



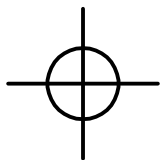
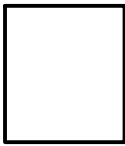
184 HIGH STREET
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REVISIONS

#	DATE	DESCRIPTION
1	9/27/10	BORING PROG. & NUM.

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-  APPROXIMATE LOCATION OF BORINGS TO BE COMPLETED
-  BORINGS COMPLETED

- NOTES:
- THE PROPOSED BORING LOCATIONS SHOWN HEREON ARE APPROXIMATE. ACTUAL LOCATIONS OF BORINGS WILL VARY DURING THE SITE INVESTIGATION BASED ON; THE SELECTED DESIGN OPTION, CONDITIONS ENCOUNTERED IN THE FIELD, THE SUB-SURFACE CONDITIONS REVEALED DURING THE EXECUTION OF THE BORING PROGRAM, AND THE RESULTS AND REQUIREMENTS OF THE ARCHAEOLOGICAL INVESTIGATION.
 - THIS IS A INTERIM PROGRESS PLAN FOR PLANNING PURPOSES ONLY. ACTUAL BORING LOCATIONS AND NUMBER MAY VARY.

DRAFT

PREPARED FOR:

THE NEW BEDFORD
HARBOR DEVELOPMENT
COMMISSION
NEW BEDFORD,
MASSACHUSETTS

DRAWING TITLE:

SOUTH TERMINAL
MARINE
INFRASTRUCTURE PARK
SUB-SURFACE
INVESTIGATION
PROGRESS PLAN
9/27/2010

Scale: 1"=100'

0 50 100 200 300 FEET

Date 2/11/10	Drawing No. P-1
Proj. Mgr.	
Design CWM	
Check JAB	
Drawn GCD	
Job. No. 6615	
Last Rev. 9/27/10	

NEW BEDFORD



BORING LOG

Date: 9/14/2010
Time: 8:00 AM

Project:	Phase IV Dredging	Project No: 6690.005	X: 816198.2
Location:	South Terminal Expansion		Y: 2688154.5
Elevation at mudline:	-23.15'	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-38.5' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Todd Pentacost	Log By:	GCD
			Boring No: A-2010-B1
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%					
2		24" 6"	11,2,11,13	Dark Grey, fine to coarse SAND, some Silt, some fine to coarse Gravel.	-25.15
4		24" 5"	19,33,39,18	Grey SILT and fine to coarse SAND, some fine to coarse Gravel - TILL	-27.15
4.75		9" 4"	15, 100/3"	Grey SILT some fine to coarse Sand, some fine to coarse Gravel. Refusal at -27.9 MLLW.	-27.9
5.35				Cleaned hole for coring run, roller bit to top of bedrock (-28.5 MLLW)	-28.5
11	50%	5' 4.6'	7,6,6,10,14	Bedrock Core #1: -28.5 to - 33.5 MLLW - Intensely to moderately fractured grey Granitic Gneiss	-33.5
16	97%	5' 4.85	6,6,6,9,11	Bedrock Core #2: -33.5 to -38.5 MLLW - Moderately fractured grey Granitic Gneiss	-38.5

Comments: Core run was completed at less revolutions per minute than recommended by core barrel manufacturer, so drill time is not a good indicator of rock competency.

Refusal: -27.9' MLLW

Elevation of Bedrock: -28.5' MLLW



BORING LOG

Date: 9/15/2010
Time: 11:30 AM

Project:	Phase IV Dredging	Project No: 6690.005	X: 816277.4
Location:	South Terminal Expansion		Y: 2688458.0
Elevation at mudline:	-6.3'	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-39.4' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Todd Pentacost	Log By:	GCD
			Boring No: A-2010-B2
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 15"	1,1,1,1	Black to dark grey, Organic SILT, some fine Sand, little shell hash, becomes grey in nose of spoon	-8.3
4		24" 15"	2,5,10,14	Dark Grey fine SAND, some organic Silt grades to fine SAND some Inorganic Silt, trace fine to coarse Gravel	-10.3
6		24" 21"	12,14,14,19	-10.3 to -10.8 MLLW Grey fine SAND some Fine to Coarse Gravel, trace coarse -10.8 to -12.0 MLLW Grey fine SAND grading to Inorganic SILT and fine SAND -12.0 to -12.3 MLLW Grey Coarse SAND and fine to coarse GRAVEL	-12.3
8		24" 15"	9,17,16,20	Grey, medium to coarse SAND, little fine to coarse Gravel	-14.3
10		24" 14"	5,15,15,12	Grey, medium to coarse SAND, little fine to coarse Gravel, grades to fine to medium SAND	-16.3
12		24" 21"	3,4,10,12	10 - 11 Grey, fine SAND, trace Silt, grades to fine to medium SAND. 11-12 Grey, fine to coarse SAND, trace fine Gravel, grading to coarse SAND	-18.3
14		24" 21"	6,7,9,12	Grey, fine to medium SAND, little fine to coarse Gravel	-20.3
16		24" 12.5"	14,16,24,24	Grey fine to coarse SAND, some Silt, some fine to coarse Gravel, mottle at 15.0 to 15.4 red/orange tan.	-22.3
18		24" 11"	8,10,3,3	Grey and Tan mottled, fine to coarse SAND, some Silt, some fine to coarse Gravel, grades to fine to medium SAND and SILT in nose of spoon	-24.3
19.75		21" 16"	23,32,34, 100/3"	Grey and tan mottled, fine to coarse SAND, and SILT, some fine to coarse Gravel. Refusal at -26.2' MLLW.	-26.05
23.6				Drilled with button tooth roller bit through cobbles, drove casing to refusal and began core run at -29.9 MLLW	-29.9
28.1	48%	60" 47"	6,8,8,10, 5min/6"	Bedrock Core #1: -29.9 to -34.4 MLLW - Moderately to intensely fractured grey Granitic Gneiss, core barrel jammed at 4.5 feet into core run.	-34.4
33.1	50%	60" 44"	7,8,10,10, 10	Bedrock Core #2: -34.4 to -39.4 MLLW - Moderately to intensely fractured grey Granitic Gneiss	-39.4

Comments: Core run was completed at less revolutions per minute than recommended by core barrel manufacturer, drill time is not a good indicator of rock competency.
Refusal: -26.2' MLLW
Elevation of Bedrock: -29.9' MLLW



BORING LOG

Date: 9/16/2010
Time: 11:20 AM

Project:	Phase IV Dredging	Project No: 6690.005	X: 816365.6
Location:	South Terminal Expansion		Y: 2688161.5
Elevation at mudline:	-1.1'	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-35.7' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Todd Pentacost	Log By:	GCD
			Boring No: A-2010-B3
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 18"	7,5,5,4	Dark Grey, very fine to fine SAND, little organic Silt, trace shell hash, one juvenile clam.	-3.1
7		24" 5"	10,13,20,17	Grey, fine to coarse SAND, trace Silt, sharp color change to Tan, fine to medium SAND, little Silt. Gravel caught in nose of spoon	-8.1
12		24" 6"	16,19,20,23	4" of Grey, fine to coarse GRAVEL and fine to medium SAND, trace Silt. 2" of Grey tan, SILT, some fine to coarse SAND, some fine to coarse Gravel. TILL	-13.1
17		24" 4"	17,18,14,14	Grey, SILT and fine SAND, some fine to coarse Gravel, little medium to coarse Sand, Gravel stuck in top of sample.	-18.1
22		24" 5"	80,60,40,61	Tan, fine SAND, some Silt, some fine to coarse Gravel, trace medium to coarse Sand, Gravel stuck in top of sample.	-23.1
24.6				Refusal while advancing casing to next interval. Cleaned hole with button toothed roller bit, flushed hole and began coring at -25.7' MLLW	-25.7
29.6	25%	5' 3.3'	5,6,19 (Jams)	Bedrock Core #1: -25.7 to -30.7 MLLW - Very intensely fractured grey Granitic GNEISS, with pegmatic intrusions (pink and grey).	-30.7
34.6	37%	5' 4.6'	(Frequent Jams)	Bedrock Core #2: -30.7 to -35.7 MLLW - Intensely fractured grey Granitic GNEISS with pegmatic (pink and grey) intrusions.	-35.7

Comments: Core run was completed at less revolutions per minute than recommended by core barrel manufacturer, drill time is not a good indicator of rock competency, drill times were not recorded after the first 3 feet of penetration, due to frequent starts and stops of coring process as barrel jammed and was cleared.

