

LOG OF BORING AA-31

SHEET 1 of 1



Rock Engineering & Testing Lab., Inc.
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CLIENT: HDR Engineering, Inc.
PROJECT: Galveston Anchorage Area C Sand Source Inv.
LOCATION: Anchorage Area C, Galveston, Texas
NUMBER: G109233

DATE(S) DRILLED: 10/15/09 - 10/15/09

DRILLING METHOD(S):

Hollow Stem Auger

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -25.72' NAVD

DESCRIPTION OF STRATUM

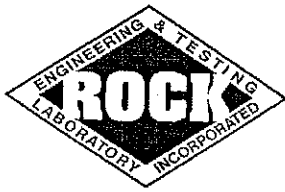
FIELD DATA		LABORATORY DATA								DRILLING METHOD(S): Hollow Stem Auger		
SOIL SYMBOL	Elevation, Ft. [NAVD]	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: TONS/SQ FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSION STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)	GROUNDWATER INFORMATION:
						LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				
						LL	PL	PI				
DESCRIPTION OF STRATUM												
	5											
	10											
	15											
	20											
	25											
SS S-1		X	N= 0								6	<u>POORLY GRADED SAND</u> , with clay and shell fragments, gray and brown, very loose.
SS S-2		X	N= 0									Same as above.
SS S-3		X	N= 5								18	<u>SILTY CLAYEY SAND</u> , with shell fragments, gray and brown, loose.
SS S-4		X	N= 14									Same as above, medium.
SS S-5		X	N= 3								19	Same as above, very loose.
SS S-6		X	N= 9									<u>POORLY GRADED SAND</u> , with clay and shell fragments, dark gray and brown, loose.
SS S-7		X	N= 9								8	Same as above, gray.
												Boring was extended to an elevation of -39.7-feet NAVD during the drilling operations.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - POCKET TORVANE SHEAR STRENGTH

REMARKS:

Boring depth and location was determined by HDR Engineering, Inc. Boring operations were performed by RETL at GPS Coord. N. 29.34833 W. 94.76854.

LOG_OF_BORIN_9233 ANCHORAGE BASIN C.GPJ ROCK ETL.GDT 11/30/09



- Geotechnical Engineering
- Construction Materials Testing

PROJECT NAME: Galveston Anchorage Area C Sand Source Investigation

CLIENT: HDR Engineering, Inc.

