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PHASE I REMEDIAL INVESTIGATION
NAVAL SUBMARINE BASE - NEW LONDON
GROTON, CONNECTICUT

APPENDICES

Prepared For:

NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
LESTER, PENNSYLVANIA

Prepared By:

ATLANTIC ENVIRONMENTAL SERVICES, INC.
COLCHESTER, CONNECTICUT

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ATLANTIC
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SOIL GAS DATA

TORPEDO SHOP

TORPEDO SHOP AREA – SOIL GAS ANALYSIS RESULTS									
SAMPLE ID	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG1	ND	----	----	----	ND	----	----	----	----
SG2	ND	----	----	----	ND	----	----	----	----
SG3	Low	2.9	Benzene	79.6	ND	----	----	----	2.9
SG4	ND	----	----	----	ND	----	----	----	----
SG5	Low	3.5	Benzene	78.9	ND	----	----	----	3.5
SG6	ND	----	----	----	ND	----	----	----	----
SG7	Low	2.1	Benzene	79.8	ND	----	----	----	2.1
SG8	Trace	1.2	Unknown	110.8	Benzene	77.9	Trace	0.742	1.94
SG9	ND	----	----	----	ND	----	----	----	----
SG10	Trace	0.761	Benzene	75.1	ND	----	----	----	0.761
SG11	ND	----	----	----	ND	----	----	----	----
SG12	ND	----	----	----	ND	----	----	----	----
SG13	ND	----	----	----	ND	----	----	----	----
SG14	Trace	2.0	Unknown	404.7	ND	----	----	----	2.0
SG15	Low	2.2	Unknown	408.0	Unknown	56.3	Trace	0.761	7.62
					Unknown	84.3	Trace	1.9	
					Unknown	109.8	Trace	1.8	
					Unknown	257.0	Trace	0.579	
					Unknown	336.0	Trace	0.375	
SG16	ND	----	----	----	ND	----	----	----	----
SG17	Trace	1.2	Unknown	623.8	ND	----	----	----	1.2
SG18	Trace	0.614	Toluene	174.2	ND	----	----	----	0.614
SG19	Trace	1.2	Unknown	48.9	Toluene	179.2	Trace	0.370	2.09
					PCE	252.8	Trace	0.521	
SG20	Low	3.1	DCE	44.7	Unknown	50.1	Low	2.2	10.46
					Unknown	58.9	Low	3.1	
					Unknown	88.9	Trace	0.363	
					Toluene	185.2	Trace	1.7	

TORPEDO SHOP AREA – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE ID	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG21	High	693.0	Unknown (Toluene may be masked within peak)	170.4	Unknown	69.7	Trace	1.0	704.3
					Benzene	77.3	Low	4.0	
					Unknown	114.4	Trace	1.4	
					Unknown	122.8	Low	2.9	
					Unknown	572.8	Trace	2.0	
SG22	ND	----	----	----	ND	----	----	----	----
SG23	Low	16.5	Unknown	144.9	Benzene	78.5	Trace	1.5	29.3
					Unknown	115.3	Trace	0.549	
					Unknown	124.0	Trace	1.7	
					Toluene	177.0	Low	3.2	
					Unknown	575.8	Trace	0.707	
					Unknown	707.9	Low	4.4	
					Unknown	776.6	Trace	0.772	
SG24	Low	4.3	Toluene	175.2	Benzene	78.5	Trace	1.3	6.7
					Unknown	132.4	Trace	1.1	
SG25	Low	4.8	Unknown	709.7	Benzene	79.6	Trace	0.622	9.22
					Unknown	136.0	Trace	0.796	
					Toluene	178.2	Low	3.0	
SG26	Low	5.0	Unknown	733.9	DCE	46.5	Low	4.1	14.5
					Benzene	78.7	Trace	0.523	
					Unknown	137.6	Trace	0.629	
					Toluene	177.2	Trace	0.946	
					Unknown	322.3	Low	3.3	
SG27	Trace	0.867	DCE	47.9	Unknown	137.6	Trace	0.544	3.57
					Toluene	173.7	Trace	0.637	
					Unknown	700.7	Trace	0.846	
					Unknown	770.6	Trace	0.677	
SG28	Trace	2.0	Toluene	179.2	Benzene	80.5	Trace	1.0	4.73
					Unknown	138.8	Trace	0.596	
					Unknown	706.1	Trace	0.465	
					Unknown	774.6	Trace	0.669	

NOTES:

1. Vs. is volt/seconds, which is an integrated area count of chromatographic peaks representing relative quantitation.
2. R.T. is retention time for specific compound in seconds.
3. Samples were classified by concentration using the following values:
   ND = < 0.3 Vs.; Trace = 0.3 - 2.0 Vs.; Low = 2.1 - 50 Vs.; Moderate = 50.1 - 300 Vs.; and High = > 300 Vs.

GOSS COVE LANDFILL

GOSS COVE LANDFILL – SOIL GAS ANALYSIS RESULTS									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG1	Low	6.5	PCE	259.8	Unknown	196.7	Trace	0.394	7.71
					Unknown	357.4	Trace	0.811	
SG2	Trace	1.5	Unknown	145.2	Unknown	54.5	Trace	0.774	4.25
					Benzene	78.9	Trace	0.436	
					Toluene	176.2	Trace	0.652	
					PCE	259.1	Trace	0.576	
					Unknown	359.2	Trace	0.308	
SG3	Trace	1.7	Toluene	176.2	Unknown	53.9	Trace	1.6	4.22
					Benzene	78.9	Trace	0.921	
SG4	Low	2.4	Benzene	79.1	Unknown	49.1	Trace	0.466	7.97
					Unknown	54.1	Trace	1.3	
					Unknown	59.9	Low	2.4	
					Toluene	176.7	Trace	1.4	
SG5	ND	----	----	----	ND	----	----	----	----
SG6	Trace	1.4	Unknown	54.7	Benzene	79.9	Trace	0.413	2.76
					Toluene	178.7	Trace	0.647	
					Unknown	361.2	Trace	0.304	
SG7	Trace	1.7	PCE	262.6	Unknown	59.1	Trace	0.359	2.06
SG8	Trace	1.4	Unknown	53.9	Benzene	80.2	Trace	0.467	2.74
					Toluene	181.7	Trace	0.555	
					Unknown	362.2	Trace	0.317	
SG9	Low	3.3	PCE	264.0	Unknown	53.5	Trace	0.985	4.69
					Unknown	363.2	Trace	0.413	
SG10	Trace	1.2	Unknown	53.7	ND	----	----	----	1.2
SG11	Trace	1.4	Toluene	177.2	Benzene	78.9	Trace	0.724	2.12
SG12	Low	4.2	Unknown	53.5	Benzene	79.3	Trace	1.0	6.88
					Toluene	177.7	Trace	1.0	
					Unknown	357.4	Trace	0.679	
SG13	Trace	1.1	Unknown	53.3	PCE	185.7	Trace	0.451	2.39
					Unknown	357.4	Trace	0.509	
					Unknown	741.5	Trace	0.330	
SG14	Trace	1.0	Unknown	54.1	Unknown	196.2	Trace	0.984	2.32
					Unknown	359.2	Trace	0.339	
SG15	Low	8.0	Unknown	212.4	DCE	48.5	Low	2.4	56.9
					Unknown	52.3	Low	3.9	
					Unknown	67.7	Trace	0.972	
					Benzene	78.8	Low	3.0	
					Unknown	131.6	Low	3.2	
					Unknown	158.8	Trace	0.306	
					Toluene	175.7	Low	3.6	
					Unknown	247.9	Low	2.6	
					PCE	266.1	Trace	1.7	
					Unknown	356.5	Low	8.0	

GOSS COVE LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG15 (continued)					Unknown	408.0	Low	3.1	
					Xylenes	438.8	Low	2.8	
					Unknown	516.1	Low	5.7	
					Xylenes	557.9	Low	3.9	
					Unknown	662.1	Low	3.8	
SG16	Low	13.3	DCE	51.3	Unknown	71.5	Trace	1.8	30.7
					Benzene	78.5	Low	6.8	
					Toluene	175.2	Low	8.0	
					Unknown	356.5	Trace	0.436	
					Xylenes	436.6	Trace	0.404	
SG17	Low	9.6	PCE	259.1	DCE	50.0	Low	12.5	46.12
					Benzene	78.7	Low	2.2	
					Unknown	89.8	Trace	0.756	
					TCE	102.4	Trace	0.482	
					Unknown	131.6	Low	2.9	
					Unknown	158.8	Trace	0.377	
					Toluene	174.7	Low	3.3	
					Unknown	211.8	Trace	2.0	
					Unknown	356.5	Low	7.6	
					Unknown	404.7	Trace	1.8	
					Xylenes	436.6	Trace	0.834	
					Unknown	514.8	Trace	0.471	
					Xylenes	555.1	Trace	0.413	
					Unknown	651.9	Trace	0.890	
SG18	Low	10.4	PCE	258.4	Benzene	78.7	Trace	1.7	17.99
					Unknown	136.4	Trace	0.789	
					Toluene	175.7	Low	5.1	
SG19	Low	5.6	PCE	267.5	Unknown	52.1	Low	3.5	14.45
					Benzene	84.1	Trace	0.352	
					Toluene	186.2	Low	5.0	
SG20	Low	6.9	Unknown	52.3	Unknown	71.1	Trace	1.1	15.36
					Benzene	78.3	Low	3.6	
					TCE	102.7	Trace	0.303	
					Unknown	140.4	Trace	0.559	
					Toluene	175.2	Low	2.9	
SG21	Trace	1.9	Unknown	54.7	DCE	48.7	Trace	0.479	3.6
					Benzene	77.9	Trace	0.335	
					Unknown	195.7	Trace	0.886	
SG22	ND	----	----	----	ND	----	----	----	
SG23	Low	6.3	Toluene	181.7	Unknown	49.6	Low	9.8	69.67
					Benzene	77.3	Low	2.5	
					Unknown	130.4	Trace	0.699	

GOSS COVE LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG23 (continued)					Unknown	139.6	Trace	0.590	
					Unknown	158.4	Trace	0.583	
					Unknown	210.6	Trace	6.1	
					Unknown	244.4	Trace	5.4	
					Unknown	352.9	Low	18.3	
					Unknown	398.2	Low	4.7	
					Unknown	510.9	Low	5.8	
					Xylenes	541.1	Low	5.2	
					Unknown	641.7	Low	3.7	
SG24	Low	8.3	Unknown	52.1	Unknown	70.5	Trace	1.0	19.13
					Benzene	77.9	Low	4.2	
					Unknown	138.0	Trace	0.551	
					Unknown	158.4	Trace	0.332	
					Toluene	173.7	Low	4.0	
					Unknown	352.0	Trace	0.382	
					Xylenes	431.0	Trace	0.368	
SG25	ND	----	----	----	ND	----	----	----	----
SG26	Low	18.3	Unknown	315.5	Unknown	64.1	Low	2.9	64.5
					Benzene	70.5	Low	9.2	
					Unknown	85.0	Low	3.6	
					TCE	92.2	Low	7.2	
					Unknown	117.1	Low	3.3	
					Unknown	187.7	Low	4.4	
					Unknown	219.6	Trace	1.9	
					PCE	232.2	Trace	1.3	
					Xylenes	455.6	Low	2.5	
					Unknown	494.0	Low	5.1	
					Unknown	580.0	Low	3.5	
					Unknown	702.5	Low	1.3	
SG27	Trace	0.888	Xylenes	459.2	Benzene	70.9	Trace	0.588	4.24
					Unknown	83.5	Trace	0.366	
					PCE	238.8	Trace	0.531	
					Xylenes	399.2	Trace	1.1	
					Unknown	733.9	Trace	0.763	
SG28	Low	2.1	Unknown	320.5	Unknown	44.1	Trace	1.4	9.40
					Unknown	48.5	Trace	2.0	
					Benzene	71.9	Trace	0.667	
					PCE	239.5	Trace	0.478	
					Unknown	368.2	Trace	1.2	
					Xylenes	388.2	Trace	1.1	
					Unknown	589.3	Trace	0.457	

GOSS COVE LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG29	ND	----	----	----	ND	----	----	----	----
SG30	Trace	1.1	TCE	93.4	Unknown	43.7	Trace	0.461	4.262
					Unknown	48.9	Trace	0.628	
					Unknown	52.5	Trace	0.505	
					Unknown	87.1	Trace	1.0	
					Unknown	102.4	Trace	0.568	
SG31	Low	3.0	Unknown	76.9	ND	----	----	----	3.0
SG32	Trace	0.776	Unknown	601.5	ND	----	----	----	0.776
SG33	ND	----	----	----	ND	----	----	----	----
SG34	Low	3.5	Unknown	73.5	Unknown	248.6	Trace	0.486	3.99
SG35	ND	----	----	----	ND	----	----	----	----
SG36	Low	15.0	Benzene	72.4	Unknown	45.1	Low	2.2	38.50
					Unknown	48.8	Low	9.1	
					Unknown	65.7	Low	2.6	
					TCE	94.6	Low	4.6	
					Unknown	323.2	Trace	1.3	
					Xylenes	395.2	Low	2.8	
					Xylenes	464.0	Trace	0.371	
					Unknown	601.5	Trace	0.527	
SG37	Trace	2.0	Unknown	48.7	Unknown	44.5	Trace	1.6	5.33
					Unknown	85.0	Trace	1.4	
					Unknown	325.0	Trace	0.332	
SG38	ND	---	---	---	ND	---	---	---	---
SG39	ND	---	---	---	ND	---	---	---	---
SG40	Low	7.6	Unknown	78.1	Unknown	48.5	Trace	1.5	19.9
					Unknown	53.3	Low	4.2	
					Benzene	70.3	Low	3.9	
					Unknown	102.4	Low	2.7	
SG41	Low	9.5	Unknown	78.5	Unknown	48.9	Trace	1.7	22.4
					Unknown	53.5	Low	5.5	
					Benzene	71.1	Low	2.2	
					Unknown	102.4	Low	3.5	
SG42	ND	---	---	---	ND	---	---	---	---
SG43	Low	6.8	Unknown	603.1	Unknown	47.7	Trace	1.7	37.4
					Unknown	78.5	Trace	1.8	
					Unknown	252.1	Trace	1.8	
					Unknown	336.7	Low	5.5	
					Xylenes	382.2	Low	3.3	
					Unknown	409.1	Low	4.2	
					Xyl nes	459.2	Low	6.3	
					Unknown	514.8	Low	6.0	
SG44	ND	---	---	---	ND	---	---	---	---

GOSS COVE LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG45	High	+300 (Offscale)	Unknown	approx 330	Unknown	47.3	Low	2.1	403.7
					Unknown	77.9	Low	3.3	
					Unknown	88.3	Trace	0.997	
					Unknown	130.8	Trace	0.659	
					Unknown	145.6	Low	3.6	
					Toluene	157.2	Low	3.1	
					Unknown	166.2	Low	2.6	
					Unknown	176.2	Low	3.9	
					Unknown	204.2	Low	31.8	
					Unknown	237.4	Moderate	51.6	
SG46	Low	31.2	Unknown	599.9	Unknown	78.1	Trace	0.539	94.12
					Unknown	169.7	Trace	0.641	
					Unknown	205.8	Trace	0.543	
					Unknown	249.3	Low	2.3	
					Unknown	334.9	Low	12.0	
					Xylenes	380.2	Low	15.7	
					Unknown	510.9	Low	31.2	
SG47	Low	7.0	Xylenes	400.3	Unknown	48.1	Low	2.9	49.13
					Unknown	51.9	Low	2.4	
					Unknown	56.7	Low	4.6	
					Benzene	69.5	Low	3.0	
					Unknown	77.5	Low	3.9	
					Unknown	88.0	Low	2.3	
					Unknown	168.2	Trace	1.1	
					Unknown	250.0	Trace	0.829	
					Unknown	333.0	Low	5.1	
					Unknown	379.2	Low	4.1	
					Xylenes	455.6	Low	4.5	
					Unknown	503.1	Low	4.9	
					Unknown	593.8	Low	2.5	
SG48	ND	----	----	----	ND	----	----	----	----
SG49	Trace	1.1	Toluene	131.6	Benzene	61.7	Trace	0.864	2.42
					TCE	80.8	Trace	0.451	
SG50	Low	3.4	Benzene	61.3	TCE	81.1	Low	3.0	7.33
					Toluene	132.0	Trace	0.933	
SG51	ND	----	----	----	ND	----	----	----	----
SG52	ND	----	----	----	ND	----	----	----	----
SG53	Trace	0.314	Toluene	134.8	ND	----	----	----	0.314
SG54	High	1300	Offscale (Unknown)	57.5	Unknown	113.5	Low	5.4	1317.5
					Toluene	131.6	Low	4.7	
					Unknown	153.9	Low	3.1	
					Unknown	210.0	Low	2.1	
					Unknown	289.1	Low	2.2	

GOSS COVE LANDFILL - SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG55	ND	----	----	----	ND	----	----	----	----
SG56	Trace	2.0	Toluene	137.2	Benzene	63.7	Trace	0.568	2.568
SG57	Trace	0.571	Toluene	134.8	Benzene	62.7	Trace	0.358	0.929
SG58	ND	----	----	----	ND	----	----	----	----
SG59	ND	----	----	----	ND	----	----	----	----
SG60	ND	----	----	----	ND	----	----	----	----
SG61	ND	----	----	----	ND	----	----	----	----
SG62	ND	----	----	----	ND	----	----	----	----
SG63	Trace	1.9	Toluene	134.9	Benzene	62.7	Trace	0.865	3.53
					Unknown	82.6	Trace	0.769	
SG64	Moderate	115.3	Unknown	812.9	Benzene	62.7	Trace	0.434	259.5
					Toluene	132.8	Trace	1.3	
					Unknown	155.2	Trace	0.350	
					PCE	192.2	Trace	1.5	
					Unknown	289.1	Low	14.3	
					Ethyl Benzene	331.3	Low	14.4	
					Unknown	424.5	Low	14.8	
					Unknown	464.8	Low	21.0	
					Unknown	545.5	Low	30.6	
					Unknown	615.9	Low	20.9	
					Unknown	665.5	Low	24.7	

NOTES:

1. Vs. is volt/seconds, which is an integrated area count of chromatographic peaks representing relative quantitation.
2. R.T. is retention time for specific compound in seconds.
3. Samples were classified by concentration using the following values: ND=<0.3 Vs.; Trace=0.3-2.0 Vs.; Low=2.1-50 Vs.; Moderate=50.1-300 Vs.; High=>300 Vs.

FORMER GASOLINE STATION

FORMER GASOLINE STATION - SOIL GAS ANALYSIS RESULTS									
SAMPLE ID	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG1	ND	----	----	----	ND	----	----	----	----
SG2	ND	----	----	----	ND	----	----	----	----
SG3	ND	----	----	----	ND	----	----	----	----
SG4	ND	----	----	----	ND	----	----	----	----
SG5	ND	----	----	----	ND	----	----	----	----
SG6	ND	----	----	----	ND	----	----	----	----
SG7	ND	----	----	----	ND	----	----	----	----
SG8	ND	----	----	----	ND	----	----	----	----
SG9	ND	----	----	----	ND	----	----	----	----
SG10	ND	----	----	----	ND	----	----	----	----
SG11	Low	21.8	Toluene	132.0	Unknown	55.1	Trace	0.657	70.3

NOTES:

1. Vs. is volt/seconds, which is an integrated area count of chromatographic peaks representing relative quantitation.
2. R.T. is retention time for specific compound in seconds.
3. Samples were classified by concentration using the following values:
   ND = < 0.3 Vs.; Trace = 0.3 - 2.0 Vs.; Low = 2.1 - 50 Vs.; Moderate = 50.1 - 300 Vs.; and High = > 300 Vs.
4. Clay sealer (Play-Doh) was found to create unwanted peaks on GC. All these samples were affected. Clay sealer replaced with natural clay for the rest of Navy Soil Gas. These results are still usable because the clay peaks did not interfere with the chromatogram areas of interest. This was the first time these peaks due to clay at the surface were ever noticed, probably due to the shallow sampling depth possible at the former gasoline station. (See report for details.)