Refusal: -25.7 MLLW

Elevation of

Bedrock: -25.7 MLLW



BORING LOG

Date: 9/20/2010
Time: 8:05 AM

Project:	Phase IV Dredging	Project No: 6690.005	X: 816439.9
Location	South Terminal Expansion		Y: 2687856.3
Elevation at mudline:	-2.5'	Datum:	MLLW
Casing Type: Steel		Boring Depth: -43.75' MLLW	Boring No: A-2010-B4
Casing Diameter: 4"		Drill Rig: CME 45	
Drill Co: NH Boring		Method: Drill and Wash	Sheet: 1 of 1
Driller: Todd Pentacost		Log By: GCD	

Depth below mudline (ft)	RQD	Penetration/Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 24"	WOH, WOH, WOH, WOH	Black, Organic SILT, little shell hash, little fine to medium Sand.	-4.5
4		N/A N/A	N/A	No split spoon this interval.	-6.5
6		24" 3.5"	1,1,1,1	Dark Grey to Black, fine to medium SAND and SILT, little shell hash.	-8.5
8		24" 13"	13,6,8,9	Grey, fine to medium SAND, some Silt, little fine to coarse Gravel	-10.5
10		24" 12"	9,17,20,20	Grey, fine GRAVEL, some coarse Sand, little coarse Gravel. Coarse gravel stuck in nose of spoon.	-12.5
12		24" 11"	10,8,10,12	Grey, fine SAND, some Silt, some fine to coarse Gravel, trace medium to coarse Sand.	-14.5
14		24" 8"	8,14,16,11	Grey, fine SAND, some fine to coarse Gravel, trace Silt.	-16.5
16		24" 9"	49,9,8,13	Grey, SILT some fine Sand little fine to coarse Gravel, little medium to coarse Sand. Mottled interval approx 0.25 to 0.5' becomes Brown, then back to Grey.	-18.5
18		24" 10"	24,20,18,16	SILT, some fine to coarse Sand, some fine to coarse Gravel, Color changes 0.0-0.25' Grey, 0.25-0.55' light Grey, 0.55-0.80' Brown	-20.5
20		24" 10"	13,12,21,14	Tan SILT and GRAVEL, some fine to coarse Sand	-22.5
21.66		20" 10"	17,10,15, 100/2"	Tan, SILT, some fine to coarse Gravel, some fine to coarse Sand. 3" of Grey completely weathered Granitic Gneiss in nose of spoon. Refusal at -24.16 MLLW.	-24.16
22.7				Drilled with button tooth roller bit, cleaned hole, and began core run at -25.2 MLLW.	-25.2
26.7	0%	48" 20"	10,12,19, (Jam)	Rock Core #1: -25.2 to -29.2 MLLW - Shattered greenish Grey Granitic Gneiss (11" in pieces none longer than 3") Potassium Feldspar rich Pegmatic intrusion (9" in pieces none longer than 3"), core barrel jammed at 1.5, water return stopped intermittently through core run, drilling paused each time	-29.2
29.7	0%	36" 25"	6,6,14, (Jam)	Rock Core #2: -29.2 to -32.2 MLLW - Interface of Pegmatite and Granitic Gneiss (2"), highly fractured grey Granitic Gneiss (23") No unfractured pieces greater than 4"	-32.2
31.7	0%	24" 16"	(Frequent Jams)	Rock Core #3: -32.2 to -34.2 MLLW - Highly fractured grey Granitic Gneiss (16") No unfractured pieces greater than 4"	-34.2
36.7	0%	60" 36"	(Frequent Jams)	Rock Core #4: -34.2 to -39.2 MLLW - Highly fractured pink and greenish grey Granitic Gneiss (36") No unfractured pieces greater than 4", shattered between 18" and 25" includes quartz vein 19"-20"	-39.2
41.7	82%	60" 58"	(Frequent Jams)	Rock Core #5: -39.2 to -43.75 MLLW - Highly fractured pink and greenish grey Granitic Gneiss (21") Grades to grey Granitic Gneiss until sharp increase in potassium feldspar content at 56" changes hue back to pink and grey Granitic Gneiss.	-43.75

Comments: Core run was completed at less revolutions per minute than recommended by core barrel manufacturer, drill time is not a good indicator of rock competency. Drill times were not recorded on portions of Rock Cores 1 and 2 as well as Rock Cores 3, 4, and 5, due to frequent starts and stops of coring process as barrel jammed and was cleared.

Refusal: -24.16' MLLW

Elevation of
Bedrock: -25.2' MLLW



BORING LOG

Date: 3/7/2011
Time: 8:30 AM

Project:	Phase IV Dredging	Project No: 6690.008	X: 816478
Location:	South Terminal Expansion		Y: 2687708
Elevation at mudline:	-3.7	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-45.30' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GAD
			Boring No: A-2011-B5
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
3		36" 24"	WOR,WOR, WOR,WOR	Black, organic SILT, trace SHELL HASH	-6.7
5		24" 24"	WOR,WOR, WOR,WOR	Black, organic SILT, trace SHELL HASH, trace GRAVEL	-8.7
7		24" 12"	3,1,5,10	Black, organic SILT, trace SHELL HASH, trace fine GRAVEL, grades to Greenish grey, fine to medium SAND, trace fine GRAVEL	-10.7
9		24" 18"	16,29,26,28	Greenish grey, fine to coarse SAND, some fine to coarse GRAVEL, trace SILT	-12.7
11		24" 6"	17,8,7,10	Greenish grey, fine SAND some fine to medium SAND, little fine GRAVEL	-14.7
13		24" 6"	37,31,20,30	Greenish grey, fine to medium SAND, some coarse SAND, some fine GRAVEL, trace SILT	-16.7
15		24" 12"	14,10,12,17	Greenish grey, fine to medium SAND, some coarse SAND, some fine GRAVEL, trace SILT	-18.7
17		24" 0	25,9,8,11	No Recovery	-20.7
19		24" 2"	20,18,21,17	Greenish grey, fine to medium SAND, some coarse SAND, some fine GRAVEL, trace SILT	-22.7
21		24" 10"	16,16,19,22	Olive grey, medium to coarse SAND, some fine SAND, some fine GRAVEL	-24.7
23		24" 12"	7,9,11,8	Olive grey, medium to coarse SAND, some fine SAND, some fine GRAVEL	-26.7
25		24" 12"	23,24,21,15	Olive grey, medium to coarse SAND, some fine SAND, some fine GRAVEL, transitions to olive grey, fine to medium SAND, trace SILT	-28.7
26.25		15" 7"	17,16, 100/3"	Olive grey, fine to medium SAND, some SILT, some GRAVEL. Refusal at -29.95.	-29.95
26.60				Drilled with mill tooth roller bit, cleaned hole, and began core run at -30.30.	-30.3
31.60	48%	5.0' 4.4'	6,6,7,6,6	Rock Core #1 -30.30' to -35.30' MLLW. 0.0-4.0' intensely to moderately fractured grey, GRANITE, 4.0 to 4.4' intensely fractured moderately weathered grey GRANITE	-35.3
36.60	49%	5.0' 4.35'	8-7-8-7-7	Rock Core #2 -35.30' to -40.30' MLLW. 0.0' - 0.6' moderate to heavily weathered, moderately fractured grey, granitic GNEISS, 0.6' - 3.4' fresh, moderately fractured, grey, granitic GNEISS, gneissic banding progressively decreases, 3.4'-4.4' grey GRANITE	-40.3
41.60	74%	5.0' 4.9'	7-8-8-7-7	Rock Core #3 -40.30' to -45.30' MLLW. 0.0-2.2' intensely to moderately fractured grey, granitic GNEISS. 2.2-3.6' gradual transition into and out of intensely to moderately fractured pink and grey granite PEGMATITE, 3.6-4.9' intensely to moderately fractured grey granitic GNEISS	-45.3

Comments: The descriptions of the rock in the cores above are descriptions of the sampled rock in each recovered core length.

Refusal: -29.95
Elevation of
Bedrock: -29.95



BORING LOG

Date: 9/23/2010
Time: 9:30 AM

Project:	Phase IV Dredging	Project No: 6690.005	X: 816518.5
Location:	South Terminal Expansion		Y: 2687561.6
Elevation at mudline:	-9.4	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-31.6' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Todd Pentacost	Log By:	GAD
			Boring No: A-2010-B6
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 6"	WOR,WOR, WOR,WOR	0-1' Black, organic SILT 1'-2' Olive Grey, medium to coarse SAND, some fine sand, trace Silt	-11.4
6		24" 12"	20,22,41,30	Greenish Grey, medium to coarse SAND, some fine Gravel	-15.4
10		24" 12"	12,16,22,15	Greenish Grey, medium to coarse SAND, some fine Gravel.	-19.4
12.2				Drove casing to refusal, cleaned hole, and began core run at -21.6 MLLW	-21.6
17.2	73%	60" 51"	7,7,6,5,7	Rock Core #1: -21.6 to -26.6 MLLW - Intensely to moderately fractured grey granitic Gneiss.	-26.6
22.2	27%	60' 50"	8,12,6,7,6	Rock Core #2: -26.6 to -31.6 MLLW - Intensely fractured grey Granitic Gneiss (0"-36"), intensely fractured pink and grey Granite Pegmatite (36" to 50").	-31.6

Comments: Core run was completed at less revolutions per minute than recommended by core barrel manufacturer, drill time is not a good indicator of rock competency.