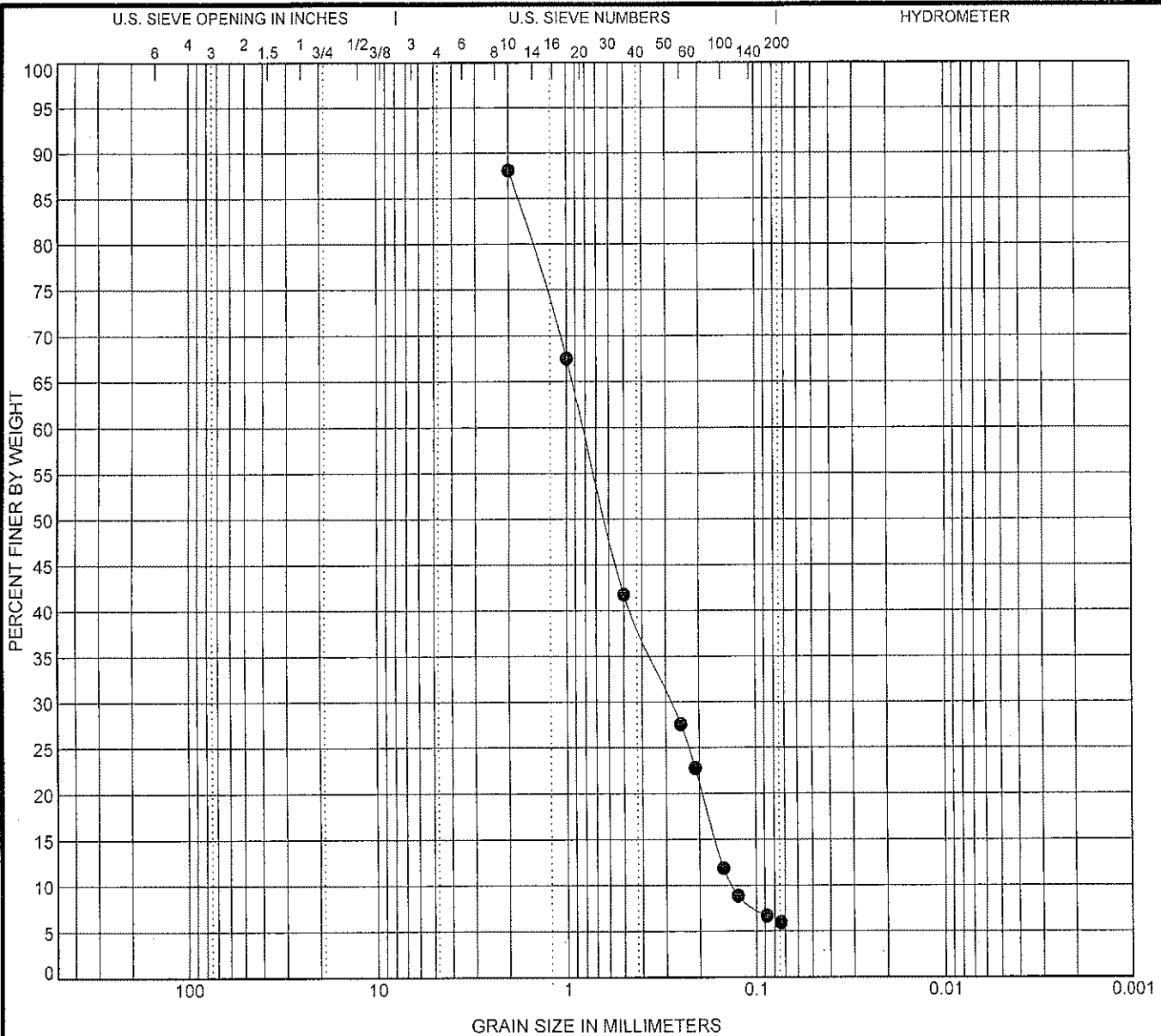
BORING ID.: AA-31

DESCRIPTION: Anchorage Area C Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-25.72' to -27.72' NAVD	-29.72' to -31.72' NAVD	-33.72' to -35.72' NAVD	-37.72' to -39.72' NAVD
11.90	0.80	13.50	5.78

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-25.72' to -27.72' NAVD	-29.72' to -31.72' NAVD	-33.72' to -35.72' NAVD	-37.72' to -39.72' NAVD
#10	100.00	100.00	100.00	100.00
#18	67.50	98.40	73.50	87.00
#35	41.80	97.60	58.20	80.60
#60	27.60	96.50	44.30	75.10
#70	22.80	95.60	40.20	69.90
#100	11.90	50.00	27.90	27.00
#120	8.90	30.00	22.50	13.90
#170	6.70	21.90	18.60	8.50
#200	6.00	18.30	17.60	7.70
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	0.65	0.15	0.31	0.16
MEAN GRAIN SIZE (mm)	0.57	N/A	N/A	0.13
SORTING (σ)	N/A	N/A	N/A	N/A

*The -#10 material was utilized as the total sample for Grain Size Distribution Curve calculations.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification				LL	PL	PI	Cc	Cu
● AA-31	(-25.72' to -27.72' NAVD)	AA-31 (-25.72' to -27.72' NAVD)							0.73	6.13
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
● AA-31	(-25.72' to -27.72' NAVD)	2	0.817	0.281	0.133	0.0				



