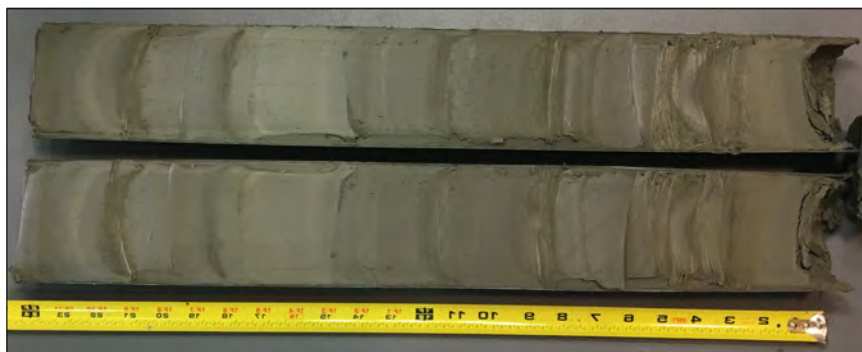
WF17-12(b2)
Depth Below Mudline 12'-14'



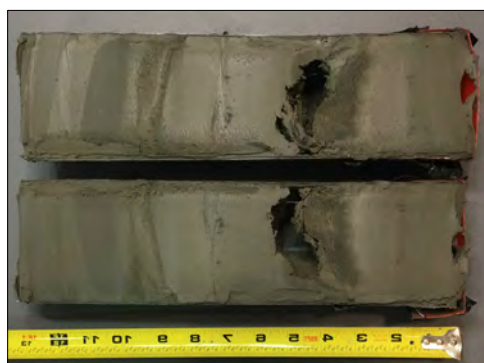
WF17-12(b1)
Depth Below Mudline 14'-15'



WF17-12(a3)
Depth Below Mudline 15'-17'



WF17-12(a2)
Depth Below Mudline 17'-19'



WF17-12(a1)
Depth Below Mudline 19'-20'

Top

Bottom

Top

Bottom



WF17-13(d3)
Depth Below Mudline 0'-2'



WF17-13(d2)
Depth Below Mudline 2'-4'



WF17-13(d1)
Depth Below Mudline 4'-5'

Top

Bottom



WF17-13(c3)
Depth Below Mudline 5'-7'



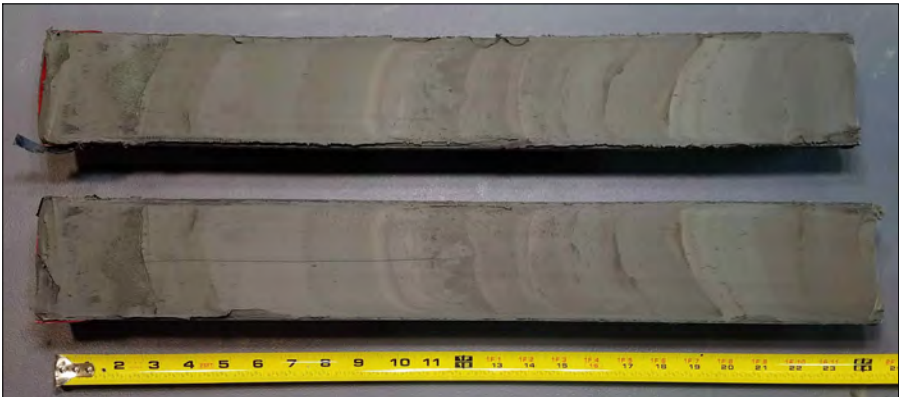
WF17-13(c2)
Depth Below Mudline 7'-9'



WF17-13(c1)
Depth Below Mudline 9'-10'

Top

Bottom



WF17-13(b3)
Depth Below Mudline 10'-12'



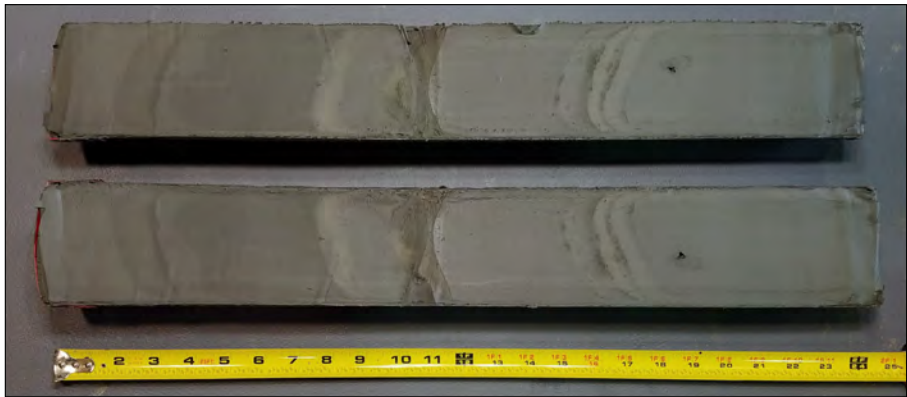
WF17-13(b2)
Depth Below Mudline 12'-14'



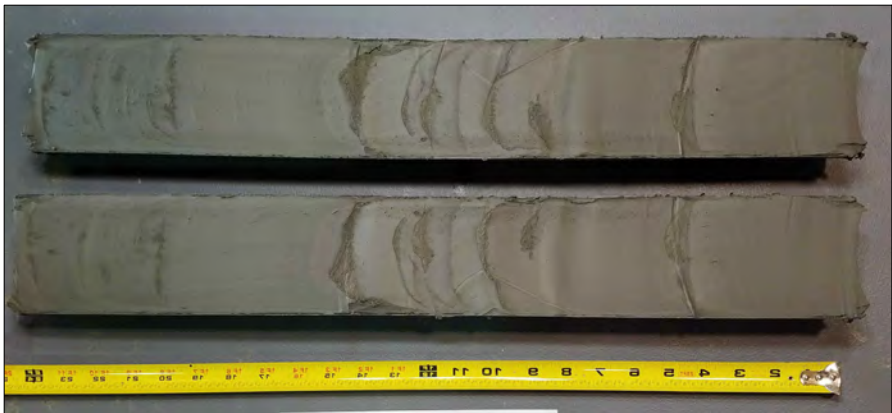
WF17-13(b1)
Depth Below Mudline 14'-15'

Top

Bottom



WF17-13a3
Depth Below Mudline 15'-17'



WF17-13a2
Depth Below Mudline 17'-19'



WF17-13a1
Depth Below Mudline 19'-20'

APPENDIX B

Vibracore Logs and Laboratory Testing Data

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS	
			GRAPH	LETTER		
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES	
		(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES	
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES	
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES	
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS
			(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND
SANDS WITH FINES				SM	SILTY SANDS, SAND - SILT MIXTURES	
(APPRECIABLE AMOUNT OF FINES)				SC	CLAYEY SANDS, SAND - CLAY MIXTURES	
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY	
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
					CH	INORGANIC CLAYS OF HIGH PLASTICITY
					OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