Refusal: -21.6' MLLW

Elevation of
Bedrock: -21.6' MLLW



Date: 9/24/2010
Time: 12:15 PM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.005	X: 816781.1
Location:	South Terminal Expansion		Y: 2687710.6
Elevation at mudline:	-5.5	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-28.0' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Todd Pentacost	Log By:	GAD
			Boring No: A-2010-B7
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 12"	WOR,6,8,8	0-1' Black, organic SILT 1'-2' Olive Grey, fine to medium SAND, some shell hash, trace Silt	-7.5
4		24" 12"	9/11/12/16	Olive Grey, fine to medium SAND, some shell hash, trace Silt	-9.5
6		24" 12"	7/5/7/5	4'-4.5' Olive Grey, fine to medium SAND, some shell hash, trace Silt 4.5'-6' Greenish grey, fine SAND and SILT	-11.5
8		24" 24"	15/23/100-5"	6'-7.6' Olive Grey, fine to medium SAND, some shell hash, trace Silt 7.6'-8' Olive grey, fine SAND and SILT	-13.5
10		24" 24"	18/14/12/17	8'-8.5' Greenish grey, fine to medium SAND and fine angular GRAVEL 8.5'-9.5' Light grey, fine to medium SAND, some coarse SAND 9.5'-10' Greenish grey, fine SAND and SILT	-15.5
12		24" 24"	15/18/24/58	10'-11.5' Greenish grey, fine SAND and SILT, trace fine angular GRAVEL 11.5'-12' Olive grey, medium to coarse SAND, trace ROCK fragments at tip.	-17.5
12.5				Drove casing to refusal, cleaned hole, and began core run at -18.0 MLLW	-18
17.5	88%	60" 56"	11/10/12/15/ 12	Rock Core #1: -18.5to -23.5 MLLW - Highly to moderately fractured grey and pink Granitic Gneiss	-23
22.5	61%	60" 40"	8/8/7/8/9	Rock Core #2: -23.5 to -28.5 MLLW - Highly to moderately fractured grey and pink Granitic Gneiss	-28

Comments: Core run was completed at less revolutions per minute than recommended by core barrel manufacturer, drill time is not a good indicator of rock competency.

Refusal: -18.0' MLLW

Elevation of
Bedrock: -18.0' MLLW



BORING LOG

Date: 9/27/2010

Time: 11:50 AM

Project:	Phase IV Dredging	Project No: 6690.005	X: 816477.0
Location:	South Terminal Expansion		Y: 2688656.0
Elevation at mudline:	-17.4	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-46.2' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Todd Pentacost	Log By:	GAD
			Boring No: A-2010-B8
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 0"	WOR,WOR, WOR,WOR	No recovery sample taken	-19.4
4		24" 18"	WOR,WOR, WOR,WOR	Black, organic SILT	-21.4
6		24" 12"	8/13/24/31	4'-5' Black, organic SILT 5'-6' Lt. grey, fine to medium SAND and SILT, trace ROCK fragments	-23.4
8		24" 12"	26/21/56/48	Lt. grey, fine to medium SAND and SILT, trace ROCK fragments	-25.4
10		24" 0"	100-0"	No recovery sample taken, drilled with button toothes roller bit through cobbles	-27.4
13				Drilled with button tooth roller bit through cobbles	-30.4
15		24" 12"	46/39/23/24	13'-15' Olive grey, coarse SAND, trace fine SAND, trace fine GRAVEL	-32.4
17		24" 12"	13/17/14/21	Olive grey, coarse SAND, some fine SAND, trace ROCK fragments	-34.4
18				Drove casing to refusal, cleaned hole, and began core run at -36.2 MLLW	-34.5
23	53%	60" 54"	14/13/18/11/ 13	Rock Core #1: -36.2 to -41.2 MLLW - Intensely fractured dark grey Basalt(0-9.5"), moderately fractured pink and grey Granitic Gneiss (9.5-27"), dark grey intensely to moderately fractured Basalt (27"- 54").	-39.5
28	50%	60" 50"	12/15/11/12/ 14	Rock Core #2: - 41.2 to -46.2 MLLW - Intensely fractured dark grey Basalt (0-13"), moderately to intensely fractured pink and grey Granitic Gneiss (13"-19"), dark grey intensely to moderately fractured Basalt (19"-50").	-44.5

Comments: Core run was completed at less revolutions per minute than recommended by core barrel manufacturer, drill time is not a good indicator of rock competency.

Refusal: -34.5' MLLW

Elevation of
Bedrock: -34.5' MLLW



Date: 9/28/2010
Time: 11:10 AM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.005	X: 816215.8
Location:	South Terminal Expansion		Y: 2689415.8
Elevation at mudline:	-21.25	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-38.83' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Todd Pentacost	Log By:	GAD
			Boring No: A-2010-B9
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%					
2		24" 12"	WOR,WOR, WOR,WOR	Black, organic SILT	-23.25
4		24" 12"	10/24/22/19	2'-2.5' Black, organic SILT 2.5'-4' Olive grey, fine to medium SAND, some SILT, some angular fine GRAVEL	-25.25
6		24" 12"	56/33/27/52	Lt. grey, coarse sub rounded SAND, trace ROCK fragments in tip	-27.25
6.58		7" 7"	53/100-1"	Lt. grey, fine to medium SAND, trace SILT, trace ROCK fragments	-27.83
11.58	35%	60" 37"	6/7/7/6/9	Rock Core #1: -27.83 to -32.83 MLLW - Intensely fractured pink and grey Granitic Gneiss.	-32.83
12.58				Drilled with button tooth roller bit through fractured rock	-33.83
17.58	0%	60" 26"	(Frequent Jams)	Rock Core #2: -33.83 to -38.83 MLLW - Intensely fractured grey Gneiss	-38.83

Comments: Core run was completed at less revolutions per minute than recommended by core barrel manufacturer, drill time is not a good indicator of rock competency. On second run, core barrel was jammed in the boring. Decision was made to move 20' north in order to obtain confirmation cores.

Refusal: -27.83' MLLW

Elevation of
Bedrock: -27.83' MLLW



Date: 9/29/2010
Time: 12:18 PM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.005	X: 816207.2
Location:	South Terminal Expansion		Y: 2689452.9
Elevation at mudline:	-21.05	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-42.05' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Todd Pentacost	Log By:	GRM
			Boring No: A-2010-B9A
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
6				Boring A-2010-B9 advanced to confirm bedrock elevation for boring A-2010-B9. Boring A-2010-B9A located 20 feet to the north along the South Terminal Bulkhead from Boring A-2010-B9. See boring log for Boring A-2010-B9A for overburden information. Advanced casing to refusal, cleaned hole, and began core at -27.05' MLLW.	-27.05
11	65%	60" 57"	5/6/8/10/11	Rock Core #1: -27.05 to -32.05 MLLW - Intensely to moderately fractured dark grey Gneiss.	-32.05
16	44%	60" 48"	3/7/8/5/7	Rock Core #2: -32.05 to -37.05 MLLW - Intensely to moderately fractured dark grey Gneiss.	-37.05
21	37%	60" 33"	3/5/6/2/4	Rock Core #3: -37.05 to -42.05 MLLW - Intensely to moderately fractured dark grey Gneiss.	-42.05

Comments: Core run was completed at less revolutions per minute than recommended by core barrel manufacturer, drill time is not a good indicator of rock competency. Boring was completed to determine elevation of top of bedrock. Overburden sampling not completed on this hole. For representative information of overburden material, see boring log for Boring A-2010-B9

Refusal: -27.05' MLLW

Bedrock: -27.05' MLLW



Date: 2/21/2011
Time: 8:20 AM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816322
Location:	South Terminal Expansion		Y: 2688299
Elevation at mudline:	-0.9	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-50.79' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman	Log By:	GCD
			Boring No: A-2011-B10
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 12"	2,4,4,4	Dark grey, very fine SAND, little Organic SILT, trace SHELL HASH	-2.9
7		24" 18"	2,1,1,1	Black to dark grey, Organic SILT, little inorganic SILT, trace fine SAND	-7.9
12		24" 20"	33,33,30,32	4" - Black to dark grey, Organic SILT, little inorganic SILT, trace fine SAND Grey, fine to coarse SAND, little SILT, trace to little fine to coarse GRAVEL	-12.9
17		24" 14"	17,23,20,20	Grey, fine SAND, little medium to coarse SAND, trace fine to coarse GRAVEL, trace SILT, TILL	-17.9
19.05				Boulder encountered approx. elev.= -18.75 to -19.95 MLLW.	-19.95
22		24" 12"	16,41,46,35	Grey, fine to coarse SAND, some fine to coarse GRAVEL, little SILT, TILL	-22.9
27		24" 8"	98,36,44,57	Grey, becoming tan, fine to coarse SAND, some SILT, some fine to coarse GRAVEL, TILL.	-27.9
30.89				Drilled with mill tooth roller bit. Boulder encountered approx. elev. -29.60 to -30.40 MLLW. Cleaned hole and began core run at -31.79 MLLW.	-31.79
35.89	13%	5.0' 2.9'	5-5-5-5-15	Rock Core #1 -31.79 to -36.79 MLLW. Grey, intensely fractured to very intensely fractured Granitic GNEISS, sand filled seams throughout. Return water color changes at 2.3, 2.5, 2.8, 3.5-3.7, 3.9, 4.2. Barrel jamming last foot of run drilling time does not reflect hardness of rock.	-36.79
39.89	22%	5.0' 3.0'	4-3-3-10	Rock Core #2 -36.79 to -40.79 MLLW. Grey, intensely fractured to very intensely fractured Granitic GNEISS, with sand filled seams, Barrel jamming last foot of run drilling time does not reflect hardness of rock.	-40.79
44.89	50%	5.0' 5.0'	3-3-4-4-6	Rock Core #3 -40.79 to -45.79 MLLW. Grey, intensely to moderately fractured Granitic GNEISS,	-45.79
49.89	75%	5.0' 4.9'	5-4-3-3-3	Rock Core #4 -45.79 to -50.79 MLLW. Grey to pink, moderately to slightly fractured, Granite PEMATITE	-50.79