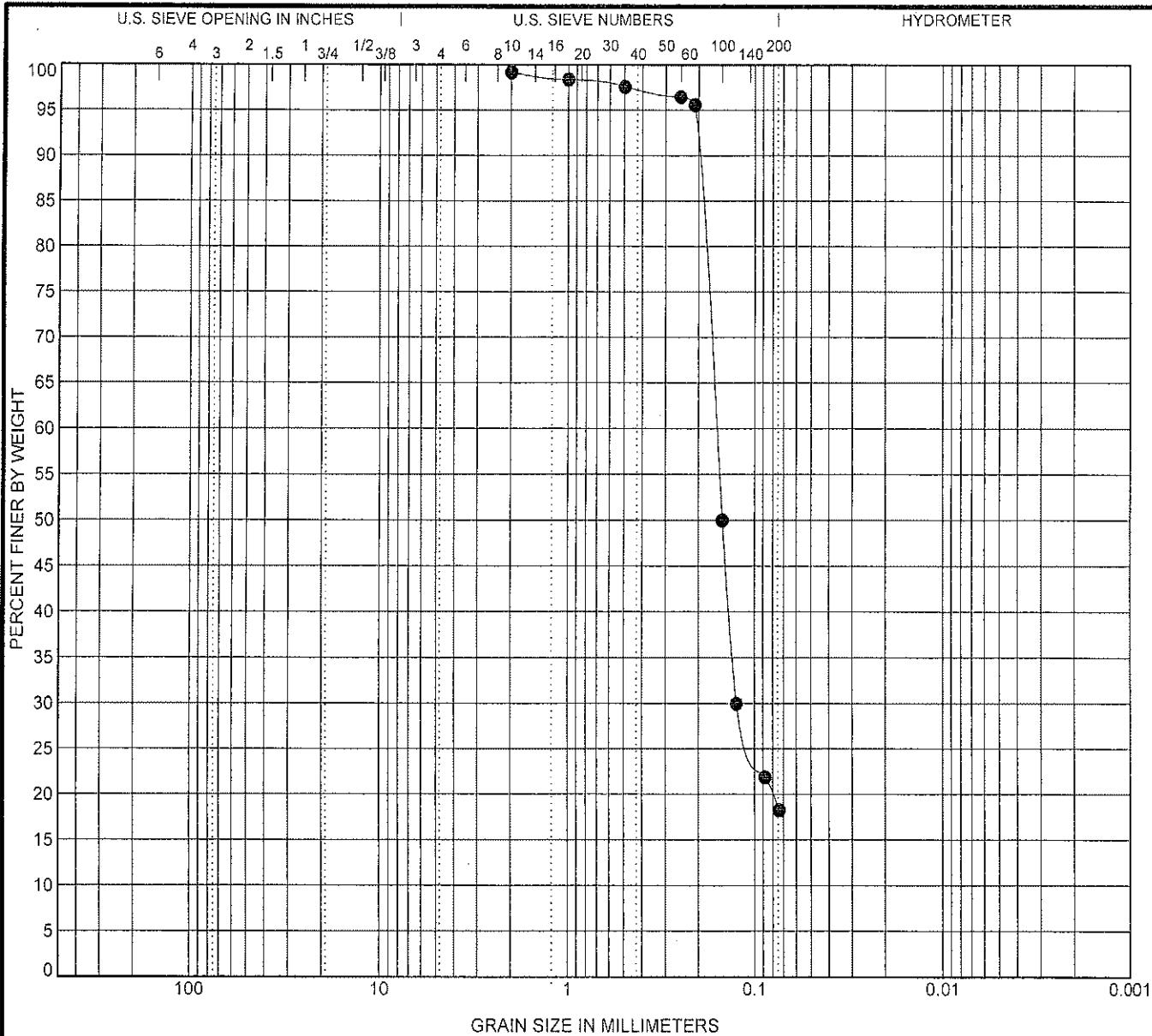
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GRAIN SIZE DISTRIBUTION

Project: Galveston Anchorage Area C Sand Source Inv.