Sampler Symbol Descriptions

	2.4-inch I.D. split barrel
	Standard Penetration Test (SPT)
	Shelby tube
	Piston
	Direct-Push
	Bulk or grab
	Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS		TYPICAL DESCRIPTIONS
GRAPH	LETTER	
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact



Measured groundwater level in exploration, well, or piezometer



Water level observed at time of exploration

Graphic Log Contact



Distinct contact between soil strata



Approximate contact between soil strata

Material Description Contact



Contact between geologic units



Contact between soil of the same geologic unit

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear


Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

Key to Exploration Logs

Start Drilled 6/16/2017	End 6/16/2017	Total Depth (ft) 20	Logged By ARS/MAG Checked By JMP	Driller Ocean Surveys, Inc.	Drilling Method Vibratory Coring
Surface Elevation (ft) Vertical Datum	-31 NAVD88	Hammer Data	N/A	Drilling Equipment	Barge-Mounted Pneumatic Vibratory Corer
Latitude Longitude	29.054303 -90.27218	System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	31.0

Notes: Location coordinates by Ocean Surveys, Inc. Elevation estimated by taking water at elev. 0.0 and subtracting water depth to mudline.

Elevation (feet)	Depth (feet)	FIELD DATA						MATERIAL DESCRIPTION	LABORATORY DATA									
		Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level		Graphic Log	Group Classification	Water Content, %	Dry Density, (pcf)	Shear Strength, (ksf)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %
-35 -40 -45 -50	0	23.5				1		CH	Gray clay with occasional silt pockets	69								
	24					2		Gray clay with silt lenses and silty sand lenses	63									
	10					3		Gray clay with silt lenses	63									
	24					4		Gray clay with silt pockets, silt lenses, and silty sand lenses	54									
	24					5		Gray clay with occasional silt lenses	68									
	12					6		Gray clay with 2-inch silty clay layer	57									
	24					7		Gray clay with 2-inch silty clay layer and occasional silt lenses	59									
	24					8		Gray clay with 3-inch silty clay layer, 1.5-inch silt layer, and silt lenses	55									
	12					9		Gray clay with silt lenses	51									
	24					10		Gray clay with silt lenses	65									
	24					11		Gray clay with silt lenses	58									
	12					12		Gray clay with silty clay pockets	50									

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Locational Survey, Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring WF17-01




Project: West Fourchon Marsh Creation
Project Location: Gulf of Mexico
Project Number: 16715-045-00

Figure B-2
Sheet 1 of 1

Start Drilled 6/16/2017	End 6/16/2017	Total Depth (ft) 20	Logged By ARS/CAH Checked By JMP	Driller Ocean Surveys, Inc.	Drilling Method Vibratory Coring
Surface Elevation (ft) Vertical Datum	-33 NAVD88	Hammer Data	N/A	Drilling Equipment	Barge-Mounted Pneumatic Vibratory Corer
Latitude Longitude	29.051881 -90.267139	System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	33.0

Notes: Location coordinates by Ocean Surveys, Inc. Elevation estimated by taking water at elev. 0.0 and subtracting water depth to mudline.

Elevation (feet)	FIELD DATA							MATERIAL DESCRIPTION	LABORATORY DATA										
	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level		Graphic Log	Group Classification	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
0		24				1			CH	Gray clay with silt lenses and 1-inch silt layer	69								
35		24				2			Gray clay with silt lenses and sand seams	57									
		7				3			Gray clay with silty sand lens	64									
5		24				4			Gray clay with silty sand lenses	57									
40		24				5			Gray clay with silt lenses and silt pockets	54									
		13				6			Gray clay with 2-inch clayey silt layer	67									
10		24				7			Gray clay with silt lenses	60									
45		24				8			Gray clay with 5-inch silty clay layer	40									
		12				9			Gray clay with silt lenses	49									
15		24				10			Gray clay with silt pockets and sand lenses	52									
50		24				11			Gray clay with silty clay lenses	50									
		13				12			Gray clay with silt	64									
20																			

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Locational Survey, Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring WF17-02



Project: West Fourchon Marsh Creation
Project Location: Gulf of Mexico
Project Number: 16715-045-00

Figure B-3
Sheet 1 of 1

Start Drilled 6/27/2017	End 6/27/2017	Total Depth (ft) 20	Logged By ARS/MAG Checked By JMP	Driller Ocean Surveys, Inc.	Drilling Method Vibratory Coring
Surface Elevation (ft) Vertical Datum	-34 NAVD88	Hammer Data	N/A	Drilling Equipment	Barge-Mounted Pneumatic Vibratory Corer
Latitude Longitude	29.050332 -90.270742	System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	34.0

Notes: Location coordinates by Ocean Surveys, Inc. Elevation estimated by taking water at elev. 0.0 and subtracting water depth to mudline.

Elevation (feet)	Depth (feet)	FIELD DATA					Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA								
		Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name			Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
35	0	8				1	CH	Gray clay with silt lenses	70								
	24					2		Gray clay with 1.5-inch dark gray silty clay layer, 1.5-inch silt layer, and silt lenses	63								
	24					3		Gray clay with silt layers and silt lenses	67								
40	5	24				4		Gray clay with sandy silt layers and sandy silt lenses	64								
	24					5		Gray clay with silt lenses and sandy silt pockets	54								
	12					6		Gray clay with sandy silt layers	55								
45	10	24				7		Gray clay with 1-inch clayey silt layer	62								
	24					8		Gray clay with clayey silt layers	57								
	12					9		Gray clay with 0.5-inch silt layer	60								
50	15	24				10		Gray clay with 1-inch to 3-inch silt layers	59								
	24					11		Gray clay with silt layers and silt lenses	60								
	13					12		Gray clay with silt lenses	59								
20																	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Locational Survey, Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring WF17-03




Project: West Fourchon Marsh Creation
Project Location: Gulf of Mexico
Project Number: 16715-045-00

Figure B-4
Sheet 1 of 1

Start Drilled 6/27/2017	End 6/27/2017	Total Depth (ft) 18.5	Logged By ARS/MAG Checked By JMP	Driller Ocean Surveys, Inc.	Drilling Method Vibratory Coring
Surface Elevation (ft) Vertical Datum		-35 NAVD88	Hammer Data N/A		Drilling Equipment Barge-Mounted Pneumatic Vibratory Corer
Latitude Longitude		29.047003 -90.267867	System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 35.0

Notes: Location coordinates by Ocean Surveys, Inc. Elevation estimated by taking water at elev. 0.0 and subtracting water depth to mudline.