Comments:

Refusal: -31.79' MLLW

Elevation of
Bedrock: -31.79' MLLW



Date: 2/22/2011
Time: 12:42 PM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816397
Location:	South Terminal Expansion		Y: 2688013
Elevation at mudline:	-1.5	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-40.65' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman	Log By:	GCD
			Boring No: A-2011-B11
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 9"	2,3,4,4	Dark grey, fine to medium SAND, little organic SILT, little SHELL HASH	-3.5
7		24" 15'	1,WOH,WOH, 2	3" Black organic SILT, little SHELL HASH	
				12" Dark grey to black, fine SAND and organic/inorganic SILT, trace SHELL	-8.5
12		24" 14"	39,36,38,30	Grey, inorganic SILT and fine to medium SAND, trace fine to coarse GRAVEL, Till like	-13.5
16		12" 5"	57, 100/6"	Dark grey to black with brown, micaceous fine SAND and fine to coarse GRAVEL, little SILT.	-17.5
17.2				Boulder encountered approx. elev.= -17.5 MLLW to -18.7 MLLW.	-18.7
22		24" 12"	15,16,25,19	Tan grey, fine to medium SAND, little to trace SILT, Trace coarse SAND, trace fine GRAVEL	-23.5
25.83		10" 4"	55,100/4"	Tan, medium to coarse SAND, some fine to coarse GRAVEL, trace SILT. Cobble encountered at approximate elevation -27.33 MLLW.	-27.33
26.75				Drilled with mill tooth roller bit. Top of bedrock encountered at approx. elevation -28.25 MLLW.	-28.25
29.15				Drove casing to bedrock, drilled with mill tooth roller bit into rock and flushed casing before start of core run. Began first core run at -30.65 MLLW.	-30.65
31.75	74%	5.0' 4.9'	6-4-7-4-5	Rock Core #1 -30.65 to -35.65 MLLW Grey, moderately fractured Granitic GNEISS	-35.65
36.75	88%	5.0' 5.0'	4-4-5-5-5	Rock Core #2 -35.65 to -40.65 MLLW Grey, intensely to moderately fractured, Granitic GNEISS	-40.65

Comments: Drove casing to bedrock, drilled with mill-tooth roller bit into rock and flushed casing before start of core runs.

Refusal: -28.25' MLLW

Elevation of
Bedrock: -28.25' MLLW



Date: 2/23/2011
Time: 10:32 AM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816344
Location:	South Terminal Expansion		Y: 2687989
Elevation at mudline:	-1.2	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-49.15' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman	Log By:	GAD
			Boring No: A-2011-B12
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%					
2		24" 3"	4,1,WOH,2	Dark grey, very fine SAND, little organic SILT, little SHELL HASH	-3.2
7		24" 6"	1,1,1,30	Greenish dark grey, SILT, little fine to coarse GRAVEL	-8.2
12		24" 0"	36,22,25,23	No Recovery in Split Spoon	-13.2
17		24" 15"	15,10,12,25	Grey, fine to medium SAND and GRAVEL, trace SILT	-18.2
22		24" 6"	33,37,29,81	Light grey, fine to medium SAND and SILT, some medium GRAVEL.	-23.2
27.35				Drilled with mill tooth roller bit through cobbles with multiple sand seams. Encountered obstruction at approx. elev. -24.35 MLLW. Drilled through 1' boulder. Cleaned hole, and began core run at -26.15 MLLW.	-26.15
27.95	63%	3.0' 2.2'	no drill time available	Rock Core #1A -26.15 to -29.15 MLLW Grey and pink, moderately to intensely fractured, fresh to slightly weathered GRANITE pegmatite	-29.15
30.95	75%	2.0' 1.9'	no drill time available	Rock Core #1B -29.15 to -31.15 MLLW Grey and pink, moderately to intensely fractured fresh to slightly weathered granite PEGMATITE, shattered granite PEGMATITE -31.55 to -32.15 MLLW.	-32.15
34.95	82%	5.0' 5.0'	7-7-7-6-6	Rock Core #2 -31.15 to -36.15 MLLW Grey and pink, moderately to intensely fractured fresh to slightly weathered granite PEGMATITE, shattered granite PEGMATITE -35.65 to -36.15	-36.15
37.95	25%	3.0' 1.7'	4-4-5	Rock Core #3A -36.15 to -39.15 MLLW Grey and pink, intensely fractured, slightly weathered, granite PEGMATITE	-39.15
42.95	78%	5.0' 5.0'	4-3-4-4-4	Rock Core #3B -39.15 to -44.15 MLLW Grey, moderately fractured, fresh to slightly weathered, granitic GNEISS	-44.15
47.95	92%	5.0' 5.0'	4-4-3-5-4	Rock Core #4 -44.15 to -49.15 MLLW Grey, intensely to moderately fractured, fresh to slightly weathered, granitic GNEISS	-49.15

Comments: Drove casing to bedrock, drilled with mill-tooth roller bit into rock and flushed casing before start of core runs.

Refusal: -26.15' MLLW

Elevation of
Bedrock: -26.15' MLLW



Date: 2/24/2011

Time: 12:30 PM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816419
Location:	South Terminal Expansion		Y: 2687691
Elevation at mudline:	-1.3	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-46.6' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GAD
			Boring No: A-2011-B13
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 3"	WOH, WOH, WOH, WOH	Black, organic SILT, little SHELL HASH	-3.3
7		24" 15"	WOR,1,5,6	Greenish grey, fine SAND and SILT, trace SHELL HASH	-8.3
12		24" 0"	30,45,53,63	No Recovery in Split Spoon, piece of Granitic GNEISS in nose cone.	-13.3
17		24" 0"	54,58,61,71	No Recovery in Split Spoon, piece of Granitic GNEISS in nose cone. Encountered obstruction at approx. 18.5' below mudline - apparent 1' boulder.	-18.3
22		24" 2"	16,18,17,18	Grey, SILT, some fine to coarse GRAVEL	-23.3
27		24" 3"	18,21,23,20	Tan, coarse SAND and GRAVEL, trace fine SAND, trace SILT	-28.3
28.3				Casing advanced to refusal at -29.6 MLLW. Cleaned hole, and began core run at -29.6 MLLW.	-29.6
35.30	42%	7.0' 5.0'	4-5-6-5-4	Rock Core #1 -29.6' to -30.6' MLLW highly fractured Granitic GNEISS (potential cobble layer or obstruction). At approximate elev. -30.6' MLLW, core barrel penetrated potential cobble layer or obstruction and entered a 2' layer of apparent sediment. Wash changed color from milky white to tan, and contained sand. Top of bedrock estimated to be at bottom of sediment layer, -32.6 MLLW. Continued coring from -32.6 MLLW to -36.6 MLLW - fractured Granitic GNEISS.	-36.6
40.30	79%	5.0' 5.0'	5-4-3-4-5	Rock Core #2 -36.6 to -41.6 MLLW fractured Granitic GNEISS	-41.6
45.30	51%	5.0' 4.8	6-5-7-7-6	Rock Core #3B -41.6 to -46.6 MLLW fractured Granitic GNEISS	-46.6

Comments:

Refusal: -29.6' MLLW

Elevation of

Bedrock: -32.6' MLLW



Date: 2/24/2011
Time: 12:30 PM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816360
Location:	South Terminal Expansion		Y: 2687402
Elevation at mudline:	-1.85	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-31.95' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GAD
			Boring No: A-2011-B14
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 6"	WOR, WOR, WOR, WOR	Black, organic SILT	-3.85
7		24" 15"	51,48,49,55	6" OF Light grey, fine SAND and SILT, Light grey, fine to medium SAND, trace SILT	-8.85
12		24" 10"	63,58,52,58	8" Lt grey, fine to medium SAND, trace SILT, becomes lt. grey, fine to coarse SAND, trace SILT, trace GRAVEL, 0.8' boulder encountered -14.2' MLLW	-13.85
17		24" 4"	24,9,10,14	Grey, fine to coarse SAND and fine GRAVEL.	-18.85
20.1				Encountered bedrock at -20.45 MLLW. Drilled with mill-tooth roller bit to -21.95 MLLW, cleaned hole, seated casing, and began core run.	-21.95
25.10	67%	5.0' 4.9'	6-8-8-7-8	Rock Core #1 -21.95 to -26.95 MLLW 4.5' fractured grey Granitic GNEISS, 0.4' pink Granite PEGMATITE	-26.95
30.10	60%	5.0' 5.1	5-5-5-5-5	Rock Core #2 -26.95 to -31.95 MLLW 0.5' pink Granite PEGMATITE, 0.3' shattered interface, grey fractured Granitic GNEISS	-31.95

Encountered bedrock at approx. elevation -20.45' MLLW, drilled with mill-tooth roller bit into rock
Comments: and seated casing before start of core run.