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification					LL	PL	PI	Cc	Cu
● AA-31	(-29.72' to -31.72' NAVD)	AA-31 (-29.72' to -31.72' NAVD)									
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● AA-31	(-29.72' to -31.72' NAVD)	2	0.161	0.125		0.0					

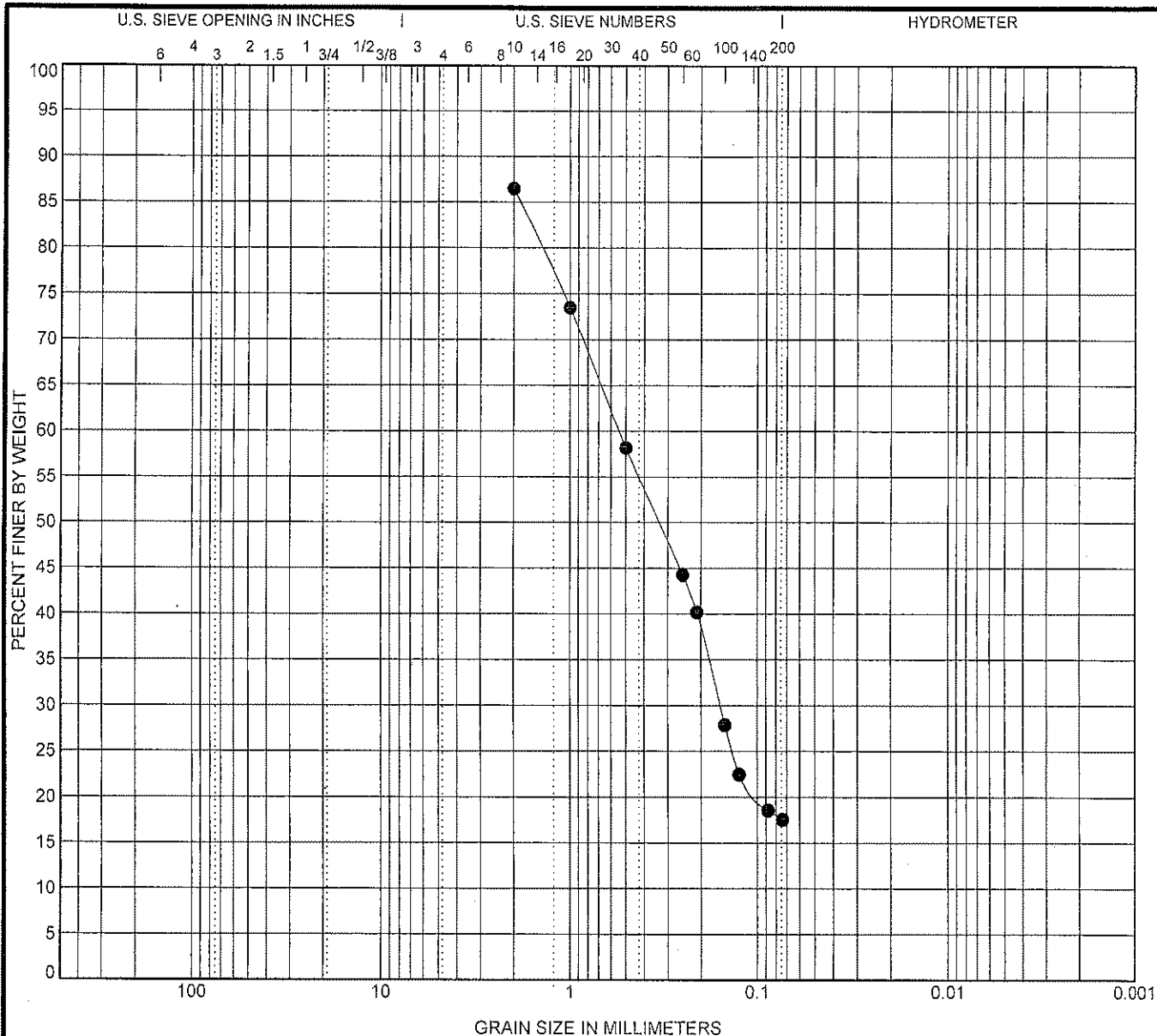


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U.S. GRAIN SIZE G109233 ANCHORAGE BASIN C.GPJ U.S. LAB.GDT 12/1/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

