Nobis Engineering
18 Chenell Drive
Concord, New Hampshire 03301

PROJECT
Remedial Design For Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

BORING NO. FD-101
SHEET 1 of 10
FILE NO. 48138.27
CHKD. BY J. Trottier

Boring Co.	Warren George, Inc.	Boring Location	northing 2697418	easting 814321	
Driller	S. Laurenza	Mudline El.	-8.37	Datum	NGVD
Logged By	S. Bonis	Date Start	1/8/2001	Date End	1/9/2001

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. center hole hammer free falling from a height of 30 inches.
Drill Rig: Failing Truck Rig
Drilling Method: 5-inch (PW) flush joint drill casing. 4-inch (HW) flush joint drill casing.
Casing driven with a 300 lb. Center hole hammer free falling from a height of 24 inches.

Groundwater Readings Not Applicable for Offshore Borings

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION (ASTM D2488)	STRATUM DESCRIPTION	REMKS
1	WOC								
2	WOC								
		S-1	24/24	2-4	WOR/24"	—	Sandy organic soil (OH); 60% organic clay/silt, 40% fine sand, organic odor, gray.		
							Shells noted.		
							Advance PW drill casing to 4 ft.		
3	WOC						Advance 3-7/8 in. roller bit to 4 ft.	ORGANIC CLAY	
4	12								
		S-2	24/18	4-6	WOR/24"	—	Similar to S-1.		
							Advance PW drill casing to 6 ft.		
5	7						Advance 3-7/8 in. roller bit to 6 ft.		
6	5								
		S-3	24/5	6-8	WOR/24"	—	Sandy organic soil (OH); 60% organic clay/silt, 40% fine sand, trace gravel, organic odor,		
	WOH						gray. Shells noted.		
							Advance PW drill casing to 8 ft.		
7	5						Advance 3-7/8 in. roller bit to 8 ft.		
8	8							8.0 ft.	
		S-4	24/12	8-10	2-4-3-4	7	Poorly graded sand (SP); loose, 75% fine sand, 20% medium sand,		
							5% silt, light gray to light brown.	MARINE SAND	
							Advance PW drill casing to 10 ft.		
9	15						Advance 3-7/8 in. roller bit to 10 ft.		
10	19						Perform falling head permeability test at 10 ft.		

GRANULAR SOILS (N-Values)	COHESIVE SOILS (N-Values)	SYMBOL KEY	
0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

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		S-5	24/12	10-12	5-2-4-5	6	**Silty sand (SM); 58% fine sand, 3% medium sand, 1% coarse sand, 1% gravel,**		1
							37% silt, grayish-brown.		
							Advance PW drill casing to 12 ft.		
11	23						Advance 3-7/8 in. roller bit to 12 ft.		
12	22								
		S-6	24/16	12-14	4-3-5-5	8	Poorly graded sand (SP); loose, 60% fine sand, 40% medium sand, brown. Iron staining noted		
							Advance PW drill casing to 14 ft.		
							Advance 3-7/8 in. roller bit to 14 ft.		
13	6								
14	10								
		S-7	24/11	14-16	3-1-1-5	2	Silty sand (SM); very loose, 75% fine sand, 10% medium sand, 15% silt, gray. Iron staining		
							noted.		
							Advance PW drill casing to 16 ft.		
15	WOH						Advance 3-7/8 in. roller bit to 16 ft.	MARINE	
								SAND	
16	13								
		S-8	24/6	16-18	3-1-4-6	5	**Silty sand (SM); 53% fine sand, 10% medium sand, 1% gravel, 36% silt, red and gray.**		1
							Brown interbedded silt lenses.		
							Advance PW drill casing to 18 ft.		
17	16						Advance 3-7/8 in. roller bit to 18 ft.		
18	25								
		S-9	24/6	18-20	5-3-5-7	8	**Silty sand with gravel (SM); 29% fine sand, 19% medium sand, 9% coarse sand, 15%**		1
							gravel, 28% silt, brown.		
							Interbedded silt lenses.		
19	24						Advance PW drill casing to 20 ft.		
							Advance 3-7/8 in. roller bit to 20 ft.		
20	27						Estimated strata change at 20 ft.	20.0 ft.	

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Logged By	S, Bonis	Date Start	1/8/2001 Date End 1/9/2001

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		S-10	24/14	20-22	4-4-3-7	7*	**Poorly graded sand with gravel (SP); 16% fine sand, 23% medium sand, 17%**		1,2
							coarse sand, 42% gravel, 2% silt, brown.		
							Subrounded to subangular sand and gravel.		
21	28						Advance PW drill casing to 22 ft.		
							Advance 3-7/8 in. roller bit to 22 ft.		
22	30								
		S-11	24/0"	22-24	4-6-6-6	12*	Washed sample.		2
							Advance PW drill casing to 27 ft.		
							Advance 3-7/8 in. roller bit to 27 ft.		
23	24						Mix bentonite drilling mud, specific gravity = 1.07.	GLACIO FLUVIAL	
24	31								
25	46								
26	43								
27	70								
		S-12	24/0"	27-29	15-4-3-3	7	Washed sample.		
							Advance PW drill casing to 32 ft.		
							Advance 3-7/8 in. roller bit to 32 ft.		
28	53								
29	57								
30	109								