Refusal: -20.45' MLLW
Elevation of
Bedrock: -20.45' MLLW



Date: 3/2/2011

Time: 7:15 AM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816254
Location:	South Terminal Expansion		Y: 2687498
Elevation at mudline:	-0.6	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-40.55' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GAD
			Boring No: A-2011-B15
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 18"	WOR, WOR, WOR, WOR	Black, organic SILT	-2.6
7		24" 18"	3,3,3,10	12" Black, organic SILT 6" Black, fine SAND and organic SILT	-7.6
12		24" 6"	33,40,34,56	Light grey, fine to coarse SAND, some fine GRAVEL	-12.6
17		24" 8"	31,76,40,27	Grey, medium to coarse SAND, trace fine SAND, trace SILT	-17.6
19.5		6" 6"	100/6"	Blue grey, fine to coarse SAND, trace rock fragments. Refusal at -20.10' MLLW.	-20.1
19.95				Casing advanced to top of bedrock at -20.55 MLLW. Cleaned hole, and began core run at -20.55 MLLW.	-20.55
24.95	44%	5.0' 5.0'	6-5-7-6-5	Rock Core #1 -20.55 to -25.55 MLLW 0.0 -1.0' moderate to intensely fractured dark grey DIABASE, 1.0-4.6 moderately to intensely fractured grey granitic GNEISS, 4.6'-5.0' interface of grey granitic GNEISS and dark grey DIABASE	-25.55
29.95	59%	5.0' 5.0'	5-6-6-5-6	Rock Core #2 -25.55 to -30.55 MLLW 0.0-0.75' intensely to moderately fractured grey granitic GNEISS, 0.75-1.75 intensely to moderately fractured dark grey DIABASE, 1.75'-4.8' moderately fractured grey granitic GNEISS showing reoriented gneissic banding, 4.8'-5.0 DIABASE	-30.55
34.95	68%	5.0' 5.0'	6-5-6-7-6	Rock Core #3 -30.55 to -35.55 MLLW 0.0-0.9' moderately fractured green grey DIABASE, 0.9-5.0 moderately fractured contact metamorphic and igneous mixing zone Gneiss and Diabase Xenoliths in GRANITE PEGMATITE.	-35.55
39.95	38%	5.0' 5.1'	7-6-7-7-8	Rock Core #4 -35.55 to -40.55 MLLW moderately fractured contact metamorphic and igneous mixing zone Gneiss and Diabase Xenoliths in GRANITE PEGMATITE.	-40.55

Comments: DIABASE in this boring is moderately to highly weathered. The descriptions of the rock in the cores above are descriptions of the sampled rock in each recovered core length.

Refusal: -20.10' MLLW
Elevation of
Bedrock: -20.55' MLLW



Date: 3/3/2011
Time: 8:20 AM

BORING LOG

Project:	Phase IV Dredging	Project No:	6690.008	X:	816262
Location:	South Terminal Expansion	Y:	2688283		
Elevation at mudline:	-0.4	Datum:	MLLW		
Casing Type:	Steel	Boring Depth:	-50.45' MLLW	Boring No:	A-2011-B16
Casing Diameter:	4"	Drill Rig:	CME 45		
Drill Co:	NH Boring	Method:	Drill and Wash	Sheet:	1 of 1
Driller:	Norman Stuttard	Log By:	GCD		

Depth below mudline (ft)	RQD	Penetration/Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 14"	11,12,10,2	Grey, fine SAND, little SILT, trace SHELL HASH	-2.4
7		24" 12"	2,2,3,4	Dark grey, organic SILT, trace SHELL HASH, grades to GREY, inorganic and organic SILT, and very fine SAND, trace SHELL HASH	-7.4
12		24" 14"	60,33,29,48	Grey brown fine to coarse SAND and SILT trace fine to coarse GRAVEL, TILL	-12.4
17		24" 9"	13,20,47,25	Grey, fine SAND, some medium to coarse SAND, little fine to coarse GRAVEL, little SILT.	-17.4
22		24" 14"	50,43,46,29	Grey, SILT some fine to coarse SAND, little fine to coarse GRAVEL, TILL, obstruction encountered -22.65' to approx. -24.05 MLLW (see comments).	-22.4
27		24" 6"	16,23,57,27	Grey and yellow brown, SILT and fine to coarse Gravel, little fine to coarse SAND, TILL.	-27.4
28.05				Drilled with mill tooth roller bit until obstruction encountered -27.95' MLLW. Continued drilling to confirm top of bedrock from cuttings in wash. Cleaned hole, and began core run at -28.45 MLLW.	-28.45
33.05	72%	5.0' 4.9'	5-7-8-22-7	Rock Core #1 -28.45 to -33.45 MLLW 0.0 -1.0' moderate to intensely fractured grey granitic GNEISS	-33.45
38.15	60%	5.0' 5.0'	5-5-7-7-7	Rock Core #2 -33.45 to -38.55 MLLW 0.0'-5.0' intensely to moderately fractured granitic GNEISS, shattered pegmatic intrusion 0.4'-0.9', high angle fractures @ 1.9-2.2' and 4.5-5.0'	-38.55
43.15	30%	5.0' 5.0'	7-16-6-8-7	Rock Core #3 -38.55 to -43.55' MLLW 0.0-1.4' intensely to moderately fractured grey, granitic GNEISS, 1.4-4.3' intensely to moderately fractured grey GRANITE, 4.3-5.0' intensely to moderately fractured grey granitic GNEISS, core jammed in barrel 1.4'	-43.55
48.15	77%	5.0' 4.8'	6-15-7-6-7	Rock Core #4 -43.55 to -48.55 MLLW moderately fractured grey, granitic GNEISS	-48.55
50.05	100%	1.9 1.9	7-15	Rock Core #5 -48.55 to -50.45' MLLW slightly fractured grey, granitic GNEISS	-50.45

Comments: Obstruction encountered at -22.65' MLLW was not penetrated by roller bit, began coring at -23.25, core barrel exited boulder at 24.05, and soil cuttings in wash suggest till material encountered in interval above. The descriptions of the rock in the cores above are descriptions of the sampled rock in each recovered core length.

Refusal: -27.95
Elevation of Bedrock: -27.95



BORING LOG

Date: 3/8/2011
Time: 8:40 AM

Project:	Phase IV Dredging	Project No: 6690.008	X: 816220
Location:	South Terminal Expansion		Y: 2689671
Elevation at mudline:	-20.8	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-36.4 MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GAD
			Boring No: A-2011-B17
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 8"	WOR,WOR, WOR,WOR	Black, organic SILT	-22.8
6.25		15" 9"	30,23, 100/3"	Greenish grey, fine to coarse SAND, some fine gravel	-27.05
8.5				Encountered Obstruction -28.9' MLLW, drilled with roller bit to -29.3' MLLW, then attempted core run.	-29.3
9.5	N/A	1.0' 1.0'	7	Rock Core #1 -29.3 to -30.3 MLLW - Penetrated obstruction (boulder). One foot of recovery in core barrel.	-30.3
15.6				Wash water indicates a series of nested boulders or highly fractured rock below obstruction. Unable to advance casing past obstruction. Drilled with roller bit through obstruction until top of competent rock (interpreted from cuttings in wash water). Final elevation at -36.4 MLLW.	-36.4

Comments:

Refusal: -28.9 MLLW
Elevation of
Bedrock: -36.4 MLLW



Date: 3/9/2011
Time: 8:15 AM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816257
Location:	South Terminal Expansion		Y: 2688603
Elevation at mudline:	-20.9	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-48.4' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Boring No: A-2011-B18
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 3"	WOR, WOR, WOR, WOR	Black, organic SILT, trace shell hash.	-22.9
7		24" 10"	7,9,15,19	First 6" - Gray, medium to coarse SAND and GRAVEL, some shell hash. Last 4" Light brown, fine to coarse SAND, trace silt.	-27.9
10				Obstruction encountered -28.1' MLLW. Drilled with mill tooth roller bit through obstruction (approximately 8" thick). Collected split spoon from 10-12 feet.	-30.9
11.75		24" 8"	19,27,22,44	Light brown to gray, fine to coarse SAND, trace silt.	-32.65
12.5				Obstruction encountered -32.65' MLLW. Continued drilling to confirm top of bedrock. Cleaned hole and began core run at -33.4 MLLW.	-33.4
17.5	68%	5.0' 4.75'	10-8-8-9-8	Rock Core #1 -33.4 to -38.4 MLLW 0.0'-2.7' Intensely to moderately fractured moderate to slightly weathered grey granitic GNEISS. 2.7' to 4.75' moderately to slightly weathered dark grey DIABASE.	-38.4
22.5	20%	5.0' 5.0'	8-9-8-8-9	Rock Core #2 -38.4 to -43.4 MLLW 0.0'-5.0' Intensely fractured moderately to slightly weathered dark grey DIABASE, iron stained vertical fractures from 3.4' to 5.0'.	-43.4
27.5	46%	5.0' 5.0'	8-9-8-8-8	Rock Core #3 -43.4 to -48.4' MLLW 0.0'-2.6' Intensely fractured moderately fracture dark gray DIABASE. 2.6' - 4.4' moderately fractured granitic GNEISS, 4.4' - 5.0' moderately fractured gray DIABASE.	-48.4