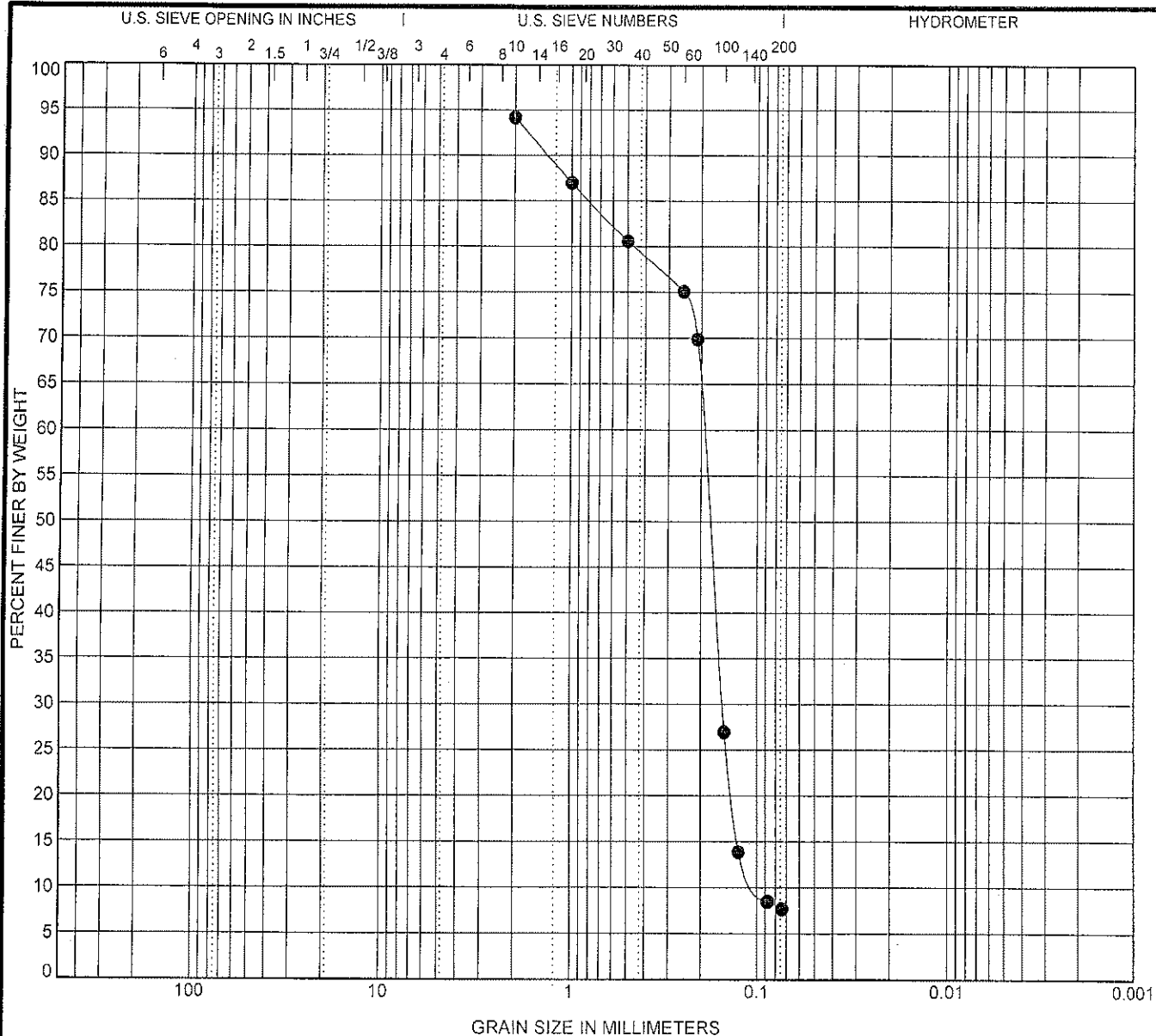
Specimen ID		Depth	Classification				LL	PL	PI	Cc	Cu
●	AA-31	(-33.72' to -35.72' NAVD)	AA-31 (-33.72' to -35.72' NAVD)								
Specimen ID		Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
●	AA-31	(-33.72' to -35.72' NAVD)	2	0.542	0.158		0.0				



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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-31 (-37.72' to -39.72' NAVD)		AA-31 (-37.72' to -39.72' NAVD)				1.24	2.00