AREA A LANDFILL

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG1	ND	----	----	----	ND	----	----	----	----
SG2	ND	----	----	----	ND	----	----	----	----
SG3	ND	----	----	----	ND	----	----	----	----
SG4	Trace	0.748	Benzene	79.1	ND	----	----	----	0.748
SG5	ND	----	----	----	ND	----	----	----	----
SG6	ND	----	----	----	ND	----	----	----	----
SG7	Trace	0.391	Benzene	80.5	ND	----	----	----	0.391
SG8	Trace	0.887	Benzene	80.2	ND	----	----	----	0.887
SG9	ND	----	----	----	ND	----	----	----	----
SG10	ND	----	----	----	ND	----	----	----	----
SG11	Trace	0.338	Benzene	79.9	ND	----	----	----	0.338
SG12	ND	----	----	----	ND	----	----	----	----
SG13	ND	----	----	----	ND	----	----	----	----
SG14	ND	----	----	----	ND	----	----	----	----
SG15	ND	----	----	----	ND	----	----	----	----
SG16	Low	6.4	Benzene	76.7	111-TCEa Toluene	69.5 168.7	Low Trace	2.1 1.4	9.9
SG17	ND	----	----	----	ND	----	----	----	----
SG18	ND	----	----	----	ND	----	----	----	----
SG19	ND	----	----	----	ND	----	----	----	----
SG20	ND	----	----	----	ND	----	----	----	----
SG21	ND	----	----	----	ND	----	----	----	----
SG22	ND	----	----	----	ND	----	----	----	----
SG23	ND	----	----	----	ND	----	----	----	----
SG24	Low	6.4	Unknown	53.1	111-TCEa Benzene TCE	70.3 77.3 101.2	Low Low Low	2.4 4.7 4.9	18.4
SG25	ND	----	----	----	ND	----	----	----	----
SG26	ND	----	----	----	ND	----	----	----	----
SG27	ND	----	----	----	ND	----	----	----	----
SG28	ND	----	----	----	ND	----	----	----	----
SG29	ND	----	----	----	ND	----	----	----	----
SG30	ND	----	----	----	ND	----	----	----	----
SG31	ND	----	----	----	ND	----	----	----	----
SG32	Trace	0.332	Benzene	79.9	ND	----	----	----	0.332
SG33	Low	2.7	Unknown	281.1	ND	----	----	----	2.7
SG34	ND	----	----	----	ND	----	----	----	----
SG35	ND	----	----	----	----	----	----	----	----
SG36	Low	33.5	Unknown	317.9	TCE	103.3	Trace	0.496	33.996
SG37	Trace	0.484	Benzene	78.7	ND	----	----	----	0.484
SG38	ND	----	----	----	ND	----	----	----	----

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG39	ND	----	----	----	ND	----	----	----	----
SG40	High	6700	Unknown	460.4	Unknown	76.3	Low	36.4	7621.5
					Unknown	156.4	Low	11.3	
					Unknown	135.9	Moderate	55.4	
					Unknown	651.6	Moderate	170	
					Toluene	233.5	High	557	
					Benzene	94.4	Moderate	79.5	
					TCE	113.4	Low	11.9	
SG41	ND	----	----	----	ND	----	----	----	----
SG42	Low	10.8	Benzene	74.7	Unknown	107.8	Low	7.8	22.3
					Toluene	163.7	Low	2.2	
					TCE	99.1	Trace	1.5	
SG43	Moderate	107	Unknown	328.3	Unknowns	126.0	Low	5.6	143.9
					Unknowns	199.2	Low	11.9	
					DCE	45.9	Low	4.4	
					Xylenes	403.6	Low	15	
SG44	ND	----	----	----	ND	----	----	----	----
SG45	Moderate	151.5	Benzene	75.4	Unknown	123.6	Low	4.7	160.4
					Unknown	137.6	Low	4.2	
SG46	High	536	Unknown	335.9	Unknown	214.6	High	298	1021.7
					Benzene	87.2	Moderate	97.8	
					Unknown	462.8	Low	34	
					DCE	50.3	Low	17.9	
					TCE	123.2	Low	24	
					Xylenes	401.4	Low	14	
SG47	ND	----	----	----	ND	----	----	----	
SG48	ND	----	----	----	ND	----	----	----	
SG49	High	1200	Unknown	64.5	Toluene	195.1	Low	32.9	1329.1
					Unknown	322.7	Low	38.6	
					Unknown	371.2	Low	14.4	
					Unknown	127.3	Low	43.2	
SG50	High	329.1	Unknown	384.8	Benzene	84.5	Moderate	78	574.1
					Unknown	320.2	Moderate	54.9	
					TCE	105.3	Low	9.7	
					Unknown	122.6	Low	26	
					Unknown	193.2	Low	37	
					Unknown	504.4	Low	39.4	
SG51	Low	9	DCE	46.6	Benzene	74.9	Trace	2.0	26.6
					Unknown	53.5	Low	5.5	
					Unknown	64.7	Low	3.1	
					Unknown	88.9	Low	2.7	
					Unknown	326.8	Low	4.3	

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG52	ND	----	----	----	ND	----	----	----	
SG53	Low	37.4	Unknown	84.5	TCE	94.3	Low	14.4	138.9
					Unknown	115.3	Low	12.7	
					Unknown	130.3	Low	13.0	
					Unknown	184.9	Low	36.5	
					Unknown	319.3	Low	24.9	
SG54	High	301	Unknown	318.7	approx. DCE	43.7	Low	8.4	483
					Benzene	75.7	Low	24	
					TCE	93.1	Low	9.6	
					Toluene	156.4	Low	5.0	
					approx. PCE	222.6	Low	30	
					Xylenes	397.2	Moderate	105	
SG55	Moderate	233.4	Unknown	478.8	Unknown	319.1	Moderate	132.8	676.9
					Unknown	83.5	Moderate	78.9	
					Unknown	580.4	Moderate	83.7	
					Unknown	102.4	Low	8.2	
					Unknown	119.3	Low	18.9	
					Unknown	132.4	Low	6.9	
					Unknown	145.2	Low	4.2	
					Unknown	189.0	Low	36.3	
					Unknown	366.2	Low	17.2	
					Toluene	155.5	Low	5.1	
					Xylenes	391.0	Moderate	51.3	
SG56	Low	11.5	Unknown	501.8	Unknown	52.7	Low	3.3	37.6
					Unknown	64.3	Low	2.4	
					Unknown	190.7	Low	1.5	
					Unknown	320.5	Low	6.5	
					Unknown	366.2	Low	3.4	
					approx. Benzene	77.3	Low	4.4	
					Xylenes	393.2	Low	4.6	
SG57	Moderate	78.3	Unknown	315.4	Xylenes	387.3	Moderate	56.8	182.3
					approx. Benzene	77.1	Low	26.4	
					approx. TCE	91.1	Low	7.6	
					Toluene	156.0	Low	3.0	
					approx. PCE	237.0	Low	10.2	
SG58	Low	15.0	TCE	94.2	Unknown	62.9	Low	5.2	45.1
					Unknown	76.9	Low	4.3	
					Unknown	83.5	Low	8.6	
					Unknown	120.8	Low	6.7	
					Unknown	135.2	Low	3.4	
					Unknown	145.6	Low	3.1	
					Unknown	191.7	Low	5.1	
					Toluene	156.0	Low	2.8	
					PCE	224.4	Trace	0.897	

AREA A LANDFILL - SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG59	High	300	approx. Xylenes	400.3	Unknown	46.3	Low	9.6	870.3
					Unknown	49.9	Low	9.0	
					Unknown	54.9	Low	22.2	
					Unknown	64.7	Low	9.6	
					Unknown	79.6	Low	15.0	
					Unknown	124.4	Low	8.4	
					Unknown	326.8	Moderate	61.8	
					Unknown	371.2	Moderate	54.0	
					Unknown	474.8	Moderate	140.4	
					Unknown	505.7	Moderate	115.8	
					Unknown	596.8	Moderate	78	
					Unknown	658.7	Low	37.8	
					approx. TCE	96.7	Trace	1.3	
					Toluene	156.8	Low	3.2	
					PCE	229.2	Low	4.2	
SG60	High	1000	Unknown	423.0	Unknown	63.1	Low	6.9	1239.9
					Unknown	86.8	Low	7.6	
					Unknown	105.4	Low	18.6	
					Unknown	122.2	Low	26.5	
					Unknown	193.7	Low	10.0	
					Unknown	325.0	Low	29.5	
					Unknown	500.8	Low	46.0	
					Unknown	595.3	Low	27.0	
					Unknown	663.8	Low	20.6	
					Unknown	720.6	Low	33.1	
					approx. Benzene	78.3	Low	5.9	
					approx. TCE	95.2	Low	4.1	
					Toluene	155.6	Trace	1.9	
					PCE	226.8	Trace	0.344	
SG61	Trace	1.2	Benzene	73.9	Unknown	84.1	Trace	0.632	
					Xylene	398.2	Trace	1.2	3.0
SG62	ND	----	----	----	ND	----	----	----	----
SG63	ND	----	----	----	ND	----	----	----	----
SG64	Trace	1.0	approx. TCE	99.1	Unknown	325.9	Trace	0.510	1.51
SG65	ND	----	----	----	ND	----	----	----	----
SG66	ND	----	----	----	ND	----	----	----	----
SG67	Moderate	50.9	Xylenes	400.1	Unknown	55.7	Low	3.8	227.0
					Unknown	122.1	Low	9.9	
					Unknown	196.7	Low	7.0	
					Unknown	247.9	Low	2.4	
					Unknown	328.6	Low	23.7	
					Unknown	374.2	Low	16.2	

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG67 continued					Unknown	477.2	Low	26.5	
					Unknown	514.8	Low	27.4	
					Unknown	607.9	Low	20.5	
					Unknown	667.2	Low	12.0	
					Unknown	733.9	Low	13.5	
					approx. Benzone	77.2	Low	8.0	
					approx. TCE	96.1	Trace	0.316	
					Toluene	156.1	Low	3.5	
					approx. PCE	231.0	Low	1.4	
SG68	High	1000	approx. Xylene	424.2	Unknown	86.2	Low	34.2	1720.3
					Unknown	107.2	Low	9.9	
					Unknown	125.7	Low	34.9	
					Unknown	144.8	Low	4.2	
					Unknown	155.7	Low	5.7	
					Unknown	198.7	Low	39.8	
					Unknown	251.4	Low	13.7	
					Unknown	329.2	Moderate	68.6	
					Unknown	513.5	Low	48.9	
					Unknown	609.5	Low	28.5	
					Unknown	674.0	Low	13.7	
					DCE	44.1	High	403.0	
					Toluene	164.2	Low	7.4	
					approx. PCE	234.0	Low	7.8	
SG69	ND	----	----	----	ND	----	----	----	----
SG70	Moderate	57.7	Unknown	332.5	Unknown	47.5	Low	3.7	176.8
					Unknown	52.1	Low	6.2	
					Unknown	67.3	Low	3.6	
					Unknown	80.9	Low	10	
					Unknown	126.8	Low	23.6	
					Unknown	145.2	Low	1.7	
					Unknown	156.8	Low	1.0	
					Unknown	167.2	Low	3.4	
					Unknown	201.3	Low	25.4	
					Unknown	235.8	Low	5.7	
					Unknown	252.1	Low	3.4	
					Unknown	381.2	Low	9.9	
					Unknown	419.0	Low	5.5	
					Unknown	482.3	Low	16.0	
SG71	High	971.2	Unknown	453.6	Unknown	63.1	Low	7.2	1604.5
					Unknown	86.6	Moderate	54.0	
					Unknown	127.1	Low	20.0	
					Unknown	194.3	Moderate	104.3	
					Unknown	228.1	Low	8.0	
					Unknown	328.1	Moderate	291.0	

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	
SG71 continued					Unknown	600.0	Moderate	81.6	
					Unknown	677.4	Low	21.6	
					Unknown	737.7	Low	37.4	
					approx. Toluene	155.8	Trace	1.0	
					approx. PCE	247.2	Low	7.2	
SG72	Low	2.1	Benzene	74.7	Xylene	406.9	Trace	1.3	3.4
SG73	High	>300	Unknown	----	Unknown	64.1	Low	5.9	
					Unknown	85.2	Moderate	79.9	575.3
					Unknown	105.6	Low	10.8	
					Unknown	126.7	Moderate	51.4	
					Unknown	195.4	Moderate	103.7	
					Toluene	156.1	Trace	1.3	
					approx. PCE	233.1	Low	20.2	
SG74	Low	6.8	Xylenes	404.7	Benzene	74.5	Low	2.3	
					Unknown	68.3	Trace	0.795	11.39
					Unknown	331.3	Trace	1.5	
SG75	Trace	1.3	Xylenes	404.7	Unknown	329.5	Trace	0.681	1.981
SG76	Low	8.3	Unknown	79.6	DCE	46.1	Trace	1.1	64.1
					Unknown	51.1	Trace	1.2	
					Unknown	55.9	Low	3.1	
					Unknown	64.9	Low	2.5	
					TCE	97.9	Low	2.2	
					Unknown	108.4	Low	2.3	
					Unknown	126.0	Low	4.4	
					Unknown	145.2	Low	2.9	
					Unknown	157.2	Trace	1.1	
					Unknown	200.4	Low	2.1	
					Unknown	336.7	Low	7.5	
					Unknown	382.6	Low	4.9	
					approx. Xylenes	419.0	Low	3.3	
					Unknown	479.7	Low	4.9	
					Unknown	527.1	Low	6.6	
					Unknown	615.9	Low	4.2	
					Unknown	684.5	Trace	1.5	
SG77	High	389.8	Xylenes	405.2	approx. DCE	51.1	Low	15.6	566.6
					Unknown	64.3	Low	6.4	
					Benzene	79.2	Low	21.4	
					Unknown	97.6	Low	3.6	
					Unknown	108.4	Low	5.0	
					Unknown	125.0	Low	9.6	
					Unknown	145.2	Low	4.9	
					Unknown	156.8	Low	4.0	
					Unknown	201.0	Low	17.6	
					Unknown	235.2	Low	5.3	

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG77 continued					PCE	251.4	Low	6.5	
					Unknown	336.7	Low	19.7	
					Unknown	483.6	Low	16.7	
					Unknown	521.5	Low	20.1	
					Unknown	617.5	Low	14.9	
					Unknown	682.5	Low	5.5	
SG78	Moderate	139.7	Xylenes	413.1	DCE	45.6	Low	3.1	219.4
					Unknown	49.9	Low	2.1	
					Unknown	54.4	Low	5.8	
					Unknown	65.5	Low	5.4	
					Benzene	78.3	Low	16.7	
					Unknown	97.3	Low	2.1	
					Unknown	108.7	Low	3.3	
					Unknown	126.4	Low	6.5	
					Unknown	145.2	Trace	1.3	
					Unknown	156.8	Trace	1.1	
					Unknown	201.6	Low	4.9	
					Unknown	336.7	Low	9.0	
					Unknown	527.1	Low	9.1	
					Unknown	619.1	Low	5.0	
					Unknown	688.1	Low	2.7	
					Unknown	747.2	Trace	1.6	
SG79	High	316.0	Unknown	439.8	Unknown	65.5	Low	5.9	804.8
					Benzene	79.0	Low	21.5	
					TCE	98.2	Low	2.6	
					Unknown	109.9	Low	7.3	
					Unknown	126.5	Low	10.9	
					Unknown	145.2	Low	2.2	
					Unknown	156.4	Low	3.9	
					Unknown	201.7	Low	32.8	
					Unknown	238.2	Low	6.6	
					Unknown	254.9	Low	6.5	
					Unknown	331.7	Moderate	262.6	
					Unknown	526.8	Moderate	61.9	
					Unknown	625.5	Low	33.3	
					Unknown	697.1	Low	30.8	
SG80	Low	4.2	Benzene	76.5	Unknown	46.7	Trace	2.0	16.4
						50.9	Low	3.8	
						67.1	Low	3.2	
						337.6	Trace	0.726	
						417.9	Low	2.1	
						623.9	Trace	0.393	

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG81	Low	13.1	Unknown	342.1	Unknown	48.5	Low	7.1	77.3
					Unknown	55.3	Low	5.8	
					Unknown	66.5	Low	5.1	
					Unknown	81.7	Low	6.8	
					Unknown	110.2	Trace	0.377	
					Unknown	128.4	Low	3.0	
					Unknown	145.2	Trace	1.3	
					Unknown	156.8	Trace	0.476	
					Unknown	205.2	Low	8.6	
					PCE	238.8	Low	2.4	
					Unknown	342.1	Low	13.1	
					Unknown	388.2	Low	5.9	
					Unknown	491.4	Low	4.4	
					Unknown	532.7	Low	4.1	
					Unknown	623.9	Low	2.2	
					Unknown	693.5	Trace	0.350	
SG82	High	6200	Unknown	439.1	Unknown	44.3	Moderate	248.3	7233.9
					Unknown	95.9	Moderate	113.8	
					Unknown	133.9	Moderate	69.9	
					Unknown	155.7	Low	9.3	
					Unknown	221.0	High	435.7	
					Unknown	618.3	Moderate	125.5	
					Unknown	695.3	Low	31.4	
SG83	Low	21.3	Benzene	78.2	Unknown	66.1	Low	4.9	50.4
						100.0	Low	3.8	
						108.7	Low	2.7	
						128.0	Low	6.0	
						145.2	Low	3.6	
						157.2	Trace	1.0	
						168.7	Low	3.4	
						205.8	Trace	1.6	
						340.3	Trace	1.6	
						419.0	Trace	0.477	
SG84	High	One large peak, unknown constituents, there was no duplicate run to separate peaks.							>300
SG85	Low	17.9	Xylenes	417.9	DCE	46.9	Trace	1.3	64.1
					Unknown	55.9	Low	5.8	
					Unknown	66.1	Trace	1.8	
					Benzene	76.5	Low	2.7	
					Unknown	87.4	Low	2.7	
					TCE	100.6	Low	2.1	
					Unknown	109.6	Trace	1.6	
					Unknown	127.6	Trace	1.4	
					Unknown	145.2	Low	2.2	

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG85 continued					Toluene	168.2	Low	11.6	
					Unknown	204.0	Low	2.6	
					Unknown	340.3	Low	2.5	
					Unknown	499.2	Low	6.9	
					Unknown	623.9	Trace	1.0	
SG86	High	5000	Unknown	443.2	Unknown	66.4	Low	9.4	5361.5
					Unknown	96.1	Moderate	158.4	
					Unknown	146.7	Moderate	59.6	
					Unknown	226.8	Moderate	105.3	
					Unknown	651.9	Low	28.8	
SG87	High	10300	Unknown	479.2	approx. DCE	48.8	Low	3.4	
					Unknown	52.2	Low	2.8	
					Unknown	57.7	Low	3.4	10655
					Unknown	70.3	Low	3.3	
					Unknown	82.5	Low	26.5	
					approx. TCE	104.8	Trace	0.907	
					Unknown	117.1	Low	2.8	
					Unknown	135.1	Low	31.6	
					Unknown	156.8	Low	2.1	
					Unknown	182.2	Low	6.9	
					Unknown	220.5	Moderate	94.4	
					Unknown	260.5	Low	15.1	
					Unknown	279.0	Low	38.0	
					Unknown	698.6	Moderate	123.4	
SG88	High	6600	Unknown	488.7	Unknown	49.5	Trace	2.0	6904.6
					Unknown	56.8	Low	10.6	
					Unknown	71.5	Low	2.9	
					Unknown	88.3	Low	7.4	
					Unknown	108.4	Trace	1.3	
					Unknown	121.2	Trace	1.8	
					Unknown	139.5	Low	23.4	
					Unknown	157.2	Low	3.0	
					Unknown	190.6	Moderate	76.4	
					Unknown	226.8	Moderate	55.1	
					Unknown	279.9	Moderate	120.7	
SG89	High	858.1	Unknown	452.9	Unknown	52.1	Low	18.5	1075
					Unknown	138.1	Low	18.5	
					Unknown	186.7	Low	13.0	
					Unknown	225.4	Low	34.6	
					Unknown	289.1	Low	13.5	
					Unknown	379.2	Low	34.4	
					Unknown	555.1	Low	28.4	
					Unknown	590.8	Low	22.9	
					Unknown	698.9	Low	33.1	

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG90	Moderate	96.6	Xylenes	406.1	approx. DCE	43.4	Moderate	187.5	581.2
					Unknown	83.2	Low	26.1	
					approx. TCE	96.4	Low	3.5	
					Unknown	106.6	Low	10.4	
					Unknown	124.1	Low	24.2	
					Unknown	197.1	Low	38.1	
					PCE	248.6	Low	6.8	
					Unknown	326.6	Moderate	65.5	
					Unknown	474.7	Low	47.7	
					Unknown	516.6	Moderate	50.7	
					Unknown	612.7	Low	24.4	
SG91	High	3100	Unknown	378.6	approx. DCE	43.9	High	341.7	3756.2
					Unknown	87.2	moderate	61.8	
					Unknown	109.5	Low	10.1	
					Unknown	127.9	Low	24.7	
					Toluene	170.2	Low	11.1	
					Unknown	202.2	Moderate	59.6	
					Unknown	240.9	Low	6.5	
					Unknown	260.5	Low	15.5	
					Unknown	497.7	Moderate	51.3	
					Unknown	535.5	Low	32.8	
					Unknown	641.7	Low	41.1	
SG92	Moderate	239.7	Unknown	519.0	Unknown	84.8	Low	32.2	560.3
					TCE	99.7	Low	4.5	
					Unknown	110.1	Low	13.2	
					Unknown	127.3	Low	14.2	
					Toluene	169.7	Trace	0.536	
					Unknown	204.1	Low	19.5	
					PCE	241.6	Trace	0.485	
					Unknown	339.4	Low	38.2	
					Unknown	394.2	Low	14.1	
					Xylenes	418.7	Moderate	57.3	
					Unknown	627.4	Moderate	109.6	
					Unknown	709.7	Low	16.8	
SG93	Trace	1.1	DCE	48.5	Benzene	75.9	Trace	0.624	2.2
					Toluene	171.7	Trace	0.485	
SG94	Trace	0.712	Unknown	85.6	Unknown	53.1	Trace	0.457	1.9
					Unknown	145.2	Trace	0.694	

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)

SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG95	Low	36.6	Benzene	79.4	Unknown	63.7	Low	5.8	101
					TCE	96	Low	9.3	
					Unknown	124	Low	5.3	
					Unknown	137.2	Low	2.5	
					Unknown	145.2	Trace	2.0	
					Unknown	157.2	Low	3.3	
					Toluene	175.2	Trace	1.2	
					Unknown	200.4	Low	11.7	
					Unknown	235.8	Low	4.8	
					Unknown	342.1	Low	9.7	
					Unknown	390.2	Low	2.9	
					Unknown	496.6	Low	2.2	
					Unknown	538.3	Low	2.2	
					Unknown	631.9	Trace	1.5	
SG96	Trace	1.6	Toluene	167.7	DCE	45.7	Trace	1.0	
					Benzene	74.1	Trace	0.602	3.8
					Unknown	145.2	Trace	0.560	
SG97	Trace	0.888	DCE	46.3	Unknown	145.2	Trace	0.441	1.3
SG98	Trace	1.8	Unkown	180.7	DCE	42.3	Trace	1.2	6.2
					Unknown	50.9	Trace	0.799	
					approx. Benzene	81.4	Trace	0.707	
					Unknown	144.8	Trace	1.4	
					Unknown	158.8	Trace	0.338	
SG99	Low	3.9	DCE	42.9	Unknown	51.5	Low	4.7	13.7
					Unknown	82.6	Trace	0.541	
					Unknown	182.7	Trace	0.684	
					Unknown	217.2	Trace	0.769	
					Unknown	358.3	Low	1.7	
					Unknown	513.5	Trace	0.650	
					Unknown	646.8	Trace	0.777	
SG100	Low	5.7	DCE	46.5	Benzene	75.3	Trace	2.0	14.5
					Unknown	131.2	Trace	0.707	
					Unknown	145.2	Trace	0.801	
					Toluene	166.2	Low	4.7	
					Unknown	492.7	Trace	0.561	
SG101	Trace	0.951	DCE	46.1	Benzene	73.9	Trace	0.802	2.24
					Unknown	145.2	Trace	0.488	
SG102	Trace	0.947	Toluene	158.0	Unknown	127.6	Trace	0.366	1.9
					Unknown	422.3	Trace	0.591	

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG103	Low	24.6	Unknown	541.1	DCE	45	Trace	1.6	171.3
					Benzene	75.5	Low	10.5	
					TCE	96.4	Trace	0.311	
					Unknown	124.4	Low	4.2	
					Toluene	158.4	Trace	1.8	
					Unknown	200.4	Low	6.2	
					PCE	236.4	Low	1.3	
					Unknown	341.2	Low	19.0	
					Unknown	391.2	Low	10.8	
					Xylenes	423.4	Low	15.1	
					Unknown	499.2	Low	20.1	
					Unknown	541.1	Low	24.6	
					Unknown	635.1	Low	22.2	
					Unknown	704.3	Low	9.0	
SG104	Low	6.7	Unknown	247.9	DEC	45.7	Trace	0.605	8.05
					Unknown	145.2	Trace	0.746	
SG105	Moderate	148.0	Unknown	328.7	approx. DCE	49.0	Low	15.9	336.9
					Benzene	75.7	Low	14.5	
					TCE	96.1	Low	2.4	
					Unknown	122.1	Low	13.9	
					Toluene	157.6	Low	3.7	
					Unknown	198.3	Low	25.5	
					Unknown	235.8	Low	5.0	
					approx. PCE	252.8	Low	3.8	
					Unknown	389.2	Low	12.8	
					Xylenes	416.9	Moderate	56.9	
					Unknown	496.6	Low	11.8	
					Unknown	539.7	Low	14.1	
					Unknown	635.1	Low	8.6	
SG106	High	709.2	Xylenes	432.0	Unknown	64.3	Low	4.6	929.1
					Benzene	77.3	Low	23.6	
					TCE	96.7	Low	3.1	
					Unknown	106.9	Low	5.1	
					Unknown	122.8	Low	16.2	
					Toluene	157.6	Low	7.5	
					Unknown	199.4	Low	32.1	
					Unknown	237.0	Low	6.6	
					Unknown	254.9	Low	7.7	
					Unknown	338.7	Moderate	51.8	
					Unknown	539.7	Low	29.2	
					Unknown	641.7	Low	32.4	

AREA A LANDFILL - SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG107	Low	20.6	Xylenes	420.1	approx. DCE	48.7	Low	5.4	43.1
					Benzene	74.9	Low	2.2	
					Unknown	124.8	Low	3.0	
					Unknown	145.2	Low	2.1	
					Toluene	158	Trace	1.5	
					Unknown	200.4	Low	2.2	
					Unknown	339.4	Low	6.1	
SG108	high	322.1	Unknown	505.7	Unknown	53.6	Low	18.9	715.9
					Benzene	78.1	Low	3.3	
					TCE	100.6	Low	2.3	
					Toluene	170.7	Trace	1.6	
					Unknown	204.8	Low	30.9	
					Unknown	240.9	Low	10.4	
					Unknown	343.9	Moderate	153.9	
					Xylenes	406.4	Moderate	105.7	
					Unknown	623.1	Low	45.8	
					Unknown	700.7	Low	21.0	
SG109	Low	5.0	DCE	46.7	Benzene	77.1	Trace	0.698	5.698
SG110	Low	2.6	DCE	47.3	Unknown	136.8	Trace	0.476	3.076
SG111	Trace	0.943	Benzene	78.3	Unknown	136	Trace	0.490	1.433
SG112	Low	5.3	Unknown	351.1	DCE	48.5	Trace	0.686	30.9
					Unknown	57.5	Trace	0.626	
					Unknown	68.3	Trace	0.303	
					Benzene	84.4	Trace	1.1	
					TCE	102.1	Trace	1.1	
					Unknown	132.8	Low	4.8	
					Unknown	145.2	Trace	0.903	
					Unknown	210.6	Trace	1.6	
					Unknown	398.2	Trace	2.0	
					Xylenes	427.8	Low	5.1	
					Unknown	510.9	Low	3.2	
					Unknown	543.9	Low	2.6	
					Unknown	641.7	Trace	1.6	
SG113	Trace	0.627	Unknown	732.6	DCE	47.7	Trace	0.358	0.985
SG114	Low	3.7	DCE	48.5	Benzene	79.9	Trace	1.9	6.273
					Unknown	137.6	Trace	0.358	
					Unknown	158.0	Trace	0.315	

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG115	Low	29.1	Unknown	546.7	approx. DCE	49.3	Low	13.4	223
					Unknown	56.2	Low	4.7	
					Benzene	83.8	Low	2.7	
					TCE	101.5	Low	2.1	
					Unknown	130.8	Low	6.9	
					Toluene	172.7	Low	7.9	
					Unknown	210	Low	19.4	
					PCE	245.8	Low	9.9	
					Unknown	350.2	Low	31.0	
					Unknown	399.2	Low	11.3	
					Xylenes	430	Low	25.3	
					Unknown	504.4	Low	27.8	
					Unknown	643.4	Low	24.3	
					Unknown	711.5	Low	7.2	
SG116	Low	9.7	Toluene	175.2	Unknown	51.5	Low	6.1	24.6
					Unknown	71.7	Low	1.7	
					Benzene	79.3	Low	4.8	
					TCE	103.6	Trace	0.315	
					Unknown	135.2	Trace	0.493	
					Unknown	145.6	Trace	0.357	
					Unknown	352	Trace	0.413	
					Unknown	645.1	Trace	0.750	
SG117	Trace	1.8	DCE	46.1	Unknown	137.2	Trace	0.373	3.9
					Unknown	161.7	Trace	1.7	
SG118	Trace	0.657	Benzene	79.3	Unknown	136	Trace	0.418	1.08
SG119	Trace	0.551	Unknown	134.4	Benzene	78.1	Trace	0.323	1.4
					Unknown	134.4	Trace	0.551	
SG120	Low	8.2	Unknown	350.2	DCE	48.3	Low	2.9	56.3
					Benzene	78.7	Trace	0.376	
					Unknown	131.2	Trace	1.3	
					Unknown	145.2	Trace	0.420	
					Toluene	173.7	Low	7.5	
					Unknown	210	Trace	1.2	
					Unknown	350.2	Low	8.2	
					Unknown	398.2	Low	3.5	
					Xylenes	428.9	Low	5.7	
					Unknown	505.7	Low	7.6	
					Unknown	545.3	Low	4.7	
					Unknown	650.2	Low	4.7	
SG121	Moderate	141.5	Unknown	453.2	Unknown	51	Low	8.7	277
					Unknown	87.7	Low	4.2	
					Unknown	145.6	Low	2.5	
					Unknown	191.2	Low	10.3	
					Unknown	373.2	Low	8.2	

AREA A LANDFILL – SOIL GAS ANLAYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG121 continued					Xylenes	421.2	Low	16.8	
					Unknown	535.9	Moderate	82.0	
					Unknown	675.7	Low	2.8	
SG122	Low	2.9	Unknown	41.1	approx. DCE	50.7	Low	2.7	13.7
					Benzene	79.6	Trace	0.445	
					Unknown	145.2	Trace	1.2	
					Toluene	177.2	Trace	1.2	
					Unknown	352.9	Trace	1.3	
					Unknown	401.4	Trace	1.5	
					Unknown	432.2	Trace	1.7	
					Unknown	651.9	Trace	0.706	
SG123	Trace	0.855	approx. DCE	48.3	Unknown	138.8	Trace	0.355	1.85
					Unknown	145.2	Trace	0.316	
					Unknown	158.4	Trace	0.323	
SG124	Low	2.4	Unknown	50.7	Benzene	78.7	Trace	0.799	3.2
SG125	Trace	0.815	Unknown	48.1	ND	----	----	----	----
SG126	----	----	ND	----	ND	----	----	----	
SG127	Low	2.5	Unknown	49.0	Benzene	78.9	Trace	0.442	2.94
SG128	Low	2.9	Unknown	50.3	Benzene	78.5	Trace	0.657	3.55
SG129	Low	4.9	Unknown	52.1	Benzene	76.5	Trace	1.3	13.1
					Toluene	170.7	Trace	1.4	
					Unknown	341.2	low	2.8	
					Unknown	387.2	Trace	0.916	
					Xylenes	416.8	Trace	1.8	
SG130	Low	2.2	Xylenes	420.1	Unknown	48.3	Trace	1.1	7.5
					Unknown	52.3	Low	2.1	
					Unknown	70.3	Trace	0.367	
					approx. Benzene	77.3	Trace	1.4	
					Unknown	344.8	Trace	0.366	
SG131	Trace	1.3	approx. Benzene	78.1	Unknown	344.8	Trace	0.670	2.83
					Xylenes	417.9	Trace	0.863	
SG132	Trace	1.1	Unknown	345.7	ND	----	----	----	1.1
SG133	Trace	1.3	Unknown	345.7	Unknown	48.1	Trace	1.2	3.7
					Benzene	78.3	Trace	445.8	
					Unknown	421.2	Trace	0.779	
SG134	Trace	1.3	Unknown	343.9	Unknown	50.7	Trace	1.0	3.3
					Unknown	419	Trace	1.0	
SG135	Low	2.7	Xylenes	417.9	Unknown	50.9	Trace	1.8	8.03
					Benzene	77.5	Trace	0.574	
					Unknown	111.1	Trace	0.654	
					Unknown	343	Low	2.3	

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG136	Trace	1.0	Unknown	342.1	Unknown	181.2	Trace	0.353	2.206
					Xylenes	416.8	Trace	0.853	
SG137	Low	6.2	Unknown	51.9	Unknown	70.1	Trace	1.4	12.5
					Benzene	77.5	Low	2.8	
					Unknown	343	Trace	1.1	
					Xylenes	416.8	Trace	1.6	
SG138	Low	2.3	Benzene	77.9	Unknown	51.9	Trace	1.3	5.75
					Unknown	344.8	Trace	0.951	
					Xylenes	419	Trace	1.2	
SG139	Low	3.3	Benzene	76.1	Unknown	51.5	Low	2.8	10.61
					Unknown	67.3	Low	2.1	
					Toluene	166.2	Trace	0.605	
					Unknown	335.8	Trace	1.8	
SG140	Trace	1.9	Unknown	52.1	Unknown	47.5	Trace	0.986	5.15
					Unknown	62.1	Trace	0.609	
					Benzene	76.3	Trace	1.2	
					Toluene	166.7	Trace	0.451	
SG141	Trace	2.0	Benzene	76.1	Toluene	166.2	Trace	1.3	4.15
					Unknown	332.2	Trace	0.845	
SG142	ND	----	----	----	ND	----	----	----	----
SG143	Trace	1.3	Benzene	74.9	Unknown	67.1	Trace	0.344	2.37
					Toluene	158.4	Trace	0.724	
SG144	ND	----	----	----	ND	----	----	----	----
SG145	ND	----	----	----	ND	----	----	----	----
SG146	Trace	2.0	Unknown	50.1	Unknown	56.7	Trace	1.2	4.74
					Unknown	72.9	Trace	0.990	
					Unknown	552.3	Trace	0.550	
SG147	----	----	ND	----	ND	----	----	----	----
SG148	----	----	ND	----	ND	----	----	----	----
SG149	----	----	ND	----	ND	----	----	----	----
SG150	----	----	ND	----	ND	----	----	----	----
SG151	Moderate	61.1	approx. Toluene	158.9	approx. DCE	46.9	Low	12.8	177.3
					Unknown	65.9	Low	4.3	
					approx. Benzene	80.3	Low	49.1	
					TCE	97.0	Low	15.2	
					Unknown	122.0	Low	2.1	
					Unknown	136.4	Low	5.6	
					Unknown	211.2	Low	5.1	
					Unknown	335.8	Trace	1.5	
					Unknown	395.2	Low	10.1	
					Unknown	470.0	Low	8.6	
					Unknown	586.3	Trace	0.896	
					Unknown	688.9	Trace	0.878	

AREA A LANDFILL – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG152	Low	5.1	Xylenes	401.4	approx. DCE	47.1	Trace	1.4	21.3
					Unknown	50.9	Low	3.5	
					Unknown	59.3	Low	2.3	
					Unknown	67.9	Low	2.3	
					Benzene	75.1	Low	4.5	
					Toluene	162.7	Trace	1.2	
					Unknown	474.8	Trace	1.0	
SG153	Low	3.6	Xylenes	406.9	Benzene	75.7	Trace	0.651	6.38
					Toluene	165.2	Trace	0.724	
					Unknown	486.2	Trace	1.4	
SG154	Trace	1.9	Benzene	70.7	ND	----	----	----	1.9
SG155	Low	2.4	Benzene	70.3	ND	----	----	----	2.4
SG156	Moderate	100	Unknown	>600	approx. DCE	40.6	Low	5.5	110.3
					Unknown	49.5	Low	4.1	
					~ TCE	91.3	Trace	0.309	
					Unknown	305.1	Trace	0.398	
SG157	Trace	1.0	Unknown	689	Benzene	70.3	Trace	0.879	2.41
					unknown	307.5	Trace	0.532	
SG158	Low	2.3	Benzene	71.3	ND	----	----	----	2.3
SG159	Trace	1.9	Unknown	48.3	Benzene	70.9	Trace	1.4	3.98
					Unknown	307.5	Trace	0.679	
SG160	Low	12.8	TCE	92.3	DCE	41.6	Low	10.1	34.05
					Unknown	50	Low	7.7	
					Benzene	71.5	Trace	0.987	
					PCE	226.2	Trace	1.3	
					Unknown	379.2	Trace	0.629	
					Unknown	691.7	Trace	0.535	

NOTES:

1. Vs. is volt/seconds, which is an integrated area count of chromatographic peaks representing relative quantitation.
2. R.T. is retention time for specific compound in seconds.
3. Samples were classified by concentration using the following values: ND=<0.3 Vs.; Trace=0.3-2.0 Vs.; Low=2.1-50 Vs.; Moderate=50.1-300 Vs.; and High=>300 Vs.

DEFENSE REUTILIZATION AND MARKETING OFFICE (DRMO)

DRMO - SOIL GAS ANALYSIS RESULTS									
SAMPLE ID	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG1	Low	2.5	Benzene	78.3	Unknown	70.5	Trace	0.871	6.252
					Toluene	172.7	Trace	0.781	
					PCE	252.8	Low	2.1	
SG2	Moderate	70.2	TCE	104.1	DCE	45.1	Low	2.5	87.6
					Unknown	54.5	Low	11.4	
					PCE	254.2	Low	3.5	
SG3	Low	4.9	TCE	101.8	Unknown	54.5	Low	2.1	9.933
					Benzene	78.1	Trace	1.7	
					Toluene	172.7	Trace	0.475	
					PCE	252.8	Trace	0.758	
SG4	Trace	2.0	Benzene	78.1	Toluene	170.7	Trace	1.7	3.7
SG5	ND	----	----	----	ND	----	----	----	----
SG6	Trace	0.332	Toluene	138.8	ND	----	----	----	0.332
SG7	ND	----	----	----	ND	----	----	----	----
SG8	Trace	1.1	TCE	87.1	Unknown	33.3	Trace	0.663	3.403
					Benzene	66.8	Trace	0.816	
					PCE	218.0	Trace	0.823	
SG9	Trace	0.838	TCE	87.1	Benzene	66.6	Trace	0.332	1.17
SG10	Low	2.7	DCE	45.9	Benzene	66.1	Trace	0.617	6.476
					TCE	86.2	Trace	0.935	
					Unknown	488.8	Trace	1.4	
					Unknown	578.8	Trace	0.822	
SG11	ND	----	----	----	ND	----	----	----	----
SG12	Trace	0.641	Benzene	66.3	Toluene	146.8	Trace	0.418	1.059
SG13	Low	6.1	TCE	86.2	Benzene	65.9	Trace	0.331	6.431
SG14	Low	24.5	PCE	220.8	Unknown (Probably has DCE masked in peak)	50.9	Low	22.0	63.1
					TCE	86.4	Low	16.6	----
SG15	Trace	0.385	Benzene	66.7	ND	----	----	----	0.385
SG16	ND	----	----	----	ND	----	----	----	----
SG17	ND	----	----	----	ND	----	----	----	----
SG18	Trace	0.313	Benzene	67.1	ND	----	----	----	0.313
SG19	ND	----	----	----	ND	----	----	----	----
SG20	Trace	1.8	TCE	88.0	ND	----	----	----	1.8
SG21	Low	16.6	TCE	86.5	Benzene	66.7	Trace	2.0	19.6
					PCE	220.8	Trace	1.0	
SG22	Low	29.2	TCE	87.6	DCE	38.0	Low	3.6	48.5
					Unknown	48.7	Low	14.6	
					PCE	220.8	Trace	1.1	

DRMO - SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG23	High	533.5	Unknown (Benzene probably masked in peak)	53.3	Unknown	110.2	Low	8.8	755.68
					Toluene	133.6	Low	22.0	
					Unknown	154.8	Low	3.8	
					Unknown	167.2	Low	10.3	
					Unknown	208.4	Low	13.4	
					Unknown	261.8	Trace	0.782	
					Unknown	310.7	Low	48.2	
					Unknown	488.8	Low	41.4	
					Unknown	581.8	Low	37.0	
					Unknown	709.7	Low	23.2	
					Unknown	798.6	Low	13.3	
SG24	Low	2.3	TCE	85.6	Benzene	60.9	Trace	0.580	3.260
					Toluene	131.2	Trace	0.380	
SG25	Low	2.9	TCE	80.5	ND	----	----	----	2.9
SG26	Low	2.4	TCE	83.5	ND	----	----	----	2.4
SG27	Trace	1.6	Unknown	905.7	TCE	80.8	Trace	1.0	3.0
					Toluene	133.6	Trace	0.435	
SG28	Moderate	83.5	TCE	87.0	Benzene	65.7	Trace	2.0	85.907
					Toluene	133.6	Trace	0.407	
SG29	Low	3.8	TCE	81.1	ND	----	----	----	3.8
SG30	ND	----	----	----	ND	----	----	----	----
SG31	ND	----	----	----	ND	----	----	----	----
SG32	Low	2.4	Benzene	64.3	Toluene	136.4	Trace	0.863	5.199
					Unknown	650.2	Trace	1.0	
					Unknown	709.7	Trace	0.936	
SG33	Trace	1.7	Unknown	648.5	Benzene	63.9	Trace	1.2	5.493
					Toluene	135.2	Trace	0.483	
					Unknown	482.3	Trace	0.386	
					Unknown	532.7	Trace	0.323	
					Unknown	708.7	Trace	1.4	
SG34	Low	3.1	Benzene	63.5	Toluene	135.8	Trace	0.830	7.820
					PCE	205.2	Trace	0.666	
					Unknown	482.3	Trace	0.723	
					Unknown	646.8	Trace	1.2	
					Unknown	713.3	Trace	1.3	
SG35	ND	----	----	----	ND	----	----	----	----
SG36	ND	----	----	----	ND	----	----	----	----
SG37	Trace	0.664	Toluene	136.8	Unknown	57.9	Trace	0.364	1.511
					TCE	83.5	Trace	0.482	----
SG38	Trace	1.2	TCE	83.2	ND	----	----	----	1.2
SG39	ND	----	----	----	ND	----	----	----	----

DRMO - SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE ID	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG40	ND	----	----	----	ND	----	----	----	----
SG41	ND	----	----	----	ND	----	----	----	----
SG42	ND	----	----	----	ND	----	----	----	----
SG43	ND	----	----	----	ND	----	----	----	----
SG44	ND	----	----	----	ND	----	----	----	----
SG45	ND	----	----	----	ND	----	----	----	----
SG46	ND	----	----	----	ND	----	----	----	----
SG47	ND	----	----	----	ND	----	----	----	----
SG48	ND	----	----	----	ND	----	----	----	----
SG49	ND	----	----	----	ND	----	----	----	----
SG50	ND	----	----	----	ND	----	----	----	----
SG51	ND	----	----	----	ND	----	----	----	----
SG52	ND	----	----	----	ND	----	----	----	----
SG53	ND	----	----	----	ND	----	----	----	----

NOTES:

1. Vs. is volt/seconds, which is an integrated area count of chromatographic peaks representing relative quantitation.
2. R.T. is retention time for specific compound in seconds.
3. Samples were classified by concentration using the following values: ND=<0.3 Vs.; Trace=0.3-2.0 Vs.; Low=2.1-50 Vs.; Moderate=50.1 Vs.-300 Vs.; High=> 300 Vs.
4. Samples SG41 through SG51 appear to have been taken with a partially blocked syringe (possible false negatives).

LOWER SUBASE

LOWER BASE – SOIL GAS ANALYSIS RESULTS									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG1	ND	----	----	----	ND	----	----	----	0.358
SG2	Trace	0.358	Benzene	63.7	ND	----	----	----	----
SG3	ND	----	----	----	ND	----	----	----	563.2
SG4	High	427	Unknown (Benzene most likely masked in peak)	85.9	Unknown	48.9	Moderate	71.1	
					Unknown	118.7	Low	12.0	
					Toluene	137.7	Low	28.7	
					Unknown	152.7	Low	11.1	
					Unknown	167.7	Low	9.5	
					Unknown	219.0	Low	3.8	
SG5	Low	2.1	Unknown	53.1	Benzene	65.1	Trace	1.7	3.8
SG6	ND	----	----	----	ND	----	----	----	----
SG7	Trace	1.9	Benzene	66.3	ND	----	----	----	1.9
SG8	ND	----	----	----	ND	----	----	----	----
SG9	Low	3.3	Toluene	140.0	Unknown	70.9	Trace	0.335	6.36
					Unknown	302.7	Trace	0.935	
					Xylenes	375.2	Trace	0.457	
					Xylenes	450.8	Trace	0.715	
					Unknown	487.5	Trace	0.621	
SG10	ND	----	----	----	ND	----	----	----	----
SG11	Low	4.0	Unknown	298.7	Unknown	84.1	Trace	1.6	9.57
					Toluene	138.8	Trace	0.746	
					Unknown	218.4	Trace	0.710	
					Ethyl Benzene	345.7	Trace	1.3	
					Xylenes	441.2	Trace	0.813	
					Unknown	481.0	Trace	0.396	
SG12	ND	----	----	----	ND	----	----	----	----
SG13	ND	----	----	----	ND	----	----	----	----
SG14	ND	----	----	----	ND	----	----	----	----
SG15	ND	----	----	----	ND	----	----	----	----
SG16	Moderate	63.5	Unknown	25.0	Unknown	42.5	Low	15.1	206.6
					Benzene	54.6	Low	6.1	
					Unknown	75.1	Low	42.5	
					Unknown	105.5	Low	30.3	
					Toluene	129.9	Low	8.1	
					Unknown	143.2	Low	3.4	
					Unknown	156.0	Low	12.6	
					Unknown	195.2	Low	2.6	
					Unknown	209.4	Trace	2.0	
					Unknown	291.5	Low	10.4	
					Ethyl Benzene	334.9	Low	3.8	
					Unknown	430.0	Trace	0.408	
					Xylenes	468.8	Trace	0.474	
					Unknown	552.3	Trace	0.953	
					Unknown	700.7	Low	2.3	
					Unknown	778.6	Low	2.1	

LOWER BASE - SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG17	ND	----	----	----	ND	----	----	----	----
SG18	Low	13.4	Unknown	288.3	ND	----	----	----	13.4
SG19	ND	----	----	----	ND	----	----	----	----
SG20	Low	5.2	Unknown	28.0	Unknown	44.3	Trace	0.567	7.51
					Benzene	64.1	Trace	1.2	
					Toluene	136.4	Trace	0.543	
SG21	Trace	0.504	Benzene	63.7	ND	----	----	----	0.504
SG22	ND	----	----	----	ND	----	----	----	----
SG23	Trace	0.343	Benzene	64.7	ND	----	----	----	0.343
SG24	Trace	0.668	Benzene	64.9	Toluene	138.4	Trace	0.651	1.32
SG25	ND	----	----	----	ND	----	----	----	----
SG26	Moderate	50	Unknown	821.7	Unknown	45.1	Trace	0.357	162.8
					Benzene	65.3	Trace	1.6	
					Unknown	107.5	Trace	1.7	
					Unknown	167.7	Trace	1.4	
					Unknown	199.8	Trace	0.922	
					Unknown	214.8	Trace	0.508	
					Unknown	295.5	Low	19.8	
					Ethyl Benzene	337.6	Low	7.6	
					Xylenes	375.2	Low	4.4	
					Xylenes	431.1	Low	15.9	
					Unknown	471.2	Low	15.8	
					Unknown	559.3	Low	24.7	
					Unknown	682.7	Low	18.1	
SG27	Low	2.3	Unknown	524.3	Unknown	100.0	Trace	2.0	4.3
SG28	Low	3.2	Benzene	65.3	Unknown	293.9	Low	2.3	5.5
SG29	Trace	1.1	Unknown	297.1	ND	----	----	----	1.1
SG30	Low	9.6	Unknown	568.3	Benzene	65.3	Trace	1.7	38.9
					Unknown	107.5	Trace	0.423	
					Toluene	140.0	Trace	0.856	
					Unknown	218.4	Trace	0.546	
					Unknown	293.9	Low	3.3	
					Ethyl Benzene	340.3	Trace	1.3	
					Xylenes	366.2	Low	3.7	
					Xylenes	440.0	Low	5.7	
					Unknown	473.6	Low	5.1	
					Unknown	689.9	Low	6.7	
SG31	ND	----	----	----	ND	----	----	----	----
SG32	ND	----	----	----	ND	----	----	----	----
SG33	Low	7.0	Unknown	538.3	Toluene	130.8	Trace	0.837	30.6
					Unknown	276.6	Low	4.7	
					Ethyl Benzene	321.4	Low	5.4	
					Xylenes	409.1	Low	6.8	
					Unknown	443.6	Low	5.9	

LOWER BASE – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG34	ND	----	----	----	ND	----	----	----	----
SG35	ND	----	----	----	ND	----	----	----	----
SG36	ND	----	----	----	ND	----	----	----	----
SG37	ND	----	----	----	ND	----	----	----	----
SG38	ND	----	----	----	ND	----	----	----	----
SG39	Trace	1.1	Toluene	140.4	ND	----	----	----	1.1
SG40	ND	----	----	----	ND	----	----	----	----
SG41	ND	----	----	----	ND	----	----	----	----
SG42	ND	----	----	----	ND	----	----	----	----
SG43	ND	----	----	----	ND	----	----	----	----
SG44	ND	----	----	----	ND	----	----	----	----
SG45	ND	----	----	----	ND	----	----	----	----
SG46	ND	----	----	----	ND	----	----	----	----
SG47	ND	----	----	----	ND	----	----	----	----
SG48	ND	----	----	----	ND	----	----	----	----
SG49	Low	3.2	TCE	84.7	ND	----	----	----	3.2
SG50	Low	9.0	TCE	83.3	ND	----	----	----	9.0
SG51	ND	----	----	----	ND	----	----	----	----
SG52	ND	----	----	----	ND	----	----	----	----
SG53	Trace	1.1	TCE	77.7	ND	----	----	----	1.1
SG54	ND	----	----	----	ND	----	----	----	----
SG55	ND	----	----	----	ND	----	----	----	----
SG56	ND	----	----	----	ND	----	----	----	----
SG57	Trace	0.785	TCE	77.7	ND	----	----	----	0.785
SG58	ND	----	----	----	ND	----	----	----	----
SG59	ND	----	----	----	ND	----	----	----	----
SG60	Trace	0.954	Benzene	60.7	ND	----	----	----	0.954
SG61	ND	----	----	----	ND	----	----	----	----
SG62	ND	----	----	----	ND	----	----	----	----
SG63	ND	----	----	----	ND	----	----	----	----
SG64	ND	----	----	----	ND	----	----	----	----
SG65	ND	----	----	----	ND	----	----	----	----
SG66	ND	----	----	----	ND	----	----	----	----
SG67	ND	----	----	----	ND	----	----	----	----
SG68	ND	----	----	----	ND	----	----	----	----
SG69	ND	----	----	----	ND	----	----	----	----
SG70	Trace	1.3	Unknown	43.1	ND	----	----	----	1.3
SG71	Trace	0.410	Toluene	135.6	Unknown	29.8	Trace	0.379	0.789
SG72	Trace	1.6	Unknown	40.1	ND	----	----	----	1.6
SG73	Trace	1.8	Unknown	43.1	Benzene Toluene	62.9 135.6	Trace Trace	0.815 0.469	3.08
SG74	ND	----	----	----	ND	----	----	----	----

LOWER BASE – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG75	Low	4.7	Unknown	722.5	Benzene	62.7	Trace	0.730	8.4
					Toluene	134.0	Low	2.1	
					Unknown	292.3	Trace	0.432	
					Xylenes	441.2	Trace	0.433	
SG76	ND	----	----	----	ND	----	----	----	----
SG77	Low	2.6	Unknown	47.5	Benzene	61.3	Trace	1.5	4.441
					Toluene	131.6	Trace	0.341	
SG78	ND	----	----	----	ND	----	----	----	----
SG79	ND	----	----	----	ND	----	----	----	----
SG80	ND	----	----	----	ND	----	----	----	----
SG81	Low	7.0	TCE	80.5	ND	----	----	----	7
SG82	Low	7.1	TCE	81.4	Benzene	62.7	Trace	0.505	7.605
SG83	Low	10.3	TCE	80.6	Unknown	44.1	Trace	0.365	16.1
					Toluene	134.8	Low	3.6	
					Unknown	206.4	Trace	0.321	
					Unknown	283.5	Trace	1.0	
					Ethylbenzene	333.1	Trace	0.503	
SG84	Low	31.5	TCE	82.7	ND	----	----	----	31.5
SG85	Low	7.1	TCE	82.9	ND	----	----	----	7.1
SG86	Low	3.2	TCE	82.6	ND	----	----	----	3.2
SG87	High	921.0	Unknown (Benzene probably masked in peak)	52.0	Toluene	135.3	Low	9.8	932.1
					Xylenes	364.2	Trace	1.3	
SG88	Low	3.2	TCE	82.3	Benzene	63.1	Trace	0.421	3.621
SG89	Trace	1.9	TCE	82.6	Benzene	63.5	Trace	0.624	2.524
SG90	Low	3.8	TCE	82.9	ND	----	----	----	3.8
SG91	Trace	1.8	TCE	83.8	ND	----	----	----	1.8
SG92	Low	2.9	TCE	82.8	Benzene	63.3	Trace	1.9	5.6
					Toluene	135.6	Trace	0.766	
SG93	ND	----	----	----	ND	----	----	----	----
SG94	ND	----	----	----	ND	----	----	----	----
SG95	ND	----	----	----	ND	----	----	----	----
SG96	Low	2.2	Toluene	138.8	Unknown	43.3	Trace	0.616	6.74
					Unknown	47.5	Trace	1.3	
					Benzene	58.1	Trace	0.624	
					Unknown	75.9	Trace	2.0	
SG97	ND	----	----	----	ND	----	----	----	----
SG98	ND	----	----	----	ND	----	----	----	----
SG99	ND	----	----	----	ND	----	----	----	----

LOWER BASE – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG100	Moderate	124.1	Unknown	120.0	Unknown	20.9	Low	20.4	416.6
					Unknown	28.3	Low	2.8	
					Unknown	33.4	Low	2.3	
					Unknown	41.5	Low	13.0	
					Unknown	56.2	Low	8.8	
					Unknown	79.0	Moderate	90.0	
					Toluene	146.2	Low	8.0	
					Unknown	169.3	Low	30.3	
					Unknown	198.7	Low	28.7	
					Unknown	303.2	Moderate	85.4	
					Unknown	491.4	Low	2.1	
					Unknown	577.3	Trace	0.700	
SG101	ND	----	----	----	ND	----	----	----	----
SG102	ND	----	----	----	ND	----	----	----	----
SG103	ND	----	----	----	ND	----	----	----	----
SG104	ND	----	----	----	ND	----	----	----	----
SG105	ND	----	----	----	ND	----	----	----	----
SG106	ND	----	----	----	ND	----	----	----	----
SG107	Low	7.6	Xylenes	456.8	Benzene	62.5	Trace	1.4	22.3
					TCE	81.1	Trace	0.444	
					Toluene	133.6	Low	3.4	
					Unknown	297.6	Low	2.2	
					Xylenes	376.2	Low	7.3	
SG108	ND	----	----	----	ND	----	----	----	----
SG109	Low	12.2	Xylenes	377.2	Benzene	62.5	Low	3.4	38.0
					Toluene	134.0	Low	5.9	
					Unknown	297.9	Trace	0.676	
					Xylenes	458.0	Low	12.2	
					Unknown	718.7	Trace	0.435	
					Unknown	889.6	Low	3.2	
SG110	Trace	0.681	Benzene	62.3	Toluene	134.0	Trace	0.466	1.147
SG111	ND	----	----	----	ND	----	----	----	----
SG112	Trace	0.270	TCE	86.2	ND	----	----	----	0.270
SG113	Low	3.6	Unknown	309.9	Benzene	66.3	Trace	0.779	9.8
					TCE	86.5	Trace	1.0	
					Unknown	488.8	Trace	2.0	
					Unknown	584.8	Trace	0.483	
					Unknown	730.1	Trace	0.305	
					Unknown	880.4	Trace	1.6	
SG114	Low	2.3	Toluene	142.0	Unknown	77.9	Trace	1.5	5.7
					Unknown	96.1	Trace	1.9	
SG115	Trace	1.1	TCE	86.2	Benzene	66.3	Trace	0.481	1.581

LOWER BASE – SOIL GAS ANALYSIS RESULTS (continued)									
SAMPLE I.D.	SAMPLE CONCENTRATION	Vs.	INDICATOR PEAK	R.T. (Sec.)	ADDITIONAL CONSTITUENTS	R.T. (Sec.)	CONCENTRATION	Vs.	TOTAL Vs.
SG116	ND	----	----	----	ND	----	----	----	----
SG117	ND	----	----	----	ND	----	----	----	----
SG118	Trace	0.371	Benzene	66.6	ND	----	----	----	0.371
SG119	ND	----	----	----	ND	----	----	----	----
SG120	ND	----	----	----	ND	----	----	----	----
SG121	Trace	0.891	TCE	74.3	ND	----	----	----	0.891
SG122	ND	----	----	----	ND	----	----	----	----
SG123	Trace	0.579	Benzene	58.5	Toluene	125.6	Trace	0.464	1.0
SG124	ND	----	----	----	ND	----	----	----	----
SG125	ND	----	----	----	ND	----	----	----	----
SG126	ND	----	----	----	ND	----	----	----	----
SG127	ND	----	----	----	ND	----	----	----	----

NOTES:

1. Vs. is volt/seconds, which is an integrated area count of chromatographic peaks representing relative quantitation.
2. R.T. is retention time for specific compound in seconds.
3. Samples were classified by concentration using the following values: ND=<0.3 Vs.; Trace=0.3-2.0 Vs.; Low=2.1-50 Vs.; Moderate=50.1-300 Vs.; High = > 300 Vs.

APPENDIX B

TEST BORING LOGS AND MONITORING WELL CONSTRUCTION DETAILS

HYDRAULIC CONDUCTIVITY DATA

TEST BORING LOGS AND MONITORING WELL CONSTRUCTION DETAILS

LEGEND

FINE SAND	SILT AND CLAY
MEDIUM SAND	GRAVEL
COARSE SAND	TOPSOIL
FINE TO MEDIUM SAND	DREDGE SPOIL
MEDIUM TO COARSE SAND	MISCELLANEOUS FILL
FINE TO COARSE SAND	ASPHALT
SAND AND SILT	NO RECOVERY
SAND AND GRAVEL	BEDROCK
SILT	NA - DATA NOT AVAILABLE
ORGANIC SILT	? - INFERRED CONTACT
	SCREENED INTERVAL SHADED IN CROSS SECTIONS

TORPEDO SHOP

BORING LOG 7 TB 1

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: TORPEDO SHOPS
DATE STARTED: 08/09/90
DATA COMPLETED: 08/09/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 48.6
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 75°, PARTLY CLOUDY, HUMID
INSPECTOR: MICHAEL NEJDL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	%LEL	RAD. (cpm)	SAMPLE ANALYSIS
0-2	3 4 4 3	100	0.0	Dark brown, fine SAND and SILT, trace roots, damp, TOP SOIL					0	50	
				Light brown, fine SAND and SILT, damp							
2-4	4 5 5 6	80	0.1	Brown, fine SAND and SILT, moist					0	40	
4-6	6 7 7 8	90	0.4						0	40	
6-8	17 33 55 55	100	0.1						0	40	
				Red-brown, fine to medium SAND and GRAVEL, wet							
8-10	45 60 100/6	60	0.0	Brown, coarse SAND and GRAVEL, trace cobbles, wet					0	45	
10-12	32 66 80 90	100	0.0	Brown, coarse SAND and GRAVEL, wet					0	40	
12-14	85 100/2	35	0.0	AUGER REFUSAL AT 12.7 feet					0	40	

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 1.5, 7.0, 12.7

WELL CONSTRUCTION

ATLANTIC

BORING LOG 7 TB 2

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: TORPEDO SHOPS
DATE STARTED: 08/09/90
DATA COMPLETED: 08/09/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 48.8
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 78°, PARTLY CLOUDY, HUMID
INSPECTOR: MICHAEL NEJOL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	2 4 5 5	85	0.2	Dark brown, fine SAND and SILT, trace roots, damp, TOP SOIL Brown, fine to medium SAND, some silt, trace gravel, damp					0	45	
2-4	17 38 31 19	40	0.2						0	60	
4-6	34 17 19 27	60	0.0	Olive green, fine SAND and SILT, trace gravel, moist					0	60	
6-8	54 59 100/3	60	NA	Olive green, medium SAND some gravel, grading to red color, wet AUGER REFUSAL AT 7.3 feet					0	90	

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 0.75, 4.0, 6.0, 7.3

WELL CONSTRUCTION

ATLANTIC

BORING LOG 7 TB 3

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: TORPEDO SHOPS
DATE STARTED: 08/08/90
DATA COMPLETED: 08/14/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: SCOTT METCALF
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 44.9
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 75°, CLOUDY, RAIN SHOWERS
INSPECTOR: MICHAEL NEJDL AND NICOLE RUDERMAN
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	4 9 19 28	50	0.0	Dark brown, fine SAND and SILT, trace roots, damp, TOP SOIL Brown, fine SAND, trace gravel, damp					NA	40	
2-4	29 30 70 100/3	50	0.0	Brown, fine to medium SAND, trace gravel, damp					NA	50	
4-6	3 6 7 8	35	0.0	Brown, fine to medium SAND and GRAVEL, some silt, damp					0	35	
6-8	8 13 11 15	65	0.0	Brown, fine to coarse SAND and GRAVEL, some silt, damp					0	40	
8-10	2 4 DRILL	15	0.0	Brown, coarse SAND and GRAVEL, mottled, damp, DRILL WITH AIR ROTARY THROUGH BOULDER FROM 9.0 TO 10.0					0	50	
10-12	1 2 2 1	90	0.0	Brown, SILT and CLAY, some fine sand, moist					0	40	
12-14	5 7 9 7	90	0.0	Grey, fine SAND, some clay orange mottling, wet					0	40	
14-16	7 10 7 8	100	0.0						0	40	
16-18	5 7 7 13	100	0.0						0	40	
18-20	9 11 12 14	100	0.0	Brown, fine SAND and SILT, wet					0	40	
				END OF BORING AT 20.0 feet							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 0.2, 2.0, 4.0, 10.0, 12.0, 18.0, 20.0

WELL CONSTRUCTION

ATLANTIC

BORING LOG 7 TB 4

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: TORPEDO SHOPS
DATE STARTED: 08/14/90
DATA COMPLETED: 08/14/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: SCOTT METCALF
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 46.2
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 85°, LIGHT CLOUD COVER, WINDY
INSPECTOR: MICHAEL NEJDL AND NICOLE RUDERMAN
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	5 5 8 12	55	0.0	Dark brown, fine SAND and SILT, trace clay, trace roots, damp, TOP SOIL	0					0	40			0.0 0.5	
				Brown, fine SAND, trace gravel, damp										2.0	
2-4	9 7 6 4	0	NA	NO RECOVERY						NA	NA				
4-6	5 8 7 7	70	0.0	Brown, fine to medium SAND and SILT, trace clay,wet	5					0	50			4.0	
6-8	100/5 AUGER	0	NA	DRILL THROUGH BOULDERS WITH AIR ROTARY						NA	NA			6.0	
8-10	AUGER	0	NA							NA	NA				
10-12	5 7 12 10	95	0.0	Grey, fine SAND and SILT, some clay, orange banding, wet	10					0	35			10.0	
12-14	5 7 6 4	100	0.0	Grey, fine SAND and SILT, some clay, wet						0	50				
14-16	14 10 14 12	100	0.0		15					0	40				
16-18	14 14 13 10	100	0.0	Grey, fine SAND and SILT, some clay, orange banding, wet						0	50				
18-20	14 23 10 9	100	0.0	Grey, fine SAND and SILT, some clay, wet						0	40				
				END OF BORING AT 20.0 feet	20									20.0	

ATLANTIC

BORING LOG 7 TB 5

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: TORPEDO SHOPS
DATE STARTED: 08/10/90
DATA COMPLETED: 08/10/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 44.9
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 78°, CLOUDY
INSPECTOR: MICHAEL NEJDL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	2 4 5 7	90	0.0	Dark brown, fine SAND and SILT, trace roots, damp, TOP SOIL; Brown, SAND and SILT, trace gravel, damp					0	40	
2-4	9 6 5 4	20	0.0						0	40	
4-6	1 1 1 1	40	0.0	Brown, SAND and SILT, some gravel, moist					0	40	
6-8	4 2 2 2	65	0.0	Brown, SILT, trace gravel, wet at 6.5 feet					1	30	
8-10	3 4 4 4	100	NA	Grey-brown, fine SAND and SILT, wet					NA	40	
10-12	4 3 3 5	60	0.0						0	45	
12-14	4 6 6 5	100	0.0						0	42.5	
14-16	4 7 7 6	100	0.0	Red-brown, fine SAND and SILT, wet					0	30	
16-18	7 5 5 9	60	0.0	Grey-brown, fine SAND and SILT, wet					NA	30	
18-20	6 7 10 10	90	0.0	Grey-brown, SILT and CLAY, mottled, wet					NA	40	
				END OF BORING AT 20.0 feet							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 0.65, 6.0, 8.0, 18.0, 20.0

WELL CONSTRUCTION

ATLANTIC

BORING LOG 7 TB 6

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: TORPEDO SHOPS
DATE STARTED: 08/13/90
DATA COMPLETED: 08/13/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 46.4
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 85°, OVERCAST, HUMID
INSPECTOR: MICHAEL NEJDL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	4 6 6 6	55	0.0	Brown, fine to medium SAND and GRAVEL, damp,	0					0	50			0.0	
2-4	7 15 100/5	55	0.0	Brown, fine SAND and GRAVEL, moist						0	50				
4-6	5 6 8 10	40	0.0		5					0	57.5				
6-8	2 2 1 1	90	0.0	Red-brown, fine SAND and SILT, trace roots, wet						0	40			6.0	
8-10	2 2 6 8	95	0.0	Brown, fine SAND and SILT, some clay, wet						0	50.5				
10-12	5 7 7 5	95	0.0	Brown, fine SAND and SILT, wet	10					0	70				
12-14	3 4 5 4	75	0.0	Red-brown, SILT, grading to grey, SILT and CLAY, wet						0	60			12.0	
14-16	5 7 9 10	100	0.0	Grey-brown, fine SAND and SILT, some clay, wet	15					0	50			14.0	
16-18	9 10 9 11	100	0.0	Brown, fine SAND and SILT, some clay, wet						0	30				
18-20	8 9 11 10	100	0.0	Grey, fine SAND, grading to brown, fine SAND and SILT, wet						0	40				
				END OF BORING AT 20.0 feet	20									20.0	

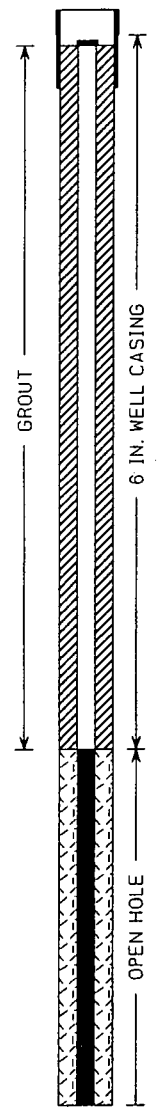
ATLANTIC

BORING LOG 7 MW 1D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: TORPEDO SHOPS
DATE STARTED: 08/10/90
DATA COMPLETED: 08/14/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 54.67
PROTECTIVE CASING ELEVATION: 54.08
WELL ELEVATION: 54.08
WATER LEVEL: 44.15 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, PARTLY CLOUDY, HUMID
INSPECTOR: LYNN METCALF AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				Brown SAND and SILT, trace roots, moist, TOP SOIL	0									0.0	
				Dark brown, SAND and GRAVEL, moderatly strong minty medicine smell, FILL	5										
				Bedrock	10									6.5	
					15										
					20										



ATLANTIC

BORING LOG 7 MW 1D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: TORPEDO SHOPS
DATE STARTED: 08/10/90
DATA COMPLETED: 08/14/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 54.67
PROTECTIVE CASING ELEVATION: 54.08
WELL ELEVATION: 54.08
WATER LEVEL: 44.15 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, PARTLY CLOUDY, HUMID
INSPECTOR: LYNN METCALF AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
				END of BORING AT 25.2 feet	26									25.2	OPEN HOLE
					31										
					36										
					41										

ATLANTIC

BORING LOG 7 MW 2S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: TORPEDO SHOPS
DATE STARTED: 08/09/90
DATA COMPLETED: 08/09/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 48.6
PROTECTIVE CASING ELEVATION: 51.35
WELL ELEVATION: 50.41
WATER LEVEL: 44.98 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, PARTLY CLOUDY
INSPECTOR: MICHAEL NEJDL AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	3 6 5 4	85	NA	Dark brown, fine SAND and SILT, trace roots, moist, TOP SOIL Brown, medium SAND and GRAVEL, trace silt, moist					0	NA	
2-4	3 18 21 10	30	NA	Brown, fine SAND and SILT, trace gravel, moist					0	NA	
4-6	3 4 6 6	20	NA						NA	NA	
6-8	18 15 5 6	50	0.0	Green-brown, fine SAND and SILT, banded with black, fine SAND and SILT, wet					0	30	
8-10	3 12 21 22	75	0.0	Green-brown, fine SAND and SILT, wet					0	57.5	
10-12	5 24 100/6	50	0.0	Green-brown, fine SAND and SILT, trace gravel, wet					0	30	
				AUGER REFUSAL AT 11.5 feet							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY — DEPTH (FT.): 0.0, 0.65, 2.0, 11.5

WELL CONSTRUCTION: GROUT, BENTONITE SEAL, SAND, 0.01 SLOTTED PVC

ATLANTIC

BORING LOG 7 MW 3S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: TORPEDO SHOPS
DATE STARTED: 08/08/90
DATA COMPLETED: 08/14/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: SCOTT METCALF
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

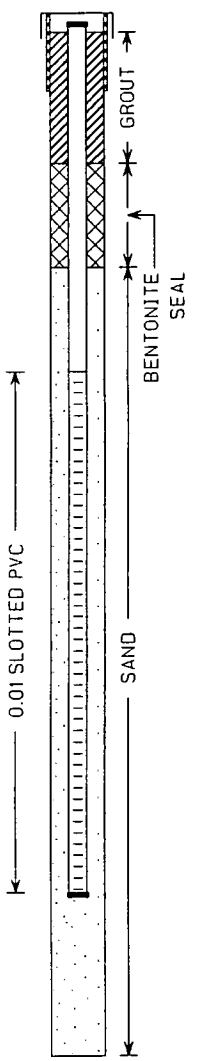
GROUND ELEVATION: 45.98
PROTECTIVE CASING ELEVATION: 45.98
WELL ELEVATION: 45.71
WATER LEVEL: 39.51 (03/21/91)
DATUM: SUBASE
WEATHER: 85°, CLOUDY, HUMID
INSPECTOR: MICHAEL NEJOL AND NICOLE RUDERMAN
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	9 15 9 6	55	0.0	Brown, fine SAND and SILT, trace roots, damp, TOP SOIL; Brown, fine SAND, trace gravel, damp,	■				0	40	
2-4	6 100/4	35	0.0		■				0	50	
4-6	5 10 28 6	50	0.0	Brown, fine SAND and GRAVEL, damp,	■				0	35	
6-8	5 2 3 5	0	NA	NO RECOVERY	■				NA	NA	■
8-10	2 4 8 12	10	0.0	Brown, coarse SAND and GRAVEL, trace cobbles, damp,	■				0	50	
10-12	1 2 2 1	85	0.0	Brown, fine SAND and SILT, some clay, moist	■				0	40	
12-14	5 7 9 7	90	0.0	Grey, fine SAND and SILT, some clay, wet	■				0	40	
14-16	7 10 7 8	100	0.0	Grey, fine to medium SAND, wet	■				0	40	
16-18	5 7 7 13	100	0.0	Grey, fine SAND and SILT, some clay, wet	■				0	40	
18-20	9 11 12 14	100	0.0	Brown, fine SAND and SILT, wet	■				0	40	
				END OF BORING AT 20.0 feet							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 0.2, 4.0, 6.0, 8.0, 10.0, 14.0, 16.0, 20.0

WELL CONSTRUCTION



ATLANTIC

GOSS COVE LANDFILL

BORING LOG 8 TB 1

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: GOSS COVE
DATE STARTED: 10/30/90
DATA COMPLETED: 10/30/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 11.4
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 60°, SUNNY, CLEAR SKIES
INSPECTOR: LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	0 31 51 72	75	4.8	Brown, fine SAND, some gravel, trace wood chips, trace glass, trace brick fragments, moist, FILL	0	■				1	40			0.0	
2-4	100 100/4	25	4.0	Light brown, fine to medium SAND and GRAVEL, trace cinders, iron staining, moist, FILL		■				1	40				
4-6	32 18 18 17	75	14.0	Black, fine SAND, grading to, orange-brown, fine to coarse SAND, trace roots, metal filings, cinders, iron staining, moist, FILL	5	■				1	70	■			
6-8	19 21 23 17	50	7.0	Grey, medium SAND and GRAVEL, moist		■				1	50			6.0	
				Brown, fine to coarse SAND, trace silt, trace clay, iron staining, moist		■								7.5	
8-10	9 11 11 12	10	0.0	Brown, fine to coarse SAND, some silt, some gravel, moist		■				1	40				
10-12	12 31 13 14	0	NA	NO RECOVERY, wet on outside of spoon at 10.0 feet	10	■				NA	NA			10.0	
12-14	8 14 13 14	0	NA			■				NA	NA				
14-16	8 3 2 4	25	15.0	Black, fine to coarse SAND, oil sheen, wet	15			■		1	40			14.0	
16-18	5 3 4 3	25	18.0					■		1	40				
18-20	5 6 6 9	75	25.0	Black, fine to coarse SAND, some gravel, oil sheen, wet				■		1	40				
				Dark brown, SILT and CLAY, trace shell fragments, trace wood fragments, black stain, oil sheen, wet	20			■						19.3	
				End of boring at 20.0 feet										20.0	

ATLANTIC

BORING LOG 8 TB 2

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: GOSS COVE
DATE STARTED: 10/30/90
DATA COMPLETED: 10/30/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 11.3
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 60°, SUNNY, CLEAR SKIES
INSPECTOR: LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	0 21 31 16	50	0.2	Brown, fine to coarse SAND and GRAVEL, trace cinders, moist, FILL	■				1	60	
2-4	17 13 11 10	50	9.5	Brown, fine SAND, some silt, trace gravel, moist, FILL	■				1	40	
4-6	6 6 9 15	25	8.5		■				1	40	
6-8	13 11 12 13	25	20.0	Brown, fine to medium SAND, some silt, wood chips, pockets of black staining, moist, FILL		■	■		1	40	■
8-10	6 6 9 6	10	5.0	Brown-black, medium SAND and GRAVEL, metal pieces, wet, FILL	■				1	40	
10-12	6 4 5 8	25	.75	Brown, fine to coarse, SAND and GRAVEL, trace metal wire, wet, FILL	■				1	40	
12-14	100/0			AUGER REFUSAL AT 12.0 feet							

LITHOLOGY — DEPTH (FT.): 0.0 – 12.0

WELL CONSTRUCTION

ATLANTIC

BORING LOG 8 TB 3

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: GOSS COVE
DATE STARTED: 11/06/90
DATA COMPLETED: 11/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 18.3
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 50°, CLEAR SKIES, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	13 17 35 44	100	1.5	Dark brown, fine SAND and organic SILT, damp, TOPSOIL; Brown, fine to coarse SAND and GRAVEL, moist, FILL	0					1	40			0.0; 0.2	
2-4	25 15 13 13	50	1.0	Brown, fine to coarse SAND and GRAVEL, trace silt, trace cobbles, damp						1	50			2.0	
4-6	5 11 47 30	25	1.0		5					1	50				
6-8	16 12 17 29	50	0.3							1	40				
8-10	16 12 17 29	10	0.0							1	50				
10-12	30 41 79 96	20	7.0		10					1	40				
12-14	29 100/0	25	0.0	AUGER REFUSAL AT 12.5 feet						1	40			12.5	
					15										
					20										

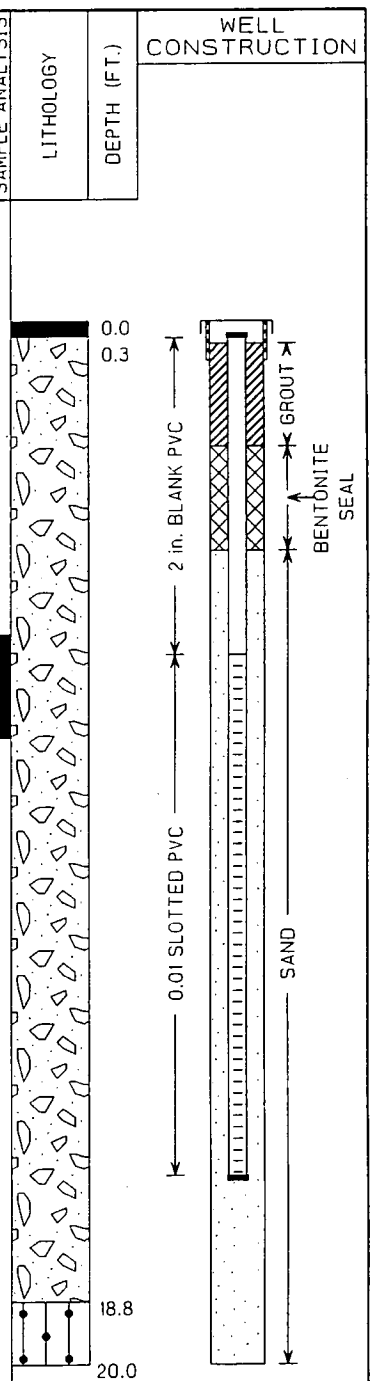
ATLANTIC

BORING LOG 8 MW 1

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: GOSS COVE
DATE STARTED: 10/30/90
DATA COMPLETED: 10/30/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 10.48
PROTECTIVE CASING ELEVATION: 10.48
WELL ELEVATION: 10.15
WATER LEVEL: 1.47 (03/21/91)
DATUM: SUBASE
WEATHER: 40°, CLEAR SKIES
INSPECTOR: ERIK NESS AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	0 28 16 22	60	0.0	0.0 - 0.3 ASPHALT Brown, fine to medium SAND, some gravel, trace glass, moist, FILL	0					1	40	
2-4	21 16 18 52	50	0.8	Brown, fine to medium SAND, some gravel, trace glass, trace metal fragments, moist, FILL						1	50	
4-6	32 26 29 23	75	2.8	Brown-black, fine SAND, some gravel, trace brick fragments, trace cinders, moist, FILL	5					1	40	
6-8	28 24 33 34	75	1.6	Brown-black, medium to coarse SAND and GRAVEL, some silt, moist, FILL						1	40	
8-10	5 6 5 21	10	7.0	Brown, fine SAND, some silt, trace brick fragments, trace cinders, trace ceramic fragments, wet at 10.0 feet, FILL						1	30	
10-12	6 5 4 5	25	17.8	Brown-black, fine SAND and GRAVEL, trace metal filings, trace brick fragments, slight oil sheen, wet, FILL	10					1	40	
12-14	7 2 3 5	25	22.0							1	40	
14-16	8 4 51 3	25	38.0	Black, medium to coarse SAND, trace brick fragments, trace metal filings, trace wire, oil sheen, wet, FILL	15					1	40	
16-18	4 4 5 4	10	4.0							1	50	
18-20	5 4 9 11	100	4.0	Black, medium to coarse SAND, trace brick fragments, trace metal filings, trace wire, trace paper, spark plug, oil sheen, wet, FILL						1	40	
				Brown-black, SILT and CLAY, trace shell fragments, wet	20							
				END OF BORING AT 20.0 feet								



ATLANTIC

BORING LOG 8 MW 2

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: GOSS COVE
DATE STARTED: 11/06/90
DATA COMPLETED: 11/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

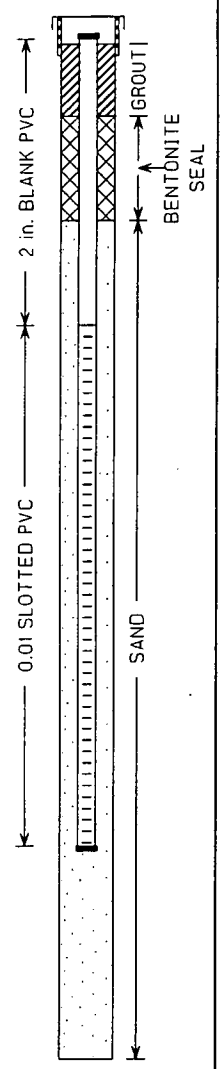
GROUND ELEVATION: 9.91
PROTECTIVE CASING ELEVATION: 9.91
WELL ELEVATION: 9.43
WATER LEVEL: 2.45 (03/21/91)
DATUM: SUBASE
WEATHER: 50°, PARTLY CLOUDY, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	0 33 51 85	75	4.5	0.0 - 0.3 ASPHALT 0.3 - 1.5 Light brown, fine to coarse SAND and GRAVEL, trace cobbles,damp, FILL 2.0 - 6.0 Grey, fine to coarse SAND, broken glass, ash, metal fragments, damp, grading to rust color	■				2	40	
2-4	23 39 40 43	50	8.0		■				2	40	
4-6	81 100/3	1	NA		■				NA	NA	
6-8	17 21 18 15	50	4.0	Grey, fine to coarse SAND, some silt, trace gravel, moist	■				1	40	
8-10	17 33 50 50	75	9.0	Grey, fine to medium SAND, some gravel, some silt, moist	■				1	30	
10-12	21 17 14 23	50	35	Grey, fine to coarse SAND and GRAVEL, some silt, black stain from 13.5 -14.0, wet	■				1	40	■
12-14	11 4 2 4	25	15		■				1	40	
14-16	6 4 6 4	0	NA	NO RECOVERY	■				NA	NA	
16-18	4 5 4 4	0	NA		■				NA	NA	
18-20	5 6 6 7	75	5.0	Grey, fine SAND and SILT, trace clay, trace shell fragments, wet	■				1	50	
				End of boring at 20.0 feet							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 6.0, 8.5, 10.0, 14.0, 18.0, 20.0

WELL CONSTRUCTION



ATLANTIC

BORING LOG 8 MW 3

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: GOSS COVE
DATE STARTED: 11/06/90
DATA COMPLETED: 11/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

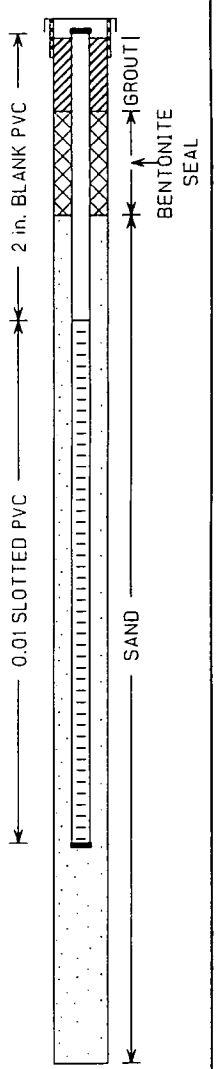
GROUND ELEVATION: 9.91
PROTECTIVE CASING ELEVATION: 9.91
WELL ELEVATION: 9.43
WATER LEVEL: 2.73 (03/21/91)
DATUM: SUBASE
WEATHER: 50°, PARTLY CLOUDY, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	0 31 67 100	100	3.0	0.0 - 0.3 ASPHALT Brown, fine to coarse SAND and GRAVEL, trace cobbles, damp, FILL					1	40	
2-4	50 45 35 15	75	10.0	Dark brown, fine to coarse SAND and GRAVEL, some silt, trace glass, trace metal filings, damp, FILL					1	40	
4-6	7 8 35 50	25	10.0						1	50	
6-8	29 45 99 85	75	5.0	Light brown, fine to coarse SAND and GRAVEL, trace silt, trace cobbles, moist, FILL Black, fine to medium SAND, some gravel, some silt, trace metal fragments, moist, FILL					1	40	
8-10	50 48 23 19	75	200	Grey, fine to coarse SAND and GRAVEL, some silt, moist, FILL Grey, fine to coarse SAND and GRAVEL, some cobbles, moist, FILL					1	40	
10-12	11 5 4 5	0	NA	Grey, fine to coarse SAND and GRAVEL, some cobbles, trace broken glass, trace wood fragments, moist, FILL NO RECOVERY					NA	NA	
12-14	5 4 6 4	0	NA						NA	NA	
14-16	4 3 4 5	0	NA						NA	NA	
16-18	4 2 1 1	0	NA						NA	NA	
18-20	2 1 1 2	50	40.0	Black, medium to coarse SAND, trace silt, wet Grey, fine SAND and SILT, trace clay, trace shell fragments, wet END OF BORING AT 20.0 feet					1	40	

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY — DEPTH (FT.): 0.0, 9.5, 18.0, 19.5, 20.0

WELL CONSTRUCTION



ATLANTIC

BORING LOG 8 MW 4

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: GOSS COVE
DATE STARTED: 11/06/90
DATA COMPLETED: 11/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

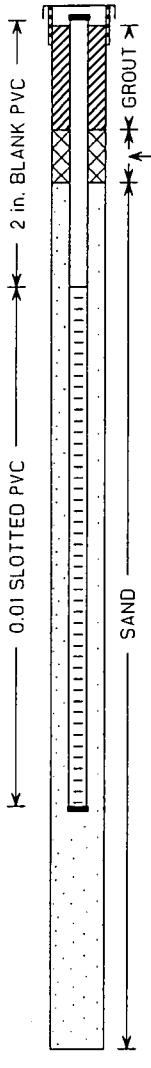
GROUND ELEVATION: 9.62
PROTECTIVE CASING ELEVATION: 9.62
WELL ELEVATION: 9.34
WATER LEVEL: 3.05 (03/21/91)
DATUM: SUBASE
WEATHER: 50°, CLEAR SKIES, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	0 18 30 35	50	3.0	0.0 - 0.3 ASPHALT Brown, fine to coarse SAND and GRAVEL, some silt, damp, FILL					1	40	
2-4	37 55 73 84	75	0	Light brown, fine to coarse SAND and GRAVEL, trace silt, damp, FILL Grey, fine SAND and SILT, rust-brown mottling, trace sand blast sand, damp, FILL					1	40	
4-6	71 80 43 30	75	11.0	Light brown, fine to coarse SAND and GRAVEL, trace cobbles, trace silt, damp, FILL					1	40	
6-8	12 15 14 13	25	7.0	Light brown, fine to coarse SAND and GRAVEL, trace cobbles, trace silt, trace sand blast sand, damp, FILL Red and pink, brick fragments and building material, damp, FILL					1	40	
8-10	13 1 2 5	50	1.0	Dark brown, fine to coarse SAND, some gravel, some silt, moist, FILL Dark brown, fine to coarse SAND and GRAVEL, trace metal, trace light bulb pieces, oil sheen, wet, FILL					1	40	
10-12	5 17 100/3	0	NA	NO RECOVERY					NA	NA	
12-14	2 2 2 3	0	NA						NA	NA	
14-16	2 3 9 7	25	2.0	Black, fine SAND, some silt, trace gravel, wet					1	40	
16-18	1 1 2 3	25	3.0						1	40	
18-20	3 6 2 3	100	5.0	Grey, fine SAND and SILT, trace clay, trace shell fragments, wet END OF BORING AT 20.0 feet					1	40	

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 0.3, 10.0, 14.0, 19.0, 20.0

WELL CONSTRUCTION



ATLANTIC

SPENT ACID STORAGE AND DISPOSAL AREA

BORING LOG 15 TB 1

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: SPENT ACID STORAGE
DATE STARTED: 10/18/90
DATA COMPLETED: 10/18/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RABB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 28.5
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 70°, PARTLY CLOUDY
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	14 5 4 8	50	0.4	0.0 - 0.1 ASPHALT Brown, fine to coarse SAND, some gravel, orange staining, damp	0					1	50			0.0 0.1	
2-4	6 4 3 3	50	0.4							1	50				
4-6	4 6 5 4	50	0.4	Brown, fine to medium SAND, trace silt, trace clay, orange staining, damp	5					1	30			4.0	
6-8	3 4 4 3	50	11.0							1	30				
8-10	7 9 8 9	50	1.8	Grey, fine to coarse SAND, some silt, wet at top						1	60			8.0	
10-12	3 6 5 5	50	0.4		10						40				
12-14	4 5 7 6	100	0.4							1	40				
14-16	4 4 4 5	75	1.0	Grey, fine SAND, trace silt, wet	15					1	40			15.0	
16-18	5 5 4 5	75	0.4							1	40				
18-20	6 7 8 7	100	0.4							1	40				
				Grading to some silt, rust colored mottling, wet END OF BORING AT 20.0 feet	20									20.0	

ATLANTIC

BORING LOG 15 TB 2

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: SPENT ACID STORAGE
DATE STARTED: 10/23/90
DATA COMPLETED: 10/23/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RABB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 28.3
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 60°, RAIN
INSPECTOR: LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	11 7 5 4	20	1.0	Brown-black, medium SAND and GRAVEL, wet.	■				0	40	■		0.0	
2-4	7 7 3 7	50	3.0	Yellow-brown, fine SAND, wet	■				0	40	■		2.0	
4-6	7 3 5 6	NR	0.0	NO RECOVERY	■				0	40	■		4.0	
6-8	4 5 10 13	100	0.0	6.0 - 6.2 Brown, medium SAND, trace fine sand 6.2 - 6.4 Black, wood ash 6.4 - 7.5 Yellow-brown, very fine SAND, trace silt, 7.5 - 8.0 Grey, very fine SAND, trace silt, wet	■				0	40	■		6.0	
8-10	10 7 10 8	100	0.0	Tan, fine to medium SAND, wet	■				0	30				
10-12	9 5 5 8	75	0.0	Grey, fine SAND and SILT, some clay, wet Light brown, very fine SAND and SILT, trace gravel, wet	■				0	40			10.0	
12-14	4 4 7 6	100	0.0	Light brown, fine SAND and SILT, occasional clay lens, wet	■				0	40				
14-16	7 5 5 5	100	0.0	Tan, fine to medium SAND, trace silt, wet	■				0	40			14.0	
16-18	5 7 7 8	100	0.0	Grading to some silt, trace, clay, wet	■				0	40				
18-20	7 8 7 6	100	0.0	Tan, fine to medium SAND, trace coarse sand, trace clay, wet Light brown, very fine SAND, some silt, wet	■				0	40			19.0	
				END OF BORING AT 20.0 feet									20.0	

DEPTH (FT.): 0, 5, 10, 15, 20

ATLANTIC

BORING LOG 15 TB 3

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: SPENT ACID STORAGE
DATE STARTED: 10/24/90
DATA COMPLETED: 10/24/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: FRANK WARE
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 28.0
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 60°, CLOUDY SKIES
INSPECTOR: LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	10 10 20 10	50	0.0	Brown, fine to medium SAND and GRAVEL, moist	0					0	50			0.0	
2-4	10 6 6 5	75	0.0	Brown to orange mottled, fine SAND, trace silt, trace wood fragments at top, moist						0	60			2.0	
4-6	1 1 3 4	50	0.0		5					0	80				
6-8	10 3 6 10	50	0.0							0	40				
8-10	7 7 7 6	100	0.0	Grey, fine to medium SAND, some silt, wet						0	40			8.0	
10-12	3 7 7 10	100	0.0	Grey, fine to medium SAND, trace silt, wet	10					0	40			11.0	
				Light brown, very fine SAND and SILT, trace clay, iron staining, wet											
12-14	1 1 3 2	50	0.0	Grading to fine to very fine SAND and SILT, wet						0	40				
14-16	5 8 7 8	75	4.0	Grading to very fine SAND and SILT, trace clay, iron staining, wet	15					0	40				
16-18	3 4 3 4	50	3.0	Light brown, fine SAND and SILT, wet						0	40				
18-20	7 4 5 6	100	0.0	Tan-grey, fine to very fine SAND, trace silt, wet						0	50			18.0	
				Light brown, very fine SAND, some silt, wet	20									20.0	
				END OF BORING AT 20.0 feet											

ATLANTIC

FORMER GASOLINE STATION

BORING LOG 18 TB 1

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: FORMER GASOLINE STATION
DATE STARTED: 11/01/90
DATA COMPLETED: 11/01/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 34.5
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 40°, PARTLY CLOUDY, WINDY
INSPECTOR: LYNN METCALF AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	19 14 16 18	25	1.0	Brown, fine to medium SAND and GRAVEL, moist					1	60			0.0	
2-4	9 7 5 4	0	NA	NO RECOVERY					NA	NA			2.0	
4-6	3 4 3 3	10	0.0	Brown, fine SAND, trace silt, trace ash, moist					1	50			4.0	
6-8	2 1 2 2	50	0.0	Brown, fine to medium SAND, trace gravel, trace silt, moist					1	40			6.0	
8-10	17 19 21 42	75	7.5						1	50				
10-12	37 30 41 43	75	7.5	Brown, fine to coarse SAND and GRAVEL, moist					1	60			10.0	
12-14	31 23 11 12	75	1.0						1	40				
14-16	14 11 11 15	80	0.8	Light brown, fine SAND, trace gravel, moist					1	40			13.5	
16-18	17 10 12 13	80	25.0						1	50				
18-20	17 10 9 11	60	0.5						1	40				
				END OF BORING at 20.0 feet									20.0	

DEPTH (FT.): 0, 5, 10, 15, 20

ATLANTIC

BORING LOG 18 TB 2

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: FORMER GASOLINE STATION
DATE STARTED: 11/01/90
DATA COMPLETED: 11/01/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 34.8
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 40°, PARTLY CLOUDY, WINDY
INSPECTOR: LYNN METCALF AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	AUGER 17 12	25	0.0	0.0 - 0.1 ASPHALT 0.1 - 0.85 CONCRETE Brown, medium SAND trace gravel, moist					1	40	
2-4	6 6 6 6	0	NA	NO RECOVERY					NA	NA	
4-6	4 5 4 4	25	0.0	Brown, medium SAND, some gravel, trace silt, moist					1	40	
6-8	3 2 2 2	25	2.0						1	40	
8-10	3 2 2 2	10	0.0						1	40	
10-12	4 6 7 6	5	0.0						1	40	
12-14	9 9 8 7	50	7.5						1	30	
14-16	6 9 10 8	50	0.5	Light brown, medium to coarse SAND and GRAVEL, moist Light brown, fine to coarse SAND, trace gravel, moist					1	50	
16-18	6 8 8 8	75	4.0						1	40	
18-20	12 8 10 11	50	0.5						1	40	
				END OF BORING AT 20.0 feet							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 0.85, 2.0, 4.0, 13.4, 14.0, 20.0

WELL CONSTRUCTION

ATLANTIC

BORING LOG 18 TB 3

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: FORMER GASOLINE STATION
DATE STARTED: 11/01/90
DATA COMPLETED: 11/01/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 35.3
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 40°, PARTLY CLOUDY, WINDY
INSPECTOR: LYNN METCALF AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	AUGER 5 4	100	1.5	0.0 - 0.1 ASPHALT 0.1 - 0.85 CONCRETE Brown, fine to medium SAND, some gravel, trace silt, moist	0					1	50			0.0 0.85	
2-4	3 2 1 3	75	11.0							1	50				
4-6	6 17 16 14	100	7.5		5					1	40				
6-8	10 12 9 12	75	9.0							1	40				
8-10	17 16 21 21	75	10.0							1	40				
10-12	24 37 31 24	60	4.0	Light brown, medium to coarse SAND and GRAVEL, moist	10					1	40			10.5	
12-14	29 19 18 17	50	9.0							1	40				
14-16	15 11 11 10	60	15.0		15					1	40			15.5	
16-18	4 10 11 13	50	12.0	Light brown, fine to medium SAND, zones of brown staining, moist						1	50			17.7	
18-20	10 12 16 12	60	11.0	Light brown, fine SAND, grading to tan-gray color, moist	20					1	40			20.0	
				END OF BORING AT 20.0 feet											

ATLANTIC

BORING LOG 18 TB 4

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: FORMER GASOLINE STATION
DATE STARTED: 11/01/90
DATA COMPLETED: 11/01/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 35.4
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 40°, PARTLY CLOUDY, WINDY
INSPECTOR: LYNN METCALF, ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	AUGER	30	NA	0.0 - 0.1 ASPHALT 0.1 - 0.85 CONCRETE AUGER TO 2.0 feet	0	■				NA	NA		■	0.0 0.85	
2-4	4 4 5 6	75	0.0	Dark brown, fine to medium SAND, some gravel, trace silt, moist		■				0	60			2.0	
4-6	12 11 10 13	75	1.0		5	■				0	50				
6-8	6 6 7 11	75	1.5			■				0	30				
8-10	20 17 26 21	100	1.3			■				0	40				
10-12	27 30 30 34	60	0.5	Light brown, medium to coarse SAND and GRAVEL, moist	10	■				0	50			10.8	
12-14	30 29 22 32	100	1.0			■				0	40				
14-16	25 17 12 11	60	1.0		15	■				0	80			15.3	
16-18	13 9 5 10	75	1.0	Light brown, fine to medium SAND, moist		■				0	40	■		17.4	
18-20	9 7 9 11	50	NA	Light brown, fine SAND, grading to coarse sand at 19.0 feet, moist		■				0	NA	■			
				END OF BORING AT 20.0 feet	20									20.0	

ATLANTIC

BORING LOG 18 TB 5

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: FORMER GASOLINE STATION
DATE STARTED: 11/01/90
DATA COMPLETED: 11/01/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 35.4
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 40°, PARTLY CLOUDY, WINDY
INSPECTOR: LYNN METCALF, ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	AUGER 16 18	30	NA	0.0 - 0.1 ASPHALT 0.1 - 0.85 CONCRETE AUGER TO 2.0 feet	0	■				NA	NA		■	0.0 0.85	
2-4	18 17 18 16	50	0.0	Brown, fine to medium SAND, some gravel, trace silt, moist		■				0	50			2.0	
4-6	11 7 6 9	60	0.0		5	■				0	40				
6-8	12 10 11 16	40	0.0			■				0	40				
8-10	15 17 27 36	75	3.5			■				0	40				
10-12	35 40 52 41	80	8.5		10	■				0	80	■			
12-14	17 15 15 16	90	6.0	Light brown, fine to coarse SAND and GRAVEL, moist		■				0	60	■		11.65	
14-16	18 19 15 14	0	NA	NO RECOVERY	15	■				NA	NA			14.0	
16-18	11 9 10 10	50	NA	Light brown, fine to coarse SAND and GRAVEL, moist		■				0	50			16.0	
18-20	10 9 9 9	75	4.5	Light brown, fine to medium SAND, trace gravel, moist		■				0	40			18.0	
				END OF BORING AT 20.0 feet	20									20.0	

ATLANTIC

AREA A

BORING LOG 2W TB-1

PROJECT: IR STUDY NSB - MLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 9/05/90
DATA COMPLETED: 9/05/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 67.5
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 75°, PARTLY CLOUDY
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					0									0.0	
0-2	WOH 1	0	NA	WATER AND ROOTS						NA	NA			2.0	
2-4	WOH	0	NA	NO RECOVERY						NA	NA				
4-6	WOH	0	NA		5					NA	NA				
6-8	WOH	0	NA							NA	NA				
8-10	WOH	30	1.0	Dark grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL						0	30			8.0	
10-12	WOH	100	1.0		10					0	30			12.0	
				AUGER TO 15.0 feet											
15-17	WOH 1 1 1	100	12.0	Dark grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL	15					0	30			15.0	
				AUGER TO 20.0 feet										17.0	
20-22		100	17.0	Dark grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL	20					0	30			20.0	

ATLANTIC

BORING LOG 2W TB 1

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 9/05/90
DATA COMPLETED: 9/05/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 67.5
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 75°, PARTLY CLOUDY
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
20-22					21									22.0	
				AUGER TO 25.0 feet											
25-27		100	8.0	Grading to little clay, little sand	26					0	30			25.0 27.0	
				AUGER TO 30.0 feet											
30-32		100	1.0	Dark grey, SILT, little clay, little sand, trace shell fragments, wet, DREDGE SPOIL	31					0	30			30.0 31.7	
				Dark brown, organic SILT and CLAY, trace fine sand, trace roots, TOP SOIL										32.0	
				END BORING AT 32.0 feet											
					36										
					41										

ATLANTIC

BORING LOG 2W TB 2

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1056-10
LOCATION: AREA A WETLAND
DATE STARTED: 9/06/90
DATA COMPLETED: 9/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 68.2
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 70°, FOGGY
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	WOH 1	100	0.4	Red brown, organic silt, some roots, moist					1	40			0.0 / 1.0	
				Dark grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL										
2-4	WOH	100	0.6						1	30				
4-6	WOH	100	1.0						1	50			6.0	
				AUGER TO 10.0 feet										
10-12	WOH 1 1	100	3.0	Dark grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL					1	50			10.0 / 12.0	
				AUGER TO 15.0 feet										
15-17	WOH 1 1	100	3.00	Dark grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL					1	50			15.0 / 17.0	
				AUGER TO 20.0 feet										
20-22	WOH WOH 1 1	100	19.0	Dark grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL					1	50			20.0	

DEPTH (FT.): 0, 5, 10, 15, 20

ATLANTIC

BORING LOG 2W TB 2

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 9/06/90
DATA COMPLETED: 9/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 68.2
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 70°, FOGGY
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
20-22	WOH WOH 1 1				21									22.0	
				AUGER TO 25.0 feet											
25-27	WOH WOH 2 1	100	7.0	Dark grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL	26					1	40			25.0 27.0	
				AUGER TO 30.0 feet											
30-32	WOH 3 3	100	1.0	Dark grey, SILT, little clay, little sand, trace shell fragments, wet, DREDGE SPOIL	31					1	40			30.0 31.6	
				Dark brown, organic SILT and CLAY, trace fine sand, trace roots, TOP SOIL										31.9	
				Grey, fine SAND and SILT, trace clay, wet,										32.0	
				END BORING AT 32.0 feet	36										
					41										

ATLANTIC

BORING LOG 2W TB 3

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 8/31/90
DATA COMPLETED: 8/31/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 7.9
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 85°, HAZY, HUMID
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					0									0.0	
0-2	11 11	0	NA	ALL ROOTS AND WATER						NA	NA				
2-4	WOH	0	NA							NA	NA				
4-6	WOH	100	0.6	Grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL	5					0	30			6.0	
				AUGER TO 10.0 feet											
10-12	WOH	100	14.0	Grey, SILT and CLAY, little fine sand, trace shell fragments, wet, DREDGE SPOIL	10					0	30			10.0 12.0	
				AUGER TO 15.0 feet											
15-17	WOH	100	8.0	Grey, SILT and CLAY, little fine sand, trace shell fragments, wet, DREDGE SPOIL	15					0	30			15.0 17.0	
				AUGER TO 20.0 feet											
20-22	11 11	100	10.0	Grey, SILT and CLAY, little fine sand, trace shell fragments, wet, DREDGE SPOIL	20					0	30			20.0	

ATLANTIC

BORING LOG 2W TB 3

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 8/31/90
DATA COMPLETED: 8/31/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 71.9
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 85°, HAZY, HUMID
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
20-22	11 11				21									22.0	
				AUGER TO 25.0 feet											
25-27	11 10 60	100	NA	Grey, SILT and CLAY, little fine sand, trace shell fragments, wet. DREDGE SPOIL	26					NA	NA			25.0 26.0	
				Dark brown, organic SILT and CLAY, trace fine sand, trace roots, wet. TOP SOIL										26.3	
				Grey, fine SAND and SILT, trace clay, wet.										27.0	
				END BORING AT 27.0 feet											
					31										
					36										
					41										

ATLANTIC

BORING LOG 2W TB 4

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1056-10
LOCATION: AREA A WETLAND
DATE STARTED: 9/06/90
DATA COMPLETED: 9/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 83.5
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 80°, HAZY, HUMID
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	6 100/4	40	0.2	Dark brown, organic SILT and CLAY, trace fine sand, trace roots, damp, TOP SOIL	0					0	30			0.0	
				Grey, fine SAND and SILT, trace clay, damp										0.3	
				AUGER REFUSAL AT 0.83 feet.										0.83	
					5										
					10										
					15										
					20										

ATLANTIC

BORING LOG 2W TB 6

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 9/06/90
DATA COMPLETED: 9/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 70.3
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 80°, HAZY, HUMID
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					0									0.0	
0-2	WOH 1 1	50	0.2	Dark brown, ORGANIC SILT and ROOTS, wet Grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL						1	30			0.3	
2-4	WOH	100	0.2							1	30				
4-6	WOH	100	7.0	Grey, SILT and CLAY, little fine sand, trace shell fragments, wet, DREDGE SPOIL	5					1	50			6.0	
				AUGER TO 10.0 feet											
10-12	WOH	0	NA	NO RECOVERY	10					NA	NA			10.0	
12-14	WOH 1 1 1	0	NA							NA	NA			14.0	
				AUGER TO 15.0 feet	15									15.0	
15-17	WOH 1	100	5.0	Grey, SILT and CLAY, little fine sand, trace shell fragments, wet, DREDGE SPOIL						1	40			17.0	
				AUGER TO 20.0 feet	20									20.0	
20-22	WOH 1 1 1	100	5.0	Grey, SILT and CLAY, little fine sand, trace shell fragments, wet, DREDGE SPOIL						1	40				

ATLANTIC

BORING LOG 2W TB 6

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 9/06/90
DATA COMPLETED: 9/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOHN YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 70.3
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 80°, HAZY, HUMID
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
20-22	WOH 1 1 1				21									22.0	
				AUGER TO 25.0 feet										25.0	
25-27	22 100/3	40	0.2	Grey, SILT and CLAY, little fine sand, trace shell fragments, wet. DREDGE SPOIL, end of spoon had weathered rock.	26					1	40			25.7	
				AUGER REFUSAL AT 25.7 feet											
					31										
					36										
					41										

ATLANTIC

BORING LOG 2W TB 7

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 9/05/90
DATA COMPLETED: 9/05/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 77.0
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 65°, PARTLY CLOUDY
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	WOH 11	90	0.2	Dark brown, ORGANIC SILT and ROOTS, moist Grey brown, SILT and CLAY, trace fine sand, mottled, moist, DREDGE SPOIL	0					1	30			0.0 0.4	
2-4	11 11	80	2.0	Grey brown, SILT and CLAY, trace fine sand, trace shell fragments, moist, DREDGE SPOIL						1	30				
4-6	WOH WOH 11	100	1.0	Grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL	5					1	30			6.0	
				AUGER TO 10.0 feet											
10-12	WOH 1	100	0.2	Grey, SILT and CLAY, trace fine sand, trace shell fragments, wet DREDGE SPOIL	10					1	30			10.0 12.0	
				AUGER TO 13.5 feet											
13.5-15.5	100/2	100	0.2	Grey, SILT and CLAY, trace fine sand, trace shell fragments, wet DREDGE SPOIL AUGER REFUSAL AT 13.7 feet	15					1	30			13.5 13.7	
					20										

ATLANTIC

BORING LOG 2W TB 8

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 8/30/90
DATA COMPLETED: 8/30/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 79.8
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 85°, HAZY, HOT AND HUMID
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (FT)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					0									0.0	
0-2	2 1 1 1	0	NA	ROOTS, NO SOIL RECOVERY						NA	NA			1.0	
2-4	WOH	30	1							0	30				
4-6	WOH 1 1	0	NA		5					NA	NA				
6-8	1 1 WOH WOH	100	2.0	Grey, SILT and CLAY, trace fine sand, trace shell fragments, wet. DREDGE SPOIL						0	30			6.0	
	AUGER			AUGER TO 10.0 feet										8.0	
10-12	WOH WOH 1 2	100	1.0	Grey, SILT and CLAY, trace fine sand, trace shell fragments, wet. DREDGE SPOIL	10					0	30			10.0	
12-14	2 4 3 9	75	0.8	Dark brown, organic SILT and CLAY, trace fine sand, trace roots. TOP SOIL; Grey, fine SAND and SILT, trace clay, wet						0	30			11.5 11.7 12.0	
				Grey, fine SAND, some silt, wet; END OF BORING AT 14.0 feet	15									14.0	
					20										

ATLANTIC

BORING LOG 2W MW 1S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/24/90
DATA COMPLETED: 08/24/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 128.05
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 70°, PARTLY CLOUDY
INSPECTOR: MICHAEL NEJOL AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	4 8 11 11	85	0.1	Brown, fine to coarse SAND and GRAVEL, trace silt, damp	0					0	40			0.0	
2-4	11 14 32 100/6	100	0.0	Red-brown, fine SAND and SILT, trace gravel, damp						0	60			2.0 4.0	
4-6	100/1	0	NA	AUGER REFUSAL AT 4.0 feet, no water encountered, no well installed	5					NA	NA				
					10										
					15										
					20										

ATLANTIC

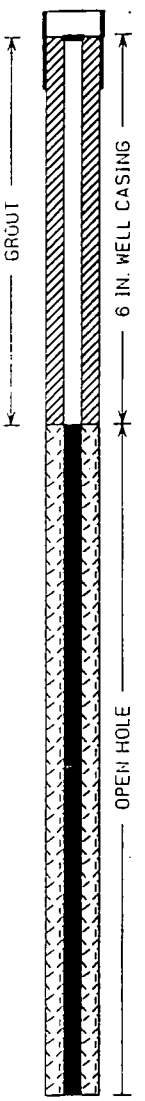
BORING LOG 2W MW 1D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/28/90
DATE COMPLETED: 09/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 128.05
PROTECTIVE CASING ELEVATION: 127.58
WELL ELEVATION: 127.58
WATER LEVEL: 10.88 (03/21/91)
DATUM: SUBASE
WEATHER: 70°, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				NOT SAMPLED	0									0.0
				BEDROCK										3.00
					5									
					10									
					15									
					20									

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2W MW 1D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/28/90
DATA COMPLETED: 09/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 128.05
PROTECTIVE CASING ELEVATION: 127.58
WELL ELEVATION: 127.58
WATER LEVEL: 10.88 (03/21/91)
DATUM: SUBASE
WEATHER: 70°, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
					26										
					31										OPEN HOLE
					36										
					41										

ATLANTIC

BORING LOG 2W MW 1D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 09/28/90
DATA COMPLETED: 09/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 128.05
PROTECTIVE CASING ELEVATION: 127.58
WELL ELEVATION: 127.58
WATER LEVEL: 10.88 (03/21/91)
DATUM: SUBASE
WEATHER: 70°, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (FT)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					42										OPEN HOLE
					47										
					52										
					57										
					62										

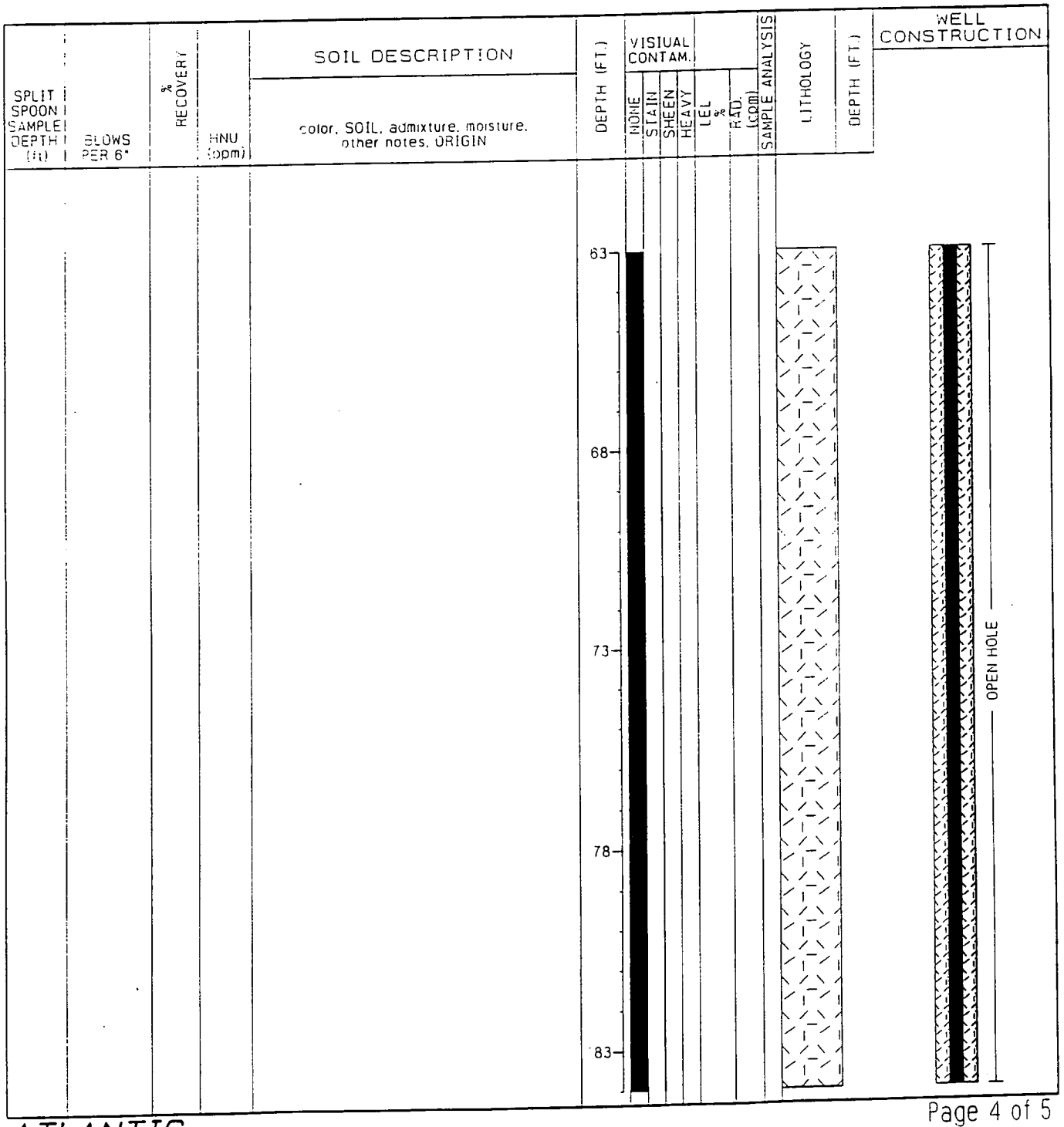
ATLANTIC

BORING LOG 2W MW 1D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/28/90
DATA COMPLETED: 09/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 128.05
PROTECTIVE CASING ELEVATION: 127.58
WELL ELEVATION: 127.58
WATER LEVEL: 10.88 (03/21/91)
DATUM: SUBASE
WEATHER: 70°, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					63										
					68										
					73										
					78										
					83										



ATLANTIC

BORING LOG 2W MW 1D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/28/90
DATA COMPLETED: 09/06/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 128.05
PROTECTIVE CASING ELEVATION: 127.58
WELL ELEVATION: 127.58
WATER LEVEL: 10.88 (03/21/91)
DATUM: SUBASE
WEATHER: 70°, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (FT)	BLOWS PER 6"	% RECOVERY (cm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				84										
				89										OPEN HOLE
				94									95.55	
			END OF BORING AT 95.55 feet											
				99										
				104										

ATLANTIC

BORING LOG 2W MW 2S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/23/90
DATA COMPLETED: 08/23/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 110.45
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 70°, CLOUDY
INSPECTOR: MICHAEL NEJOL AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	4 5 9 10	70	0.0	Brown, medium to coarse SAND and GRAVEL, damp, FILL	0					0	60			0.0	
2-4	4 5 3 2	45	0.0	Brown, fine SAND and GRAVEL, trace silt, trace asphalt, damp, FILL						0	60				
4-6	5 64 100/2	50	1.2	Dark brown, fine SAND and SILT, trace asphalt, trace roots, moist, FILL	5					0	40			5.0	
				5.0-11.8 Light to dark grey, fine grained gneiss, quartz, plagioclase, biotite, and potassium feldspar, occasional potassium feldspar rich coarse grained bands. Mamacoke Formation	10										
				11.8-23.0 Light grey to orange pink, fine to medium grained gneiss. Mamacoke Formation	15										
					20										

ATLANTIC

BORING LOG 2W MW 2S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/23/90
DATA COMPLETED: 08/23/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 110.45
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 70°, CLOUDY
INSPECTOR: MICHAEL NEJOL AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: TINGE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
				No water encountered, no well installed, end of core at 23.0 ft.										23.0	
					26										
					31										
					36										
					41										

ATLANTIC

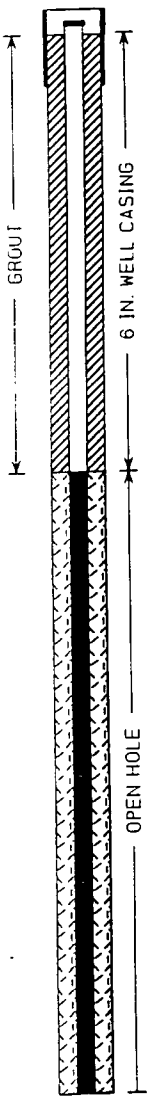
BORING LOG 2W MW 2D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/28/90
DATA COMPLETED: 09/04/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 110.45
PROTECTIVE CASING ELEVATION: 110.22
WELL ELEVATION: 110.22
WATER LEVEL: 22.85 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, FOGGY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				NOT SAMPLED	0									0.0
				BEDROCK	5									4.00
					10									
					15									
					20									

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2W MW 2D

PROJECT: IR STUDY NSB - ALCN
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/28/90
DATA COMPLETED: 09/04/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 110.45
PROTECTIVE CASING ELEVATION: 110.22
WELL ELEVATION: 110.22
WATER LEVEL: 22.35 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, FOGGY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										OPEN HOLE
					26										
					31										
					36										
					41										

BORING LOG 2W MW 2D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 09/28/90
DATA COMPLETED: 09/04/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 110.45
PROTECTIVE CASING ELEVATION: 110.22
WELL ELEVATION: 110.22
WATER LEVEL: 22.85 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, FOGGY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					42										
					47										
				END OF BORING AT 49.93 feet										49.93	OPEN HOLE
					52										
					57										
					62										

ATLANTIC

BORING LOG 2W MW 3S

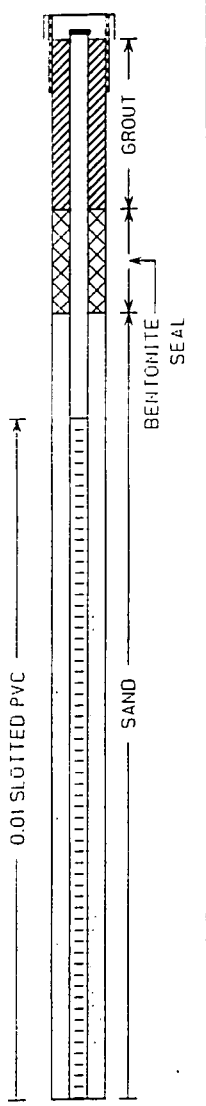
PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/22/90
DATA COMPLETED: 08/22/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 82.6
PROTECTIVE CASING ELEVATION: 84.50
WELL ELEVATION: 84.37
WATER LEVEL: 73.78 (03/21/91)
DATUM: SUBASE
WEATHER: 60°, LIGHT RAIN
INSPECTOR: MICHAEL NEJDL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	5 8 7 5	60	0.0	Dark brown, fine SAND and SILT, trace root fragments, damp, TOP SOIL Brown, fine to medium SAND and GRAVEL, damp, grading to wet at 10.0 feet, FILL	0					0	50	
2-4	3 7 7 5	15	0.0							0	35	
4-6	7 9 9 8	20	0.0		5					0	40	
6-8	6 5 4 4	10	0.0							0	35	
8-10	2 4 15 24	15	NA							NA	NA	
10-12	13 15 5 4	45	0.0	Brown, coarse SAND and GRAVEL, some silt, wet, FILL	10					0	50	
12-14	3 4 3 4	75	0.0	Red-brown, coarse SAND and GRAVEL, trace silt, wet, FILL						0	30	
14-16	1 1 1 1	65	0.1	Grey, SILT and CLAY, trace shell fragments, wet, DREDGE SPOIL	15					0	50	
16-18	1 1 2 1	100	18.0							0	40	
18-20	2 2 2 2	70	60.0							0	20	
20-22	WOH WOH 1 1	85	75.0	Dark grey, SILT and CLAY, trace shell fragments, wet, heavy oil stain, DREDGE SPOIL	20					0	30	

LITHOLOGY (DEPTH (FT.)): 0.0, 0.35, 15.0

WELL CONSTRUCTION



ATLANTIC

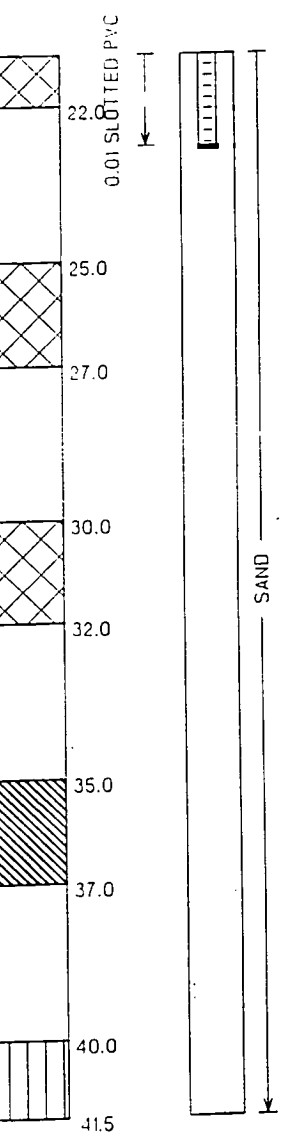
BORING LOG 2W MW 3S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/22/90
DATA COMPLETED: 08/22/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 82.8
PROTECTIVE CASING ELEVATION: 84.50
WELL ELEVATION: 84.37
WATER LEVEL: 73.78 (03/21/91)
DATUM: SUBASE
WEATHER: 60°, LIGHT RAIN
INSPECTOR: MICHAEL NEJDL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
20-22	WOH WOH 1 1				21				■					22.0
				AUGER TO 25.0 feet										
25-27	WOH WOH 1 1	100	12.0	Dark brown, SILT and CLAY, trace shell fragments, wet, DREDGE SPOIL	26	■				19	40			25.0 / 27.0
				AUGER TO 30.0 feet										
30-32	WOH WOH 1 1	100	35.0	Dark brown, SILT and CLAY, trace shell fragments, wet, DREDGE SPOIL	31	■				0	40			30.0 / 32.0
				AUGER TO 35.0 feet										
35-37	1 1 6 7	100	1.0	Red-brown, fine SAND and SILT, trace roots, wet, TOP SOIL	36	■				0	30			35.0 / 37.0
				AUGER TO 40.0 feet										
40-42	19 17 11 100/3	10	0.7	Brown, fine SAND and SILT, trace gravel, wet,	41	■				0	40			40.0 / 41.5
				AUGER REFUSAL AT 41.5 feet										

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2W MW 3D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/22/90
DATA COMPLETED: 08/28/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 81.68
PROTECTIVE CASING ELEVATION: 81.36
WELL ELEVATION: 81.36
WATER LEVEL: 5.73 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, MOSTLY CLEAR
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (FT)	BLOWS PER 6"	% RECOVERY	PID (PPM)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	H.ATL. (ppm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				FOR OVERBURDEN SOIL DESCRIPTION SEE BORING LOG 2WMW3S	0									0.0	GROUT; 6 IN. WELL CASING
					5										
					10										
					15										
					20										

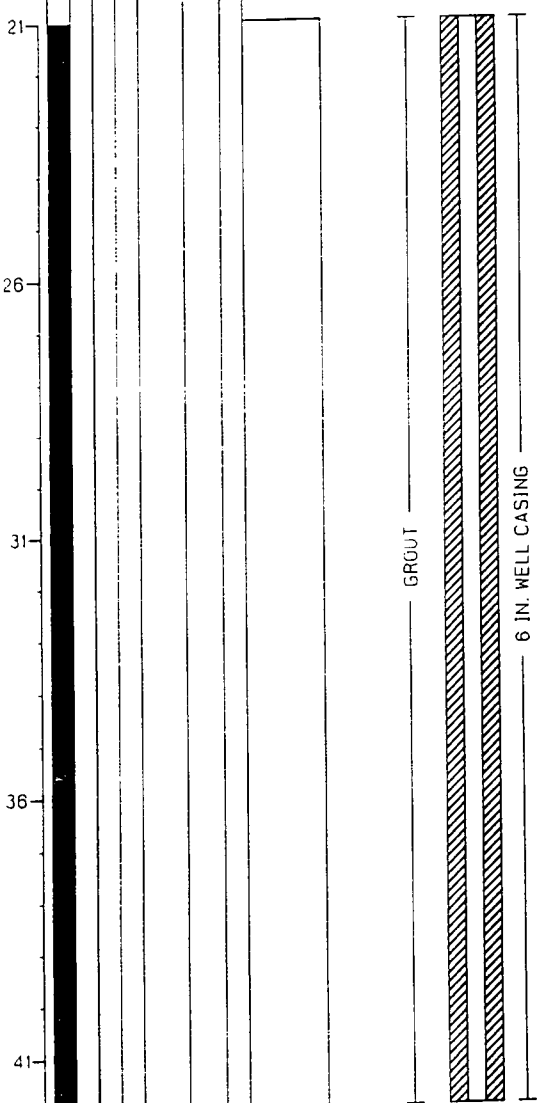
ATLANTIC

BORING LOG 2W MW 3D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/22/90
DATA COMPLETED: 08/28/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 81.68
PROTECTIVE CASING ELEVATION: 81.36
WELL ELEVATION: 81.36
WATER LEVEL: 5.73 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, MOSTLY CLEAR
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
					26										
					31										
					36										
					41										



ATLANTIC

BORING LOG 2W MW 3D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/22/90
DATA COMPLETED: 08/28/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 81.68
PROTECTIVE CASING ELEVATION: 81.36
WELL ELEVATION: 81.36
WATER LEVEL: 5.73 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, MOSTLY CLEAR
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

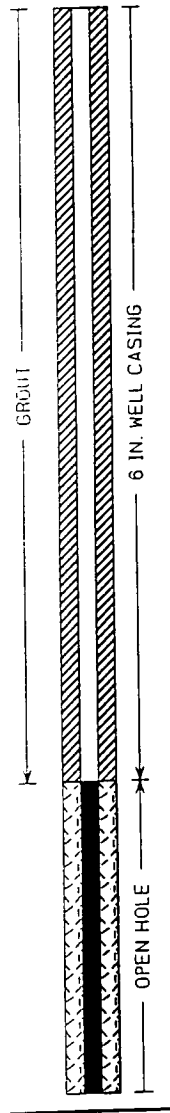
SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					42										GROUT; 6 IN. WELL CASING
					47										
					52										
					57										
					62										

BORING LOG 2W MW 3D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/22/90
DATA COMPLETED: 08/28/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 81.68
PROTECTIVE CASING ELEVATION: 81.36
WELL ELEVATION: 81.36
WATER LEVEL: 5.73 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, MOSTLY CLEAR
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					63										
					68										
				BEDROCK	73									73.0	
					78										
					83										



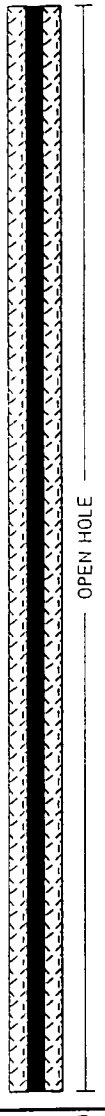
ATLANTIC

BORING LOG 2W MW 3D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1056-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/22/90
DATA COMPLETED: 08/28/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 81.68
PROTECTIVE CASING ELEVATION: 81.36
WELL ELEVATION: 81.36
WATER LEVEL: 5.73 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, MOSTLY CLEAR
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (FT)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: HOLE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					84										
					89										
					94										
					99										
					104										



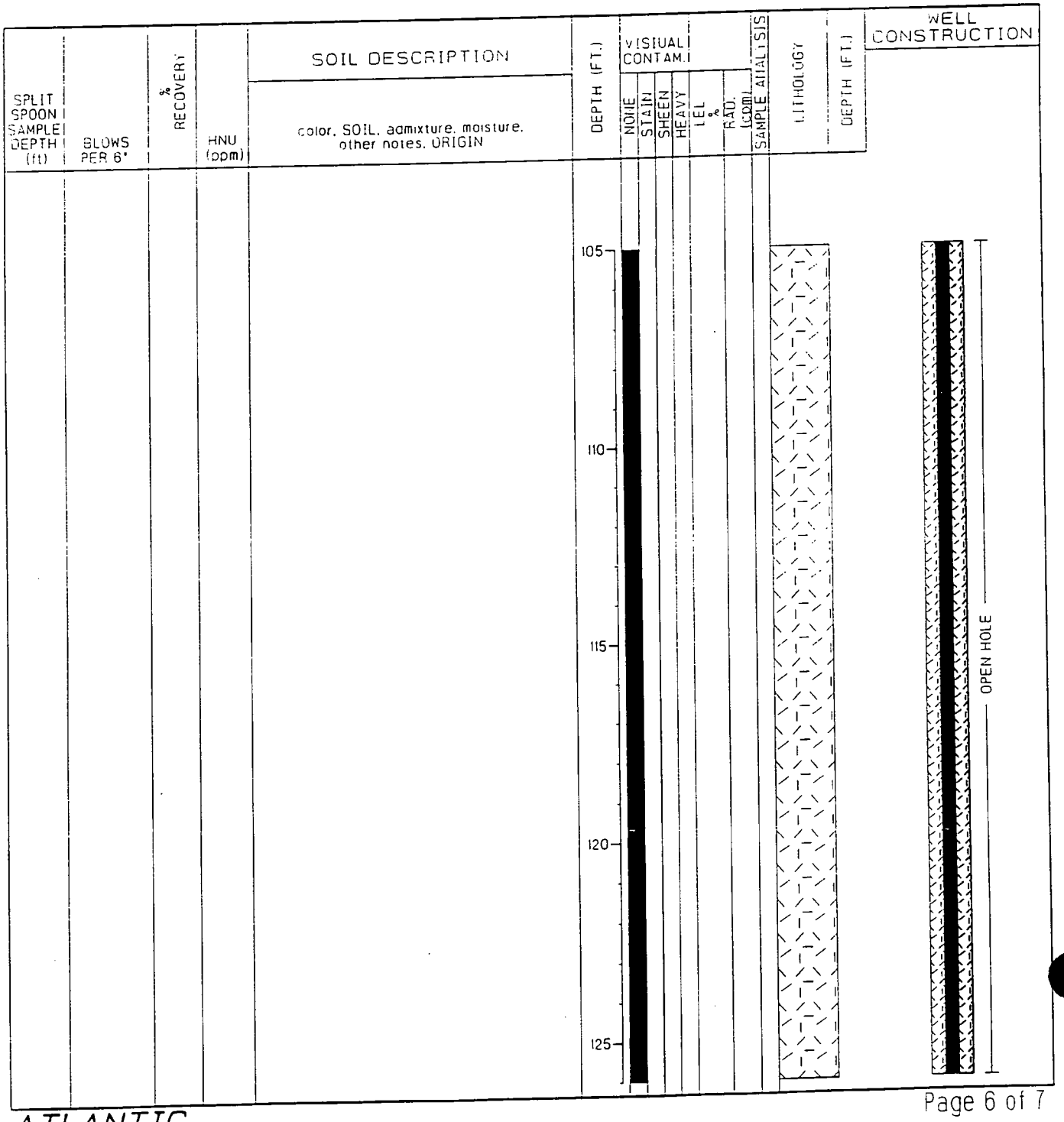
ATLANTIC

BORING LOG 2W MW 3D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/22/90
DATA COMPLETED: 08/28/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 81.68
PROTECTIVE CASING ELEVATION: 81.36
WELL ELEVATION: 81.36
WATER LEVEL: 5.73 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, MOSTLY CLEAR
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (CPM)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					105										
					110										
					115										
					120										
					125										



ATLANTIC

BORING LOG 2W MW 3D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1056-10
LOCATION: AREA A WETLAND
DATE STARTED: 08/22/90
DATA COMPLETED: 08/28/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 81.68
PROTECTIVE CASING ELEVATION: 81.36
WELL ELEVATION: 81.36
WATER LEVEL: 5.73 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, MOSTLY CLEAR
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				END OF BORING AT 127.12 feet	126									127.1	OPEN HOLE
					131										
					136										
					141										
					146										

ATLANTIC