Comments:

Refusal: -32.65 MLLW
Elevation of
Bedrock: -32.65 MLLW



BORING LOG

Date: 3/10/2011
Time: 8:00 AM

Project:	Phase IV Dredging	Project No: 6690.008	X: 816372
Location:	South Terminal Expansion		Y: 2689000
Elevation at mudline:	-19.5	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-39.85' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Boring No: A-2011-B19
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 6"	WOR, WOR, 5, 5	Black, organic SILT.	-21.5
5.25		3" 3"	100-3"	Gray, medium to coarse SAND, trace fine sand.	-24.75
7.45				Obstruction encountered at -24.7 MLLW. Drilled with roller bit through obstruction. After penetration of obstruction, tool dropped approximately 0.5 feet. Obstruction encountered at -26.9 MLLW.	-26.9
10.4				Drilled with roller bit through obstruction. After penetration of obstruction, tool dropped approximately 0.3 feet. Roller bit then advanced another 0.6 feet. Top of bedrock encountered at -29.85 MLLW. Cleaned hole and prepared for core run.	-29.85
15.4	65%	5.0' 5.0'	8-8-8-9-8	Rock Core #1 -29.85 to -34.85 MLLW - 0"-37" Moderately to intensely fractured grey Granitic GNEISS, 37"-60" Moderately to intensely fractured pink grey Granite PEGMATITE.	-34.85
20.4	54%	5.0' 4.42'	8-9-8-8-9	Rock Core #2 -34.85 to -39.85 MLLW - 0"-20" Moderately to intensely fractured pink grey Granite PEGMATITE, 20"-53" Moderately to intensely fractured grey Granitic GNEISS.	-39.85

Comments:

Refusal: -24.7 MLLW
Elevation of
Bedrock: -29.85 MLLW



Date: 3/14/2011
Time: 8:50 AM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816746
Location:	South Terminal Expansion		Y: 2687940
Elevation at mudline:	-5.1	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-46.65' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Boring No: A-2011-B20
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 7"	3,3,3,6	First 5" - Black fine to coarse SAND and organic SILT. Next 2" - Grey fine to coarse SAND, some inorganic silt.	-7.1
7.5		30" 0"	8,2,2,WOH	No Recovery	-12.6
12		24" 13"	25,26,21,28	Grey, fine to coarse SAND, some silt, little fine to coarse gravel.	-17.1
16.1		13" 7"	13,25, 100/1"	Grey fine SAND and SILT, little fine to coarse gravel.	-21.2
17.7				Obstruction encountered at -21.2 MLLW. Penetrated obstruction (8" thick) with roller bit to -22.8 MLLW.	-22.8
19.7		24" 7"	110,67,60, 27	Encountered second obstruction at -22.8 MLLW. Advanced roller bit through second obstruction and encountered coarse sand in drill cuttings. Advanced split spoon from -22.80 to -24.80 MLLW - Dark grey fine to coarse GRAVEL and SILT, little fine to coarse sand (till).	-24.8
25.07		2" 0"	110/2"	No recovery. Dark grey granite in light grey silty drill wash.	-30.17
29.9		0" 0"	100/0"	No recovery.	-35
31.55				Roller bit advanced to Top of Bedrock at elevation -36.65 MLLW. Cleaned hole and prepared for core run.	-36.65
36.6	40%	5' 5'	5-5-6-6-6	Rock Core #1 -36.65 to -41.65 MLLW 0.0'-4.0' Intensely to very intensely fractured grey GNEISS, moderately to intensely fractured pink grey Granite PEGMATITE.	-41.65
41.6	40%	5' 4.0'	6-2-6-6-10	Rock Core #2 -41.65 to -46.65 MLLW - 0.0' - 3.1' Intensely to very intensely fractured pink grey Granite PEGMATITE, 3.1-4.0' intensely to very intensely fractured moderately weathered grey Granitic GNEISS. Core barrel penetrated a sediment-filled seam from between 1.3 to 2.0 feet.	-46.65

Comments:

Refusal: -30.17 MLLW
Elevation of
Bedrock: -36.65 MLLW



Date: 3/15/2011
Time: 8:00 AM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816566
Location:	South Terminal Expansion		Y: 2688336
Elevation at mudline:	-7	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-47.7' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Boring No: A-2011-B21
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 18"	WOR, WOR, WOR, WOR	Black, organic SILT and fine SAND.	-9
7		24" 12"	16,16,18,20	Greenish-gray, fine to medium SAND, trace silt.	-14
12		24" 11"	36,27,38,35	Gray, fine to medium SAND, trace silt, trace fine gravel.	-19
12.1				Obstruction encountered at -19.1 MLLW. Penetrated obstruction with roller bit.	-19.1
15.9		11" 2"	36,100/5"	Gray, fine to coarse SAND and SILT, trace fine gravel.	-22.9
22.35		5' 3'	9,7,8,8,8	Encountered second obstruction at -23.95 MLLW. Roller bit advanced to elevation -24.35 MLLW. Cleaned hole and prepared for core run. Core run revealed nested boulders with seams of sediment. 1st Boulder estimated at 1.6 feet in length, 2nd Boulder at 0.3 feet in length, and 3rd boulder at 1.1 feet in length.	-29.35
27.6		24" 6"	25,20,12,10	Light gray, fine to coarse SAND and GRAVEL, trace silt.	-34.6
29.9		0" 0"	100/0"	Roller bit advanced to Top of Bedrock at elevation -36.9 MLLW. Split spoon attempted at this elevation was 100/0". Cleaned hole and prepared for core run.	-36.9
31.9	28%	1.8' 1.33	7,14	Rock Core #1 -36.9 to -38.7 MLLW 0.0'-1.33' Intensely to moderately fractured pink grey Granite PEGMATITE with xenoliths of granite, diabase and granitic gneiss.	-38.9
35.9	63%	4' 4'	8,7,6,9	Rock Core #2 -38.7 to -42.7 MLLW 0.0'-4.0' Intensely to moderately fractured grey Granite PEGMATITE with xenoliths of granite, gneiss, and diabase.	-42.7
40.9	50%	5' 5'	6,8,9,6,6	Rock Core #3 -42.7 to -47.7 MLLW 0.0'-5.0' Intensely to moderately fractured grey Granite PEGMATITE with xenoliths of granite, gneiss, and diabase.	-47.7

Comments:

Refusal: -36.9 MLLW
Elevation of
Bedrock: -36.9 MLLW



Date: 3/16/2011
Time: 10:00 AM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816496
Location:	South Terminal Expansion		Y: 2689220
Elevation at mudline:	-5.7	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-50' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 3"	WOR, WOR, WOR, WOR	Black, organic SILT and shell hash.	-7.7
7		24" 18"	14,14,16,15	Greenish gray, fine SAND, trace silt, trace shell hash.	-12.7
12		24" 6"	10,10,10,10	Gray, fine to medium SAND, trace coarse sand.	-17.7
16.9		23" 5"	7,7,14, 100/5"	Gray, fine to coarse SAND.	-22.9
19.55		0" 0"	100/0"	No Recovery.	-25.55
24.92		5' 3'	9,7,8,8,8	Encountered obstruction at -25.55 MLLW. Roller bit advanced to bottom of obstruction at -26.3 MLLW. Roller bit advanced to -27.45 MLLW. Telescope set up to advance casing through obstruction to -30.62 MLLW.	-30.62
25.92		11" 0"	35,100/5"	No recovery.	-31.62
29.45		0" 0"	100/0"	Roller bit advanced to Top of Bedrock at elevation -35.15 MLLW. Cleaned hole and began core run at -36.25 MLLW.	-35.15
34.30		1.8' 1.55'	8,5,7	Rock Core #1 -36.25 to -38.05 MLLW - Core run revealed a series of nested boulders and/or fractured rock. Roller bit advanced to -40 MLLW.	-40
39.3	48%	5' 4.3'	5,3,5,6,6	Rock Core #2 -40 to -45 MLLW 0.0'-5.0' Intensely to moderately fractured dark grey granitic GNEISS, Slightly to moderately weathered in fractures 2.5'-4.2' and 1.9'	-45
44.3	44%	5' 4.85'	5,7,6,7,8	Rock Core #3 -45 to -50 MLLW 0.0-1.5' Intensely to moderately fractured dark grey GNEISS, 1.5' - 4.8' Moderately fractured pink grey granite PEGMATITE.	-50

Comments:

Refusal: -25.15 MLLW
Elevation of
Bedrock: -35.15 MLLW



Date: 3/17/2011
Time: 1:00 PM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816606
Location:	South Terminal Expansion		Y: 2687892
Elevation at mudline:	-10.65	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-38.65' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Boring No: A-2011-B23
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 8"	WOR, WOR, WOR, WOR	Top 4": Black, organic SILT. 4": Dark gray, fine to medium SAND and SILT, trace shell hash.	Last -12.65
7		24" 12"	13,13,17,21	Light gray, fine to coarse SAND.	-17.65
10		0" 0"	100/2"	No recovery.	-20.55
18.25				Obstruction encountered at -23.4 MLLW. Advanced roller bit through a series of obstructions, believed to be either a series of boulders or rock fragments to MLLW.	-28.85 -28.85
18.25		0" 0"	100/0"	No recovery.	-28.85
18.25				Advanced roller bit to bedrock. Cleaned hole and began core run at -28.85 MLLW.	-28.85
23	65%	4.8' 4.55'	8,9,9,10,11	Rock Core #1: -28.85 to -33.65 MLLW 0.0'-4.8' Intensely to moderately fractured pink grey GRANITE.	-33.65
28	85%	5' 5'	8,8,7,9,9	Rock Core #2: -33.65 to -38.65 MLLW 0.0'-5.0' Moderately fractured pink grey granitic GNEISS.	-38.65

Comments:

Refusal: -20.55 MLLW
Elevation of
Bedrock: -28.85 MLLW



BORING LOG

Date: 3/21/2011
Time: 8:00 AM

Project:	Phase IV Dredging	Project No: 6690.008	X: 816632
Location:	South Terminal Expansion		Y: 2688166
Elevation at mudline:	-6.85	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-45.05' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 18"	WOR, WOR, 1, 1	Top 12": Black, organic SILT, trace shell hash. Next 3": Gray, fine SAND and SILT, trace shell hash. Last 3": Light brown fine SAND and SILT, trace shell hash.	-8.85
7		24" 12"	14,10,10,12	Gray, fine to medium SAND, trace coarse sand, trace shell hash.	-13.85
12		24" 10"	21,20,12,10	Light gray, medium to coarse SAND, trace fine sand, trace shell hash.	-18.65
15				Obstruction encountered at -21.3 MLLW. Advanced roller bit through obstruction to -21.85 MLLW for next split-spoon.	-21.85
17		24" 12"	44,54,40,30	Light gray, fine to coarse SAND, some silt, trace fine gravel.	-23.85
22		24" 18"	13,12,23,16	Light gray, fine to coarse SAND, some silt and some fine gravel.	-28.85
25.92		11" 5"	46, 100/5"	Light gray, medium to coarse SAND, trace silt, trace fine gravel.	-32.76
28.2				Bedrock encountered at -33.25 MLLW. Advanced roller bit to -35.05 MLLW, cleaned hole and began core run.	-35.05
33.2	64%	5' 5'	6,6,6,6,6	Rock Core #1: -35.05 to -40.05 MLLW 0.0'-5.0' Intensely to moderately fractured grey granitic GNEISS.	-40.05
38.2	83%	5' 4.85'	7,6,6,6,6	Rock Core #2: -40.05 to -45.05 MLLW Intensely to moderately fractured grey granitic GNEISS.	-45.05

Comments:

Refusal: -32.76 MLLW
Elevation of
Bedrock: -33.25 MLLW



BORING LOG

Date: 3/22/2011
Time: 9:45 AM

Project:	Phase IV Dredging	Project No: 6690.008	X: 816289
Location:	South Terminal Expansion		Y: 2687745
Elevation at mudline:	-1.2	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-34.74' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Boring No: A-2011-B25
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 0"	WOR, WOR, WOR, WOR	No recovery.	-3.2
7		24" 6"	WOR, WOR, WOR, WOR	Black fine SAND and SILT, some shell hash.	-8.2
10		24" 12"	7,14,30,38	Gray, fine to coarse SAND, trace silt, trace fine gravel.	-11.2
15		24" 5"	29,31,36,43	Light gray fine to coarse SAND, trace silt.	-16.2
20		24" 10"	36,65,31,41	Light gray, fine to coarse SAND, trace silt, trace fine gravel	-21.2
22.54				Obstruction encountered at -22.35 MLLW (presumed elevation of bedrock). Advanced roller bit through obstruction (0.8 feet in length) to -23.15 MLLW. Advanced roller bit to -23.74 MLLW. Cleaned hole and began core run.	-23.74
25.54	31%	3' 2.35'	7,6,7	Rock Core #1: -23.74 to -26.74 MLLW Intensely to very intensely fractured grey granitic GNEISS.	-26.74
28.54	58%	3' 2.7'	6,5,5	Rock Core #2: -26.74 to -29.74 MLLW Intensely to moderately fractured grey granitic GNEISS.	-29.74
33.54	72%	5.0' 5.0'	7,6,7	Rock Core #1: -29.74 to -34.74 MLLW Intensely to moderately fractured pink grey granitic GNEISS.	-34.74

Comments:

Refusal: -22.35 MLLW
Elevation of
Bedrock: -22.35 MLLW



Date: 3/23/2011
Time: 11:15 AM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816522
Location:	South Terminal Expansion		Y: 2688815
Elevation at mudline:	-16.75	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-47.65' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Boring No: A-2011-B26
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 5"	WOR, WOR, WOR, WOR	Black, fine SAND and organic SILT, trace shell hash.	-18.75
7		24" 12"	53,43,41,52	Top 6": Gray, fine to medium SAND. Middle 3": Black, fine to medium SAND, trace fine gravel. Bottom 3": Light gray fine to coarse SAND and fine GRAVEL, some pir stone fragments.	-23.75
10.25				Obstruction encountered at -24.8 MLLW. Advanced roller bit through boulder to elevation -27.0 MLLW.	-27
13.4		24" 6"	64,37,32,49	Light gray, fine to coarse SAND, trace silt, trace fine gravel.	-30.15
14				Obstruction encountered at -30.15 MLLW. Advanced roller bit through obstruction -30.75 MLLW.	-30.75
18.2		10" 4"	34, 100/4"	Light gray, coarse SAND and fine GRAVEL, trace stone fragments.	-34.98
20.9				Advanced roller bit thru cobbles or fractured bedrock to -37.65 MLLW. Cleaned hole and began core run.	-37.65
25.9	47%	5' 5'	5,5,6,6,6	Rock Core #1: -37.65 to -42.65 MLLW 0.0' - 3.6' Intensely to moderately fractured dark grey DIABASE, 3.6'-5.0' Intensely to very intensely fractured dark grey DIABASE.	-42.65
30.9	26%	5' 4.2'	6,4,5,6,6	Rock Core #2: -42.65 to -47.65 MLLW 0.0'-1.3' Intensely to very Intensely fractured dark grey DIABASE highly weathered at interface, 1.3'-4.0' Intensely to moderately fractured grey granitic GNEISS	-47.65

Comments:

Refusal: -34.98
Elevation of
Bedrock: -37.65



BORING LOG

Date: 3/25/2011
Time: 12:30 PM

Project:	Phase IV Dredging	Project No: 6690.008	X: 816356
Location:	South Terminal Expansion		Y: 2689759
Elevation at mudline:	-13.75	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-42.05' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Boring No: A-2011-B27
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 6"	WOR, WOR, WOR, WOR	Black, fine SAND and SILT, trace shell hash.	-15.75
7		24" 16"	9,9,12,16	Top 3" - Gray, fine SAND, trace silt, trace fine gravel. Next 1/2" - Black, fine SAND, trace silt. Next 3" - Orange-brown, fine to coarse SAND, trace silt. Last 3" - Gray, fine to coarse SAND, trace silt.	-20.75
12		24" 15"	15,20,22,21	Top 10" - Gray, fine SAND and SILT, trace coarse sand and shell hash. Bottom 5" - Orange-brown, fine to coarse SAND and SILT, trace fine gravel.	-25.75
17		24" 4"	12,12,14,14	Gray, fine to coarse SAND and SILT, trace fine gravel, trace shell hash.	-30.75
21		12" 4"	62,80, 100/0"	Gray, fine to coarse SAND, trace silt and fine gravel.	-34.75
25				Obstruction encountered at -35.2. Advanced roller bit through obstruction to elevation -38.30 MLLW.	-38.3
26.5		18" 16"	50,125, 172/6"	Tan, coarse to medium SAND, trace silt.	-40.25
28.3				Advanced roller bit to elevation -42.05 MLLW.	-42.05
				End of Boring	

Comments:

Refusal: N/A
Elevation of
Bedrock: N/A



BORING LOG

Date: 3/28/2011
Time: 9:29 AM

Project:	Phase IV Dredging	Project No: 6690.008	X: 816775
Location:	South Terminal Expansion		Y: 2687636
Elevation at mudline:	-5.2	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-24.0' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Boring No: A-2011-B28
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 14"	WOR, WOR, WOR, WOR	Black, organic SILT, trace fine to coarse sand, trace shell hash.	-7.2
4		24" 16"	10,6,10,12	Grey, fine to medium SAND, little shell hash.	-9.2
6		24" 16"	9,12,11,13	Tan to grey, very fine SAND, trace inorganic silt.	-11.2
8		24" 7"	10,18,17,18	Grey, fine SAND, little inorganic silt, little medium to coarse sand, trace gravel.	-13.2
10		24" 9"	10,20,29,32	Grey fine SAND, little silt, trace coarse gravel.	-15.2
12		24" 12"	20,27,29,43	Grey fine to coarse SAND, little silt, little fine to coarse gravel.	-17.2
13		12" 6"	24,37, 100/0"	Grey, fine to coarse SAND, little silt, little fine to coarse gravel.	-18.2
14.3				Encountered obstruction at -19.5 MLLW. Cleaned hole and began core run.	-19.5
18.8	36%	4.5' 4.5'	5,4,5,5	Rock Core #1: -19.5 to -24.0 MLLW - Intensely to moderately fractured pink grey granitic GNEISS.	-24.0

Comments: Intervals 0-2, 2-4. and 4-6 Sampled using a 3" diameter split spoon sampler, all of the other intervals were sampled using a standard 2" diameter split-spoon.

Refusal: -18.2 MLLW
Elevation of
Bedrock: -19.5 MLLW



Date: 3/29/2011
Time: 7:00 AM

BORING LOG

Project:	Phase IV Dredging	Project No:	6690.008	X:	816162
Location:	South Terminal Expansion			Y:	2689857
Elevation at mudline:	-27.75	Datum:	MLLW		
Casing Type:	Steel	Boring Depth:	-40.3' MLLW	Boring No:	A-2011-B29
Casing Diameter:	4"	Drill Rig:	CME 45		
Drill Co:	NH Boring	Method:	Drill and Wash	Sheet:	1 of 1
Driller:	Norman Stuttard	Log By:	GCD		

Depth below mudline (ft)	RQD	Penetration/Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 9"	WOR, WOR, WOR, WOR	Black, organic SILT, trace fine sand, thin, hair-like filiments.	-29.75
6.25		15" 3"	WOR, WOR, 100/3"	Tan to grey, fine to medium SAND, some silt.	-34
7.55				Advanced roller bit through gravel/cobbles. Cleaned hole and prepared to core at -35.3 MLLW.	-35.3
12.55	82%	5' 4.2'	5,6,6,7,6	Rock Core #1: -35.3 to -40.3 MLLW - Moderately to slightly fractured grey and pink granitic GNEISS.	-40.3

Comments:

Refusal: -34 MLLW
Elevation of
Bedrock: -35.3 MLLW



BORING LOG

Date: 3/29/2011
Time: 1:00 PM

Project:	Phase IV Dredging	Project No: 6690.008	X: 816617
Location:	South Terminal Expansion		Y: 2688559
Elevation at mudline:	-7.8	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-36.6' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Boring No: A-2011-B30
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/ Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 6"	WOR, 2,2,2	Black, organic SILT and very fine SAND, little shell hash.	-9.8
7		24" 10"	10,12,10,13	Grey fine SAND, little medium to coarse sand. Grades to grey-tan medium SAND, little fine to coarse SAND.	-14.8
12		24" 10"	20,29,25,23	Grey fine to coarse SAND, some silt, little fine to coarse gravel.	-19.8
17		24" 3"	33,25,27,32	Grey fine to coarse SAND, some silt, little fine to coarse gravel (TILL).	-24.8
21.6		24" 5"	57,27,59, 126	Grey, fine to coarse GRAVEL and fine to coarse SAND, little silt (TILL).	-29.4
25.95		24" 2.5"	21,15,67,29	Coarse GRAVEL, some fine to medium sand, some silt (TILL).	-33.75
28.8				Refusal at -33.75 MLLW. Advanced roller bit through obstruction to -35.15 MLLW Competent rock determined to be at -36.60 MLLW. No rock core conducted.	-36.6
				End of Boring	

Comments:

Refusal: -33.75 MLLW
Elevation of
Bedrock: -36.6 MLLW



BORING LOG

Date: 3/30/2011
Time: 10:05 AM

Project:	Phase IV Dredging	Project No:	6690.008	X:	816259
Location:	South Terminal Expansion			Y:	2689246
Elevation at mudline:	-20.85	Datum:	MLLW		
Casing Type:	Steel	Boring Depth:	-57.65' MLLW	Boring No:	A-2011-B31
Casing Diameter:	4"	Drill Rig:	CME 45		
Drill Co:	NH Boring	Method:	Drill and Wash	Sheet:	1 of 1
Driller:	Norman Stuttard	Log By:	GCD		

Depth below mudline (ft)	RQD	Penetration/Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
2		24" 3"	WOR, WOR, WOR, WOR	Black, organic SILT trace shell hash.	-22.85
7		24" 4"	16,27,31,40	Gray, medium to coarse SAND and fine GRAVEL, trace silt.	-27.85
8.35				Obstruction encountered at -28.3 MLLW. Advanced roller bit through obstruction until -29.2 MLLW.	-29.2
12		24" 6"	47,22,23,18	Gray, fine to coarse SAND, little fine gravel, trace silt.	-32.85
14.5				Obstruction encountered at -34.4 MLLW. Advanced roller bit through obstruction until -35.35 MLLW.	-35.35
16.8				Advanced roller bit to -37.65 MLLW. Cleaned hole and began core run.	-37.65
21.8	64%	5' 4.8'	5,3,4,5,5	Rock Core #1: -37.65 to -42.65 MLLW - Intensely to moderately fractured grey to dark grey granitic GNEISS.	-42.65
26.8	73%	5' 4.9'	6,5,4,4,4	Rock Core #2: -42.65 to -47.65 MLLW - 0.0-1.25' Intensely to moderately fractured pink grey GRANITE, 1.25-4.9' Intensely to moderately fractured dark grey granitic GNEISS.	-47.65
31.8	58%	5' 4.9'	5,5,5,5,5	Rock Core #3: -47.65 to -52.65 MLLW - Intensely fractured dark grey GNEISS	-52.65
36.8	78%	5' 5'	5,5,5,5,5	Rock Core #4: -52.65 to -57.65 MLLW - Intensely to moderately fractured dark grey GNEISS	-57.65

Seismic Boring #1 Location

Comments:

Refusal: -34.4 MLLW
Elevation of
Bedrock: -37.65 MLLW



Date: 3/31/2011

Time: 11:00 AM

BORING LOG

Project:	Phase IV Dredging	Project No: 6690.008	X: 816364
Location:	South Terminal Expansion		Y: 2688225
Elevation at mudline:	-0.8	Datum:	MLLW
Casing Type:	Steel	Boring Depth:	-46.6' MLLW
Casing Diameter:	4"	Drill Rig:	CME 45
Drill Co:	NH Boring	Method:	Drill and Wash
Driller:	Norman Stuttard	Log By:	GCD
			Boring No: A-2011-B32
			Sheet: 1 of 1

Depth below mudline (ft)	RQD	Penetration/Recovery	Blows per 6" / Drill Min. per Foot	Description (Color, Texture, Structure)	Elevation (MLLW)
				Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
25.8		24" 3"	WOR, WOR, WOR, WOR	Encountered first obstruction at -25.7 MLLW. Advanced roller bit to -26.6 MLLW, cleaned hole and began core run.	-26.6
30.8	58%	5' 4.8'	4,4,4,4,4	Rock Core #1: -26.6 to -31.6 MLLW - 0.0'-3.25' Slightly fractured pink grey granitic GNEISS 3.25'-4.8' Intensely fractured highly weathered grey granitic GNEISS grades to unweathered quartz rich GRANITE.	-31.6
35.8	32%	5' 4.3'	6,5,5,5,4	Rock Core #2: -31.6 to -36.6 MLLW - 0.0'-4.2' Intensely fractured pink grey granitic GNEISS becomes very intensely fractured at 1.75'	-36.6
40.8	8%	5' 3.2	5,5,6,5,7	Rock Core #3: -36.6 to -41.6 MLLW - Intensely fractured pink grey granitic GNEISS	-41.6
45.8	47%	5' 5'	no drill time recorded	Rock Core #4: -41.6 to -46.6 MLLW - 0.0'-2.5' Intensely fractured grey granitic GNEISS 2.5'-4.9' moderately fractured grey granitic GNEISS	-46.6

Comments: Seismic Boring #2 Location - Collapse of bedrock core after withdrawal of Rock Core #4, due to presence of highly fractured rock falling into hole. Elevation of collapse approximately -38.85 MLLW.

Refusal: -25.7 MLLW
Elevation of
Bedrock: -26.6 MLLW