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-31 (-37.72' to -39.72' NAVD)		2	0.194	0.153	0.097	0.0			



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Figure 1: AA-31; Sample 1



Figure 2: AA-31; Sample 2

December 8, 2009
Attn.: Ms. Lauren Augustin
RETL Job No.: G109233

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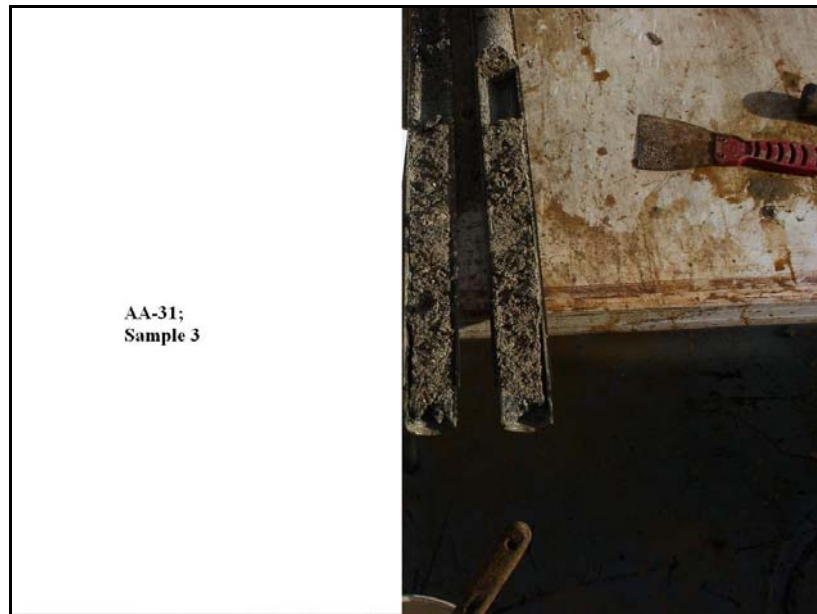