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Logged By	S. Bonis	Date Start	1/8/2001 Date End 1/9/2001

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31	164							GLACIO FLUVIAL	
32	106							32.0 ft.	
							Top of bedrock at 32.0 ft.	BEDROCK	
							Advance 3-7/8 in. roller bit to 32.8 ft.		
							Telescope HW drill casing to 32.8 ft.		
33							Begin HQ rock core at 32.8 ft.		
							(boring log continued on next page)		
34									
35									
36									
37									
38									
39									
40									

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5 to 10 - Loose	3 to 4 - Soft
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31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	16 to 30 - Very Stiff
	Over 30 - Hard

SYMBOL KEY

1. S denotes split-barrel sampler.
2. U denotes 3-inch O.D. undisturbed sample.
3. UO denotes 3-inch Osterberg undisturbed sample.
4. PEN denotes penetration length of sampler.
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DEPTH (feet)	VISUAL REPRESENTATION	CORE INFORMATION: CORE RUN	CORE INTERVAL	CORE TIME	ROCK CORE DESCRIPTION	REMKS
		R1	32.8-33.8	5 min.	Begin R1 at 32.8 ft. Fresh, hard to very hard, fine to medium grained GNEISS. Low angle foliation (approx. 10 to 20 degrees). REC. = 100%; RQD = 100% (excellent). Water return color: milky white.	
33.3						
33.8			33.8-34.8	5.25 min.		
34.3						
34.8			34.8-35.8	7 min.		
35.3						
35.8			35.8-36.8	6 min.		
36.3						
36.8			36.8-37.8	6 min.		
37.3						
37.8					37.5 ft.: Mechanical break in rock core. End R1 at 37.8 ft.	

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31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
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DEPTH (feet)	VISUAL REPRESENTATION	CORE INFORMATION: CORE RUN	CORE INTERVAL	CORE TIME	ROCK CORE DESCRIPTION	REMKS
		R2	37.8-38.8	5.5 min	Begin R2 at 37.8 ft. Fresh, hard to very hard, fine to medium grained GNEISS. Low angle foliation (approx. 10 to 20 degrees). REC. = 100%; RQD = 100% (excellent). Water return color: milky white, except as noted.	
38.3						
38.8			38.8-39.8	5 min	38.9 ft.: Mechanical break in rock core.	
39.3						
39.8			39.8-40.8	6 min	39.4 to 40.5 ft.: Zone of red coloration, no change in grain size or texture noted. Water return color: pink to rusty. 39.8 and 40.1 ft.: Mechanical breaks in rock core.	
40.3						
40.8			40.8-41.8	6.5 min	40.8 and 40.9 ft.: Mechanical breaks in rock core. Core grinding noted.	
41.3					41.3 ft.: Mechanical break in rock core. Core grinding noted.	
41.8			41.8-42.8	6.25 min	41.9 ft.: Mechanical break in rock core.	
42.3					42.2 ft.: Mechanical break in rock core.	
42.8					End R2 at 42.8 ft.	

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DEPTH (feet)	VISUAL REPRESENTATION	CORE INFORMATION: CORE RUN	CORE INTERVAL	CORE TIME	ROCK CORE DESCRIPTION	REMKS
		R3	42.8-43.8	5.5 min.	Begin R3 at 42.8 ft. Fresh, hard to very hard, fine grained GNEISS. Low angle foliation (approx. 10 to 20 degrees). REC. = 100%; RQD = 100% (excellent). Water return color: milky white.	
43.3						
43.8			43.8-44.8	5.75 min.		
44.3						
44.8			44.8-45.8	5 min.		
45.3						
45.8			45.8-46.8	4.5 min.		
46.3						
46.8			46.8-47.8	6.75 min.		
47.3					47.1 ft.: Mechanical break in rock core.	
47.8					End R3 at 47.8 ft. Bottom of exploration at 47.8 ft. Boring terminated in bedrock. Grout completed borehole to mudline with cement/bentonite grout, specific gravity = 1.44.	

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ROCK CORE PICTURES

Core Runs R1 through R3

Core Runs R1 through R3

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Boring Co.	Warren George, Inc.	Boring Location	northing 2697418	easting 814321	
Driller	S. Laurenza	Mudline El.	-8.37	Datum	NGVD
Logged By	S. Bonis	Date Start	1/8/2001	Date End	1/9/2001

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. center hole hammer free falling from a height of 30 inches.
Drill Rig: Failing Truck Rig
Drilling Method: 5-inch (PW) flush joint drill casing. 4-inch (HW) flush joint drill casing.
Casing driven with a 300 lb. Center hole hammer free falling from a height of 24 inches.

Groundwater Readings Not Applicable for Offshore Borings

Date	Time	Depth	Elev.	Stabilization Time

ROCK CORE PICTURES

Core Runs R1 through R3

Reddish discoloration noted in R2

REMARKS:
1) Sample description based on laboratory classification. Refer to GeoTesting Express Report dated March 5, 2001. Laboratory description presented in bold.
2) *3-inch O.D. split-barrel sampler driven 24 inches with a 300 lb. center hole hammer free falling from a height of 24 inches.
3)
4)