Elevation (feet)	Depth (feet)	FIELD DATA					Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA								
		Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name				Water Level	Water Content, %	Dry Density, (pcf)	Shear Strength, (ksf)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %
40	0	24				1		CH	Gray clay with silt lenses and pockets of oily material at top (no chemical odor)	71								
		19				2			Gray clay with silt lenses	72								
		24				3			Gray clay with 1-inch clay with silt layer and silt lenses	68								
	5	24				4			Gray clay with 2-inch silty clay layer and silt lenses	67								
		12				5			Gray clay with clayey silt layers and silt lenses	57								
		24				6			Gray clay with sandy silt layers and sandy silt pockets	57								
	10	24				7			Gray clay with silt lenses	59								
		13				8			Gray clay with silt lenses	60								
		24				9			Gray clay with clayey silt pockets and silt lenses	61								
	15	24				10			Gray clay with 3-inch sandy silt layer and 3-inch silt layer	58								
		12				11			Gray clay with silt lenses and silt pockets	62								

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Locational Survey, Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring WF17-04




Project: West Fourchon Marsh Creation
Project Location: Gulf of Mexico
Project Number: 16715-045-00

Figure B-5
Sheet 1 of 1

Start Drilled 6/27/2017	End 6/27/2017	Total Depth (ft) 16	Logged By ARS/MAG Checked By JMP	Driller Ocean Surveys, Inc.	Drilling Method Vibratory Coring
Surface Elevation (ft) Vertical Datum		-36 NAVD88	Hammer Data N/A		Drilling Equipment Barge-Mounted Pneumatic Vibratory Corer
Latitude Longitude		29.042939 -90.26658	System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 36.0

Notes: Location coordinates by Ocean Surveys, Inc. Elevation estimated by taking water at elev. 0.0 and subtracting water depth to mudline.

Elevation (feet)	Depth (feet)	FIELD DATA					Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA								
		Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name				Water Level	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %
40	0	24				1		CH	Gray clay with silt lenses, silt layers, pockets of oily material (no chemical odor), top 3-inch dark gray silty sand with clay and shells	65								
		24				2			Gray clay with sandy silt lenses and sandy silt layers	63								
		23				3			Gray clay with silt lenses	70								
5		24				4			Gray clay with silt lenses and silt pockets	66								
		24				5			Gray clay with silty clay layers and silt lenses	54								
		12				6			Gray clay with sandy silt layers and sandy silt lenses	62								
45		24				7			Gray clay with silt lenses	61								
		24				8			Gray clay with sandy silt layers and silt lenses	62								
		13				9			Gray clay with clayey silt layers	57								
50																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Locational Survey, Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring WF17-05



Project: West Fourchon Marsh Creation
Project Location: Gulf of Mexico
Project Number: 16715-045-00

Figure B-6
Sheet 1 of 1

Start Drilled 6/27/2017	End 6/27/2017	Total Depth (ft) 20	Logged By ARS/MAG Checked By JMP	Driller Ocean Surveys, Inc.	Drilling Method Vibratory Coring
Surface Elevation (ft) Vertical Datum		-37 NAVD88	Hammer Data N/A		Drilling Equipment Barge-Mounted Pneumatic Vibratory Corer
Latitude Longitude		29.041134 -90.264831	System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 37.0

Notes: Location coordinates by Ocean Surveys, Inc. Elevation estimated by taking water at elev. 0.0 and subtracting water depth to mudline.

Elevation (feet)	Depth (feet)	FIELD DATA					Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA								
		Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name				Water Level	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %
0 40 45 50 55 20	0	24				1		CH	Gray clay with silt lenses, silt layers, and occasional pockets of oily material (no chemical odor)	64								
		24				2			Gray clay with silt lenses	69								
	5	10				3			Gray clay with silt lenses	70								
		24				4			Gray clay with silt lenses	72								
	45	24				5			Gray clay with silty clay layers	64								
		12				6			Gray clay with silty sand lenses and silty sand pockets	63								
	10	24				7			Gray clay with silt lenses and occasional sandy silt pockets	64								
		24				8			Gray clay with silt lenses	68								
	15	12				9			Gray clay with silt lenses	60								
		24				10			Gray clay with silt layers and silt lenses	56								
	55	24				11			Gray clay with silty clay layers	56								
		12				12			Gray clay with silt lenses	61								

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Locational Survey, Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring WF17-06



Project: West Fourchon Marsh Creation
Project Location: Gulf of Mexico
Project Number: 16715-045-00

Figure B-7
Sheet 1 of 1

Date: 3/13/19 Path: P:\16715-045\GINT\1671504500.GPJ DBLibrary\Library\GEOENGINEERS_DF STD_US_JUNE_2017\GLB\GEB8_GEO TECH_LAB_MUDLINE

Drilled	Start 7/1/2017	End 7/1/2017	Total Depth (ft)	20	Logged By ARS/MAG	Checked By JMP	Driller Ocean Surveys, Inc.	Drilling Method	Vibratory Coring		
Surface Elevation (ft) Vertical Datum			-33 NAVD88		Hammer Data		N/A		Drilling Equipment	Barge-Mounted Pneumatic Vibratory Corer	
Latitude Longitude			29.046534 -90.290144		System Datum		Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft)		33.0

Notes: Location coordinates by Ocean Surveys, Inc. Elevation estimated by taking water at elev. 0.0 and subtracting water depth to mudline.

Elevation (feet)	Depth (feet)	FIELD DATA					MATERIAL DESCRIPTION	LABORATORY DATA								
		Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name		Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
0		24				1	Gray clay with silt lenses, silt pockets, and pocket of oily material (no chemical odor)	71								
35		24				2	Gray clay with silt lenses and silt pockets	72								
		6				3	Gray clay with silt pockets	55								
5		24				4	Gray clay with silt lenses	68								
40		24				5	Gray clay with 1-inch silt layer and silt lenses	69								
		12				6	Gray clay with 2-inch silt layer and silt lenses	59								
10		24				7	Gray clay with silt layers and silt pockets	62								
45		24				8	Gray clay with silt layers, silt lenses, and occasional sand pockets	57								
		12				9	Gray clay with 3-inch silt with clay layer	56								
15		24				10	Gray clay with silt layers	65								
50		24				11	Gray clay with 1-inch silt layers and silt lenses	59								
20		12				12	Gray clay with 1-inch silt layer	65								

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Locational Survey, Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring WF17-07



Project: West Fourchon Marsh Creation
Project Location: Gulf of Mexico
Project Number: 16715-045-00

Figure B-8
Sheet 1 of 1

Date: 3/13/19 Path: P:\16715-045\GINT\16715045\GINT\1671504500.GPJ DBLibrary\Library\GEOENGINEERS_DF STD_US_JUNE_2017\GLB\GEB8_GEO TECH_LAB_MUDLINE

Drilled	Start 7/1/2017	End 7/1/2017	Total Depth (ft)	20	Logged By DNR/MAG	Checked By JMP	Driller Ocean Surveys, Inc.	Drilling Method	Vibratory Coring		
Surface Elevation (ft) Vertical Datum			-31 NAVD88		Hammer Data		N/A		Drilling Equipment	Barge-Mounted Pneumatic Vibratory Corer	
Latitude Longitude			29.044608 -90.294567		System Datum		Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft)		31.0

Notes: Location coordinates by Ocean Surveys, Inc. Elevation estimated by taking water at elev. 0.0 and subtracting water depth to mudline.

Elevation (feet)	Depth (feet)	FIELD DATA						MATERIAL DESCRIPTION	LABORATORY DATA								
		Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level		Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
0		24				1		CH	57								
		24				2		Gray clay with silt pockets and silt lenses	64								
35		12				3		Gray clay with silt pockets	55								
5		24				4		Gray clay with silt pockets and silt lenses	62								
		24				5		Gray clay with silt pockets and silt lenses	66								
40		12				6		Gray clay with silt lenses	66								
10		24				7		Gray clay with silt lenses	63								
		24				8		Gray clay	68								
45		12				9		Gray clay with silt lenses	48								
15		24				10		Gray clay with silt lenses	64								
		24				11		Gray clay with silt lenses	66								
50		12				12		Gray clay with silt lens and 2-inch silty clay layer	59								
20																	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Locational Survey, Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring WF17-08



Project: West Fourchon Marsh Creation
Project Location: Gulf of Mexico
Project Number: 16715-045-00

Figure B-9
Sheet 1 of 1

Drilled	Start 7/2/2017	End 7/2/2017	Total Depth (ft)	19	Logged By Checked By	CAH/MAG JMP	Driller	Ocean Surveys, Inc.	Drilling Method	Vibratory Coring		
Surface Elevation (ft) Vertical Datum			-34 NAVD88		Hammer Data			N/A			Drilling Equipment	Barge-Mounted Pneumatic Vibratory Corer
Latitude Longitude		29.042762 -90.28823			System Datum		Geographic NAD83 (feet)			Depth of water to mudline at time of exploration (ft)		34.0
Notes: Location coordinates by Ocean Surveys, Inc. Elevation estimated by taking water at elev. 0.0 and subtracting water depth to mudline.												

Elevation (feet)	Depth (feet)	FIELD DATA					Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA								
		Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name			Water Level	Graphic Log	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %
33	0	24			1			CH	Gray clay with pockets of black oily material (no chemical odor)	77							
		24			2			Gray clay with silt lenses	64								
		24			3			Gray clay with silt lenses and organic material pockets	72								
30	5	24			4			Gray clay with silt lenses	63								
		12			5			Gray clay with silt lenses	55								
		24			6			Gray clay with silt lenses	55								
25	10	24			7			Gray clay with silt lenses and silt pockets	65								
		12			8			Gray clay with silt lenses	60								
		24			9			Gray clay with silt lenses	67								
20	15	24			10			Gray clay with silt lenses	69								
		12			11			Gray clay with silt pockets	63								

Note: See Figure A-1 for explanation of symbols.

Coordinates Data Source: Horizontal approximated based on Locational Survey, Vertical approximated based on Topographic Survey

*Indicates a remold was used for strength testing.

Log of Boring WF17-09



Project: West Fourchon Marsh Creation


Project Location: Gulf of Mexico

Project Number: 16715-045-00

Figure B-10
Sheet 1 of 1

Drilled	Start 7/2/2017	End 7/2/2017	Total Depth (ft)	20	Logged By ARS/MAG	Checked By JMP	Driller Ocean Surveys, Inc.	Drilling Method	Vibratory Coring
Surface Elevation (ft) Vertical Datum	-34 NAVD88			Hammer Data	N/A			Drilling Equipment	Barge-Mounted Pneumatic Vibratory Corer
Latitude Longitude	29.041345 -90.291531			System Datum	Geographic NAD83 (feet)			Depth of water to mudline at time of exploration (ft)	34.0

Notes: Location coordinates by Ocean Surveys, Inc. Elevation estimated by taking water at elev. 0.0 and subtracting water depth to mudline.

Elevation (feet)	Depth (feet)	FIELD DATA						MATERIAL DESCRIPTION	LABORATORY DATA									
		Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level		Graphic Log	Group Classification	Water Content, %	Dry Density, (pcf)	Shear Strength, (ksf)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %
35	0	24				1			CH	Gray clay with organic pockets and silty sand lenses	63							
		24				2			Gray clay with silt lenses and 2-inch silty sand layer	62								
		7				3			Gray clay with silt lenses	66								
40	5	24				4			Gray clay with silt lenses	69								
		24				5			Gray clay with silt lenses and silt pockets	66								
		12				6			Gray clay with silt lenses and silt pockets	64								
45	10	24				7			Gray clay with clayey silt layers and clayey silt lenses	58								
		24				8			Gray clay with 1-inch silty sand layer and silt lenses	62								
		12				9			Gray clay with silt lenses	59								
50	15	24				10			Gray clay with silt lenses	62								
		24				11			Gray clay with 3-inch silty clay layer and silt lenses	62								
		12				12			Gray clay	63								
55	20																	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Locational Survey, Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring WF17-10



Project: West Fourchon Marsh Creation
Project Location: Gulf of Mexico
Project Number: 16715-045-00

Figure B-11
Sheet 1 of 1

Drilled	Start 7/2/2017	End 7/2/2017	Total Depth (ft)	20	Logged By ARS/MAG	Checked By JMP	Driller Ocean Surveys, Inc.	Drilling Method	Vibratory Coring
Surface Elevation (ft) Vertical Datum	-36 NAVD88			Hammer Data	N/A			Drilling Equipment	Barge-Mounted Pneumatic Vibratory Corer
Latitude Longitude	29.034267 -90.287114			System Datum	Geographic NAD83 (feet)			Depth of water to mudline at time of exploration (ft)	36.0

Notes: Location coordinates by Ocean Surveys, Inc. Elevation estimated by taking water at elev. 0.0 and subtracting water depth to mudline.

Elevation (feet)	Depth (feet)	FIELD DATA						MATERIAL DESCRIPTION	LABORATORY DATA								
		Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level		Graphic Log	Group Classification	Water Content, %	Dry Density, (pcf)	Shear Strength, (ksf)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %
0 <																	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Locational Survey, Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring WF17-11



Project: West Fourchon Marsh Creation
Project Location: Gulf of Mexico
Project Number: 16715-045-00

Figure B-12
Sheet 1 of 1

Start Drilled 6/27/2017	End 6/27/2017	Total Depth (ft) 20	Logged By CAH/MAG Checked By JMP	Driller Ocean Surveys, Inc.	Drilling Method Vibratory Coring
Surface Elevation (ft) Vertical Datum	-37 NAVD88	Hammer Data	N/A	Drilling Equipment	Barge-Mounted Pneumatic Vibratory Corer
Latitude Longitude	29.03666 -90.281093	System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	37.0

Notes: Location coordinates by Ocean Surveys, Inc. Elevation estimated by taking water at elev. 0.0 and subtracting water depth to mudline.

Elevation (feet)	Depth (feet)	FIELD DATA						MATERIAL DESCRIPTION	LABORATORY DATA									
		Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level		Graphic Log	Group Classification	Water Content, %	Dry Density, (pcf)	Shear Strength, (ksf)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %
0		24				1		CH	Gray clay with silt lenses and pockets of black oily material (no chemical odor)	74								
40		24				2			Gray clay with 4-inch silt layer	47								
		13				3			Gray clay	61								
5		24				4			Gray clay	70								
		24				5			Gray clay	71								
45		12				6			Gray clay with silt lenses	61								
	10	24				7			Gray clay with silty sand lenses and silty sand pockets	57								
		24				8			Gray clay with silt lenses	63								
50		12				9			Gray clay with silt lenses	63								
	15	24				10			Gray clay with silt lenses and 2-inch silt layer	63								
		24				11			Gray clay with silty clay lenses and 2-inch silt layer	53								
55		12				12			Gray clay with silty clay lenses and 2-inch silty clay layer	55								
	20																	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Locational Survey, Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring WF17-12



Project: West Fourchon Marsh Creation
Project Location: Gulf of Mexico
Project Number: 16715-045-00

Figure B-13
Sheet 1 of 1

Soil Boring ID	Depth Interval (ft)	D2488	Test Type	D2216	D2166/D2850		D4318			D422/D1140 /D6913	D2166/D2850					D4648	Comments
		Visual Description		Moisture (%)	Unit Weight (PCF)		Atterberg Limits			%<#200 Sieve	Shear Strength (KSF)	Remolded Strength (KSF)	Failure Strain (%)	Confining Pressure (PSI)	Failure Type	Mini Vane Shear Strength (KSF)	
					Wet	Dry	LL	PL	PI								
WF17-01 Composite	0.0 - 20.0	Gray clay (CH)	AL HYD SG SV	59.0			73	23	50	99.5							SG = 2.743
WF17-02 Composite	0.0 - 20.0	Gray clay (CH)	AL HYD SG SV	56.2			67	21	46	99.7							SG = 2.722
WF17-03 Composite	0.0 - 20.0	Gray clay (CH)	AL HYD SG SV MC	58.7			70	23	47	99.1							SG = 2.731
WF17-04 Composite	0.0 - 18.5	Gray clay (CH)	AL HYD SG SV MC	61.9			81	22	59	99.1							SG = 2.748
WF17-05 Composite	0.0 - 16.0	Gray clay (CH)	AL HYD SG SV	62.3			78	23	55	99.5							SG = 2.717
WF17-06 Composite	0.0 - 20.0	Gray clay (CH)	AL HYD SG SV	60.4			87	21	66	99.7							SG = 2.816
WF17-07 Composite	0.0 - 20.0	Gray clay (CH)	AL HYD SG	60.3			83	24	59	99.3							SG = 2.780
WF17-08 Composite	0.0 - 20.0	Gray clay (CH)	AL HYD SG SV	60.3			81	20	61	99.5							SG = 2.750
WF17-09 Composite	0.0 - 19.0	Gray clay (CH)	AL HYD SG SV	62.7			86	24	62	99.1							SG = 2.745
WF17-10 Composite	0.0 - 20.0	Gray clay (CH)	AL HYD SG SV	59.4			83	23	60	99.5							SG = 2.756
WF17-11 Composite	0.0 - 20.0	Gray clay (CH)	AL HYD SG SV	61.2			78	20	58	99.0							SG = 2.795
WF17-12 Composite	0.0 - 20.0	Gray clay (CH)	AL HYD SG SV	61.6			89	25	64	99.5							SG = 2.755
WF17-13 Composite	0.0 - 20.0	Gray clay (CH)	AL HYD SG SV	64.6			88	21	67	99.5							SG = 2.715

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slicksided = SLS Bulge = B Crumble = C



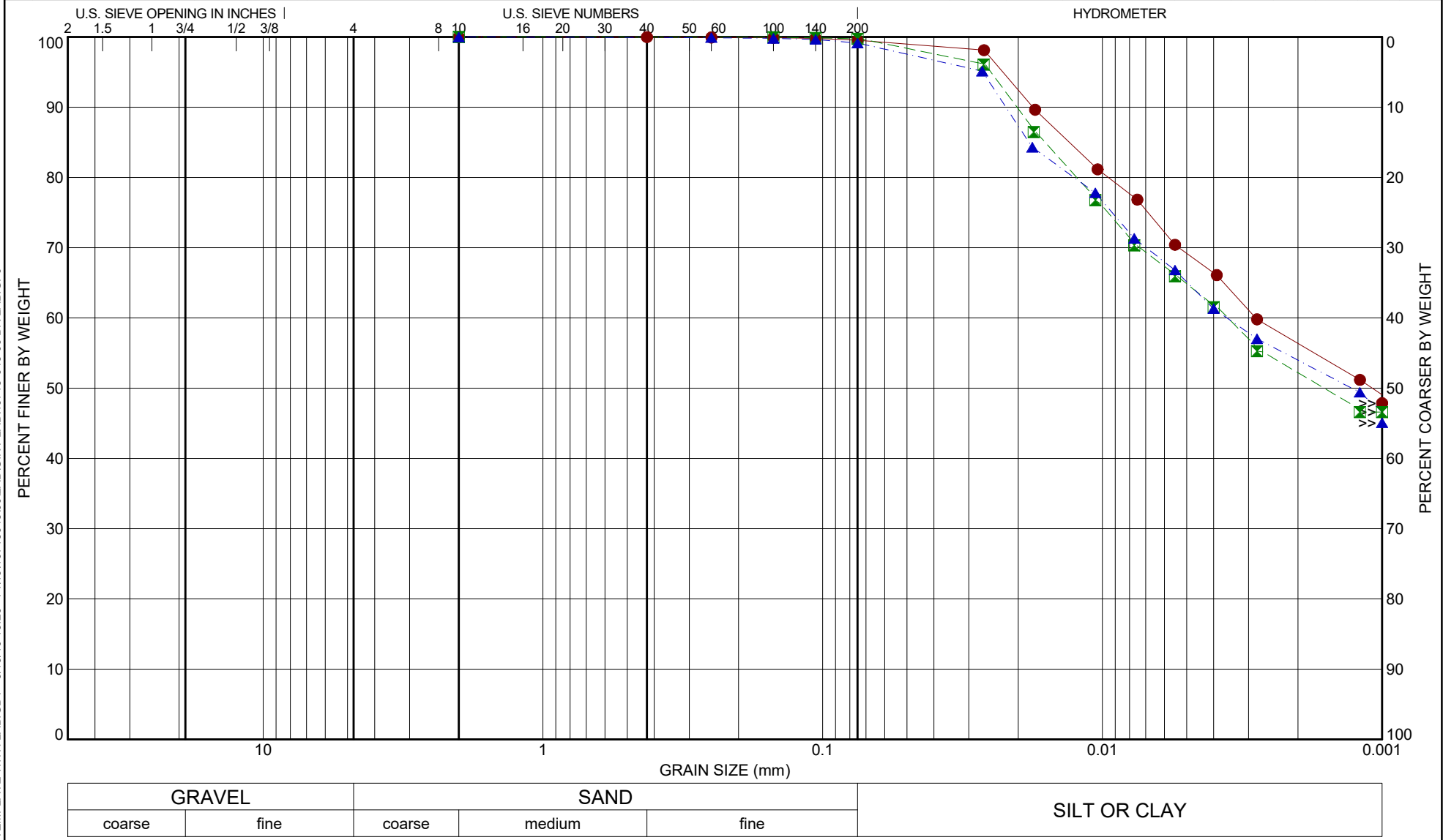
 AASHTO ACCREDITED	Technical Responsibility: <u>Karen Allen</u> Title: <u>QAM</u> Date: <u>3/13/19</u>	Summary of Lab Results Project No.: 16715-045-00	West Fouchon Marsh Creation Gulf of Mexico
			GEOENGINEERS 

Figure B-15

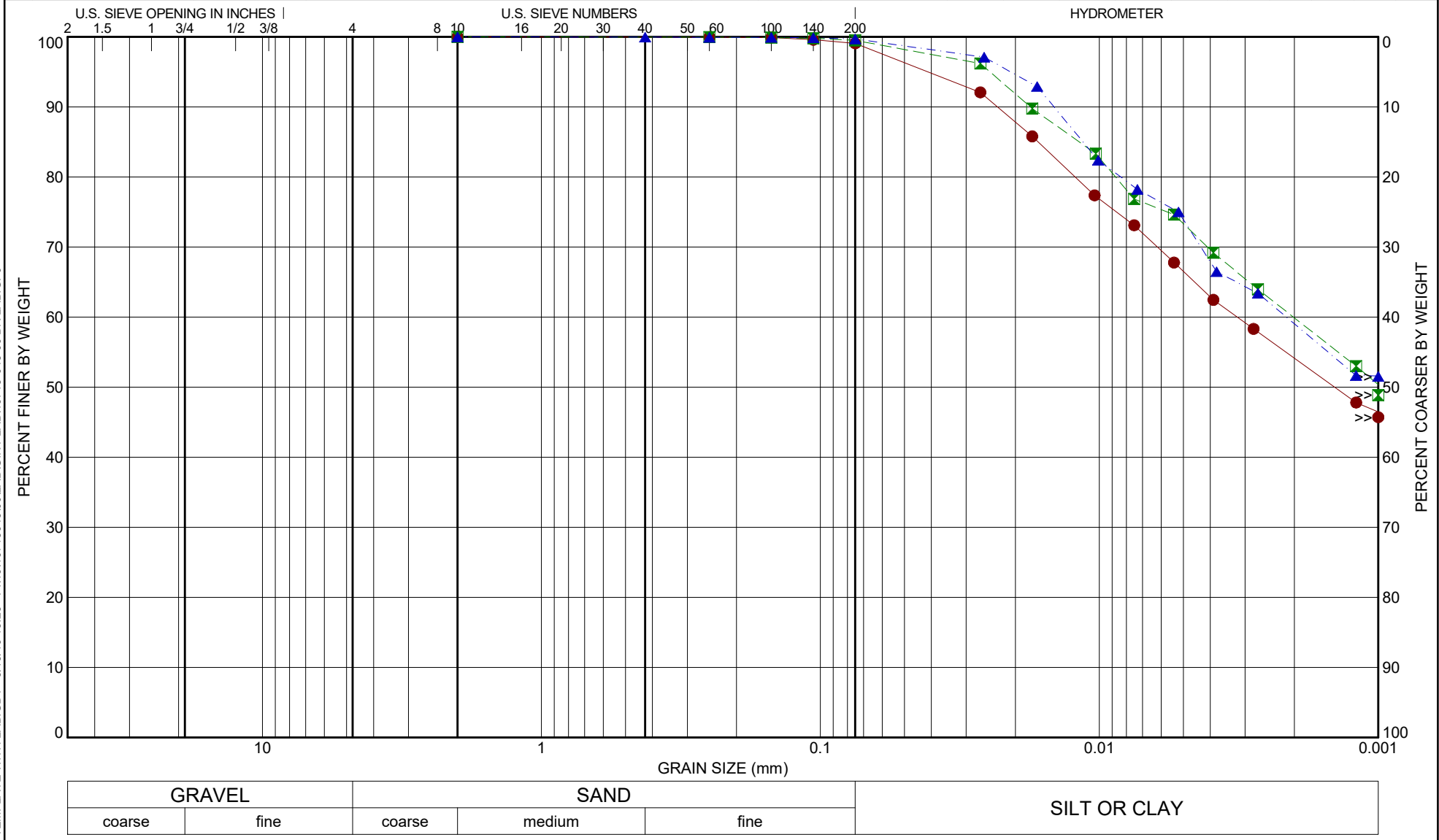
Soil Boring ID	Depth (ft)	Classification	%Gravel	%Sand	%Silt	%Clay	D90	D60	D50	D30	D10	Cc	Cu	LL	PL	PI
WF17-01 Composite	0.0 - 20.0	Gray clay (CH)	0.0	0.5	30.3	69.2	0.018	0.003	0.001					73	23	50
WF17-02 Composite	0.0 - 20.0	Gray clay (CH)	0.0	0.3	35.1	64.6	0.02	0.004	0.002					67	21	46
WF17-03 Composite	0.0 - 20.0	Gray clay (CH)	0.0	0.9	33.9	65.2	0.022	0.004	0.001					70	23	47




Tested By: CLP	Date Tested: 7/24/2017	GRAIN SIZE DISTRIBUTION ASTM D422/D1140/D6913/T88 Project No.: 16715-045-00 <small>Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.</small>	West Fourchon Marsh Creation Gulf of Mexico
Reviewed By: Karen Allen	Date Reviewed: 7/24/2017		

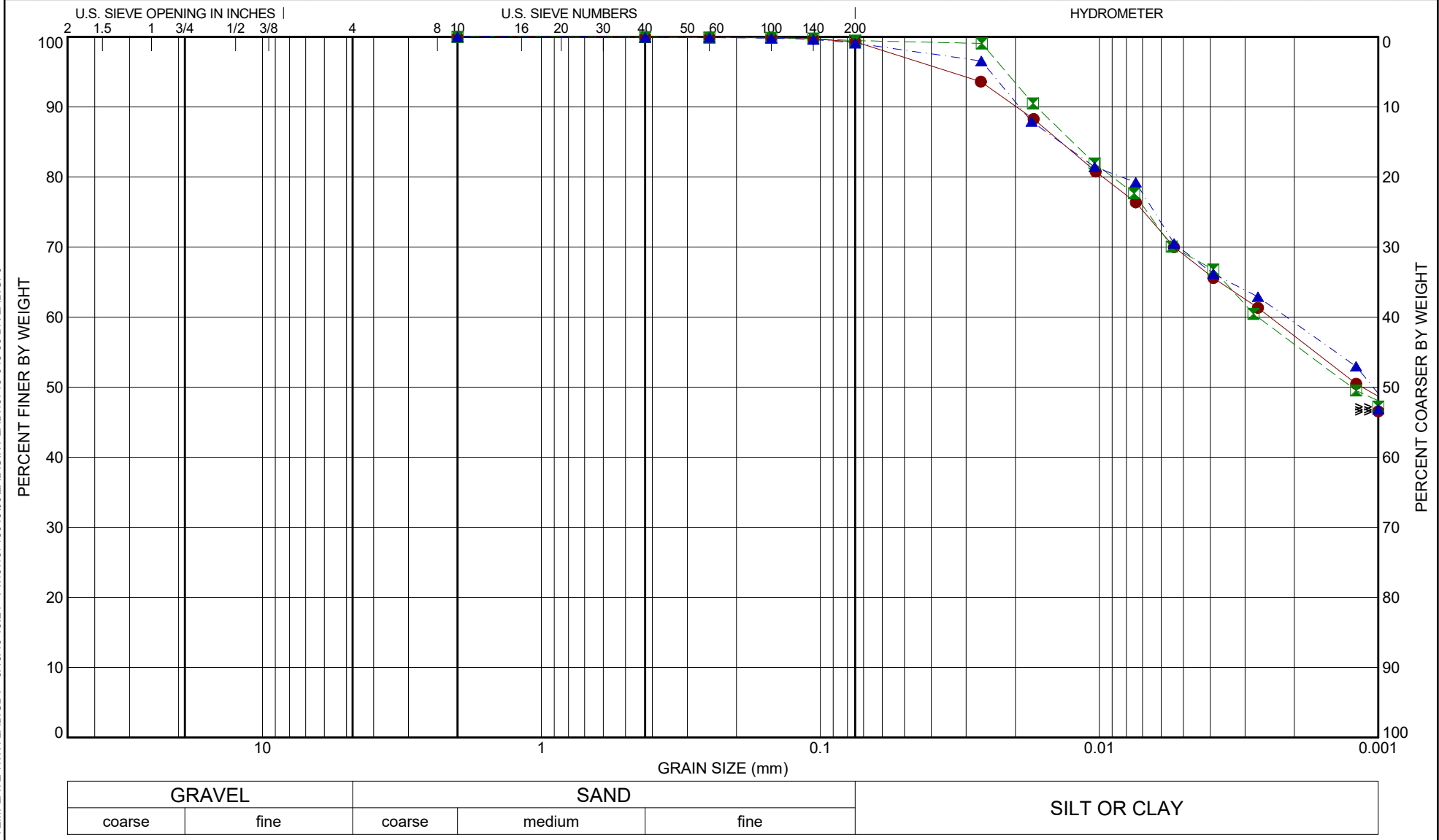
Figure B-16

Soil Boring ID	Depth (ft)	Classification	%Gravel	%Sand	%Silt	%Clay	D90	D60	D50	D30	D10	Cc	Cu	LL	PL	PI
WF17-04 Composite	0.0 - 18.5	Gray clay (CH)	0.0	0.9	32.6	66.5	0.023	0.003	0.001					81	22	59
WF17-05 Composite	0.0 - 16.0	Gray clay (CH)	0.0	0.5	26.2	73.3	0.018	0.002	0.001					78	23	55
WF17-06 Composite	0.0 - 20.0	Gray clay (CH)	0.0	0.3	25.7	73.9	0.015	0.002						87	21	66



Tested By: SLC	Date Tested: 7/22/2017	GRAIN SIZE DISTRIBUTION ASTM D422/D1140/D6913/T88 Project No.: 16715-045-00 <small>Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.</small>	West Fourchon Marsh Creation Gulf of Mexico
Reviewed By: Karen Allen	Date Reviewed: 7/24/2017		 Figure B-17

Soil Boring ID	Depth (ft)	Classification	%Gravel	%Sand	%Silt	%Clay	D90	D60	D50	D30	D10	Cc	Cu	LL	PL	PI
WF17-07 Composite	0.0 - 20.0	Gray clay (CH)	0.0	0.7	30.4	68.9	0.02	0.002	0.001					83	24	59
WF17-08 Composite	0.0 - 20.0	Gray clay (CH)	0.0	0.5	30.3	69.2	0.017	0.003	0.001					81	20	61
WF17-09 Composite	0.0 - 19.0	Gray clay (CH)	0.0	0.9	29.6	69.5	0.019	0.002	0.001					86	24	62




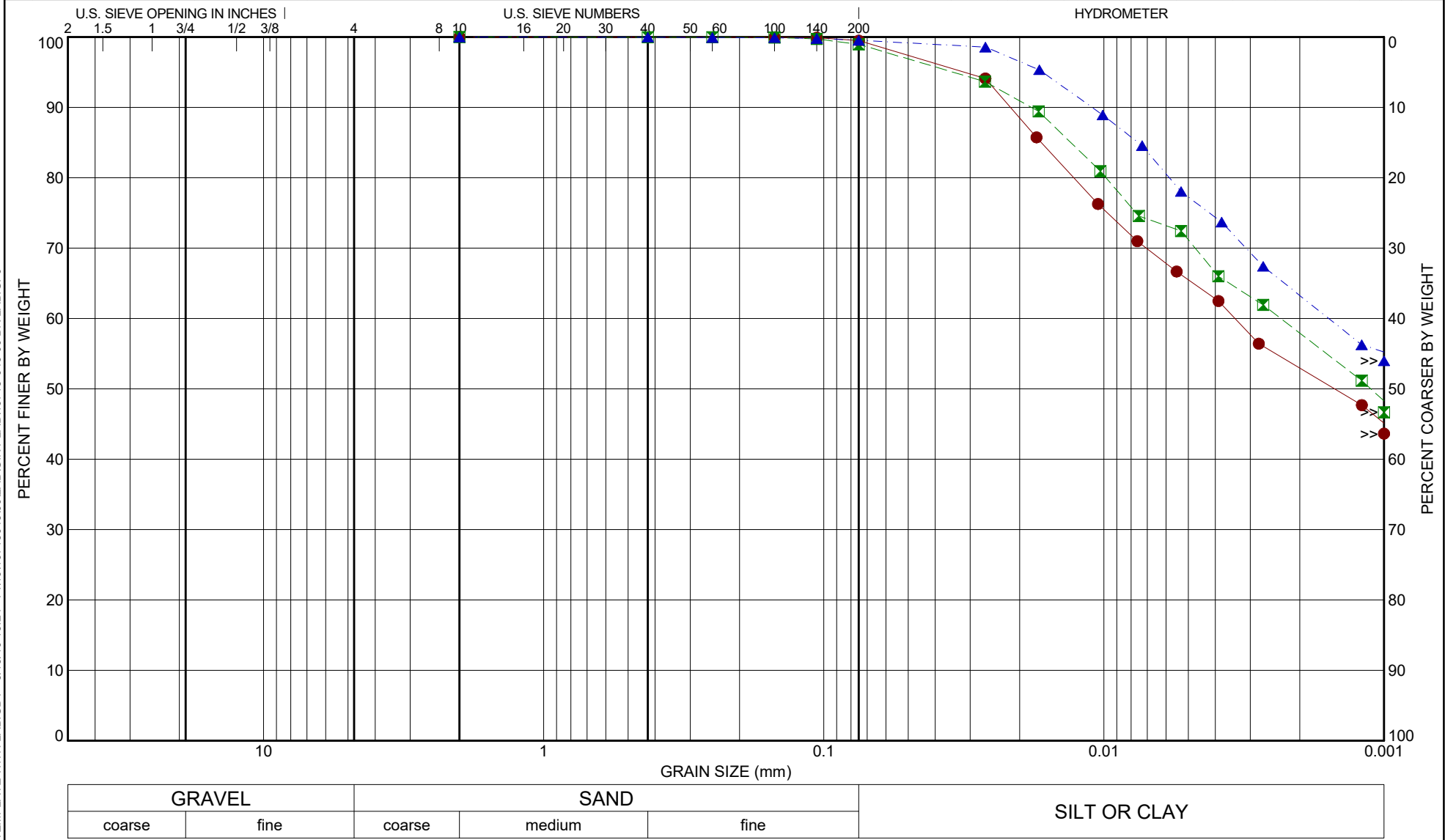

Tested By: CLP	Date Tested: 7/25/2017	GRAIN SIZE DISTRIBUTION ASTM D422/D1140/D6913/T88 Project No.: 16715-045-00 <small>Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.</small>	West Fourchon Marsh Creation	
Reviewed By: Karen Allen	Date Reviewed: 7/25/2017		Gulf of Mexico	
				Figure B-18

Figure B-18

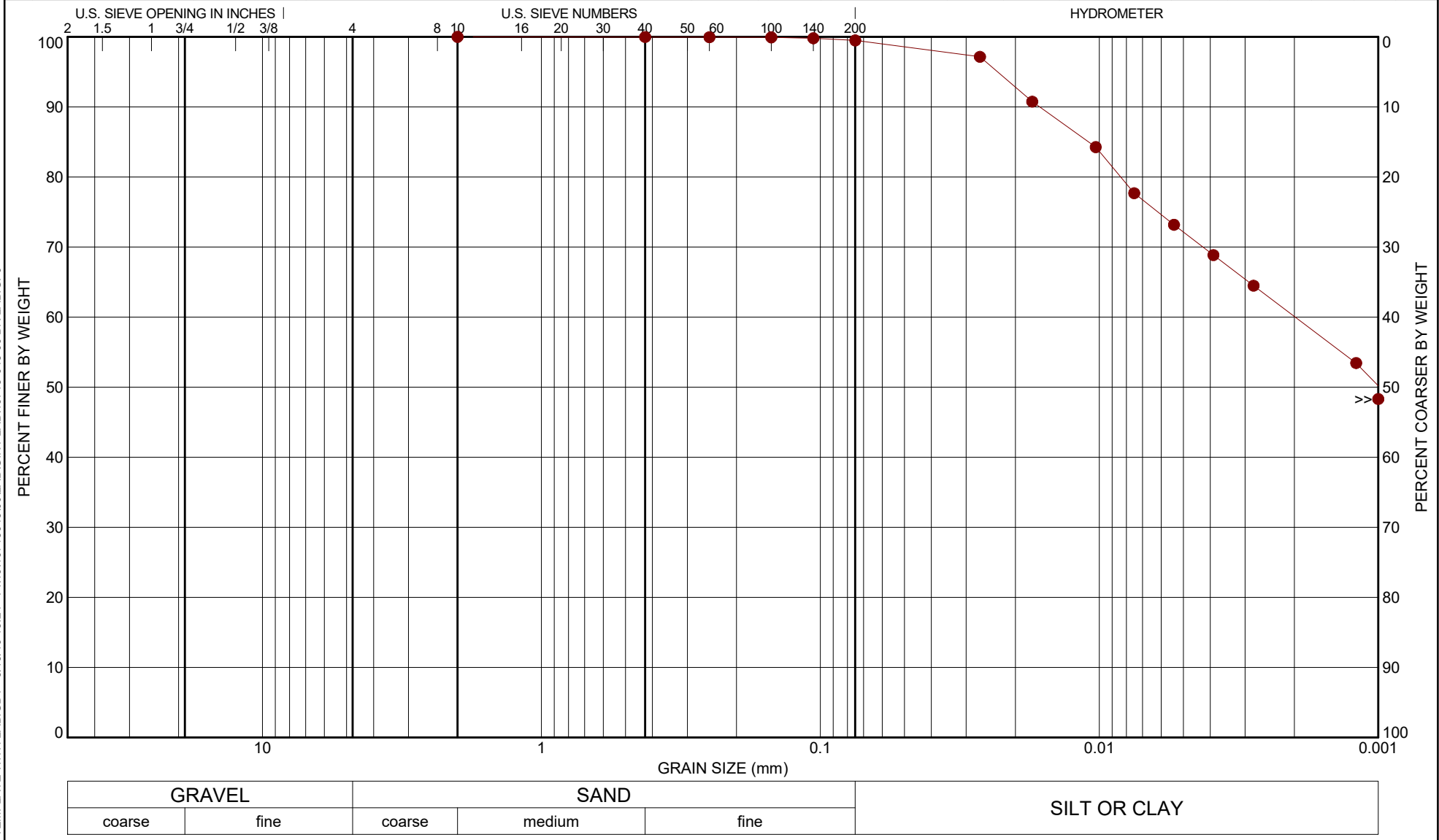
Soil Boring ID	Depth (ft)	Classification	%Gravel	%Sand	%Silt	%Clay	D90	D60	D50	D30	D10	Cc	Cu	LL	PL	PI
WF17-10 Composite	0.0 - 20.0	Gray clay (CH)	0.0	0.5	34.0	65.5	0.022	0.003	0.002					83	23	60
WF17-11 Composite	0.0 - 20.0	Gray clay (CH)	0.0	1.0	27.8	71.2	0.018	0.002	0.001					78	20	58
WF17-12 Composite	0.0 - 20.0	Gray clay (CH)	0.0	0.5	22.3	77.3	0.011	0.002						89	25	64




Tested By: SLC	Date Tested: 7/22/2017	GRAIN SIZE DISTRIBUTION ASTM D422/D1140/D6913/T88 Project No.: 16715-045-00 <small>Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.</small>	West Fourchon Marsh Creation	
	Date Reviewed: 7/24/2017		Gulf of Mexico	
Reviewed By: Karen Allen			Figure B-19	

GEI - GRAIN SIZE - GEO TEMPLATE WITH LAB.GDT - 3/13/19 13:24 - P:\16\16715045\00\LAB\GINT LAB\16715-045-00 BR LAB.GPJ

Soil Boring ID	Depth (ft)	Classification	%Gravel	%Sand	%Silt	%Clay	D90	D60	D50	D30	D10	Cc	Cu	LL	PL	PI
WF17-13 Composite	0.0 - 20.0	Gray clay (CH)	0.0	0.5	27.3	72.2	0.016	0.002	0.001					88	21	67



Tested By: CLP	Date Tested: 7/25/2017	GRAIN SIZE DISTRIBUTION ASTM D422/D1140/D6913/T88 Project No.: 16715-045-00 <small>Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.</small>	West Fourchon Marsh Creation Gulf of Mexico
Reviewed By: Karen Allen	Date Reviewed: 7/25/2017		 Figure B-20

GEI - GRAIN SIZE - GEO TEMPLATE WITH LAB.GDT - 3/13/19 13:24 - P:\16\16715045\00\LAB\GINT LAB\16715-045-00 BR LAB.GPJ