Figure 3: AA-31; Sample 3

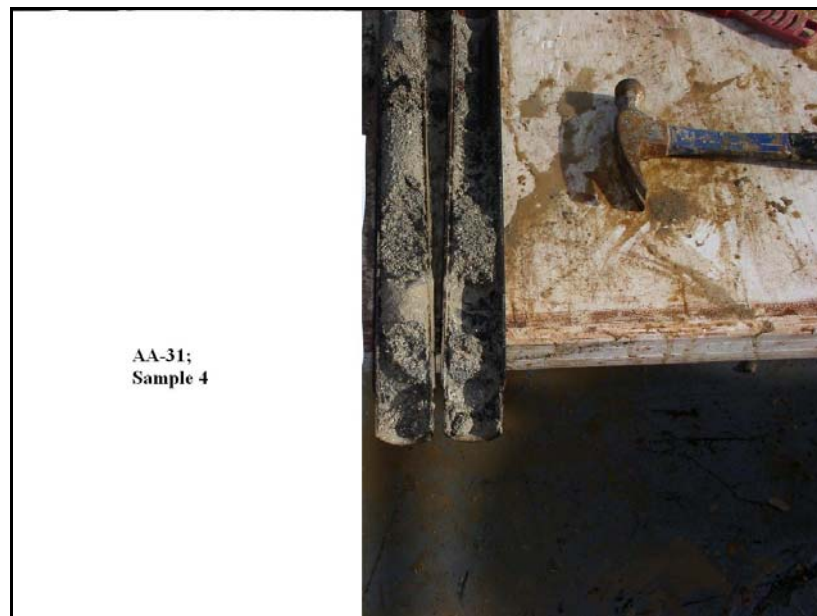


Figure 4: AA-31; Sample 4

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Figure 5: AA-31; Sample 5

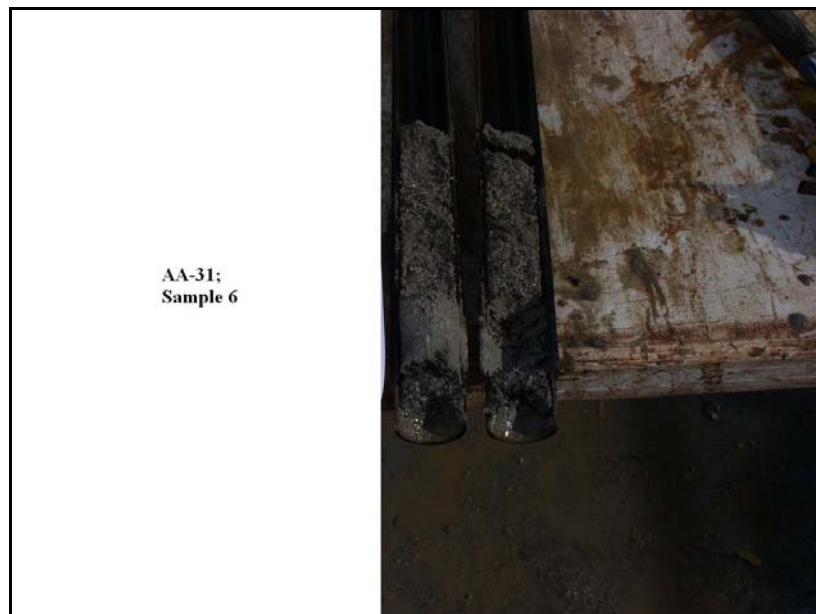


Figure 6: AA-31; Sample 6

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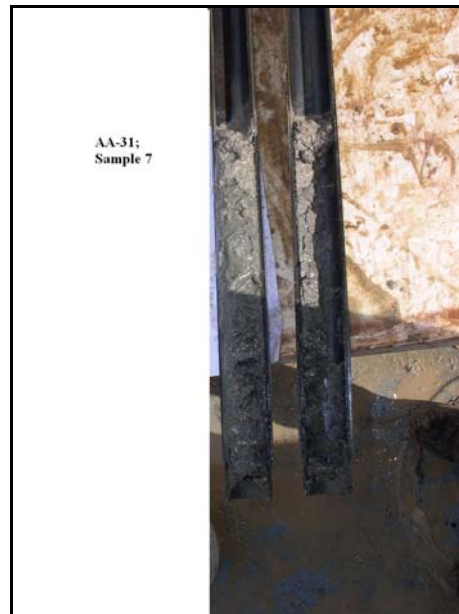


Figure 7: AA-31; Sample 7

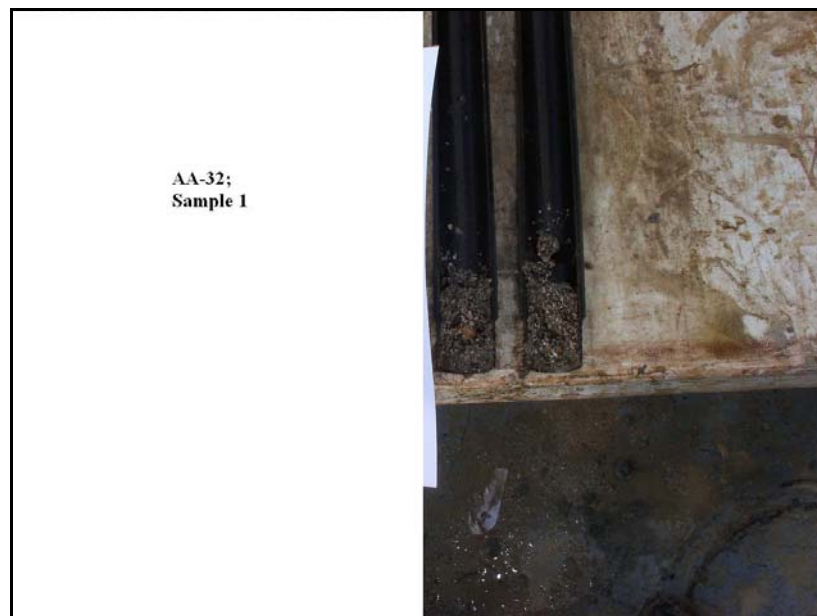


Figure 8: AA-32; Sample 1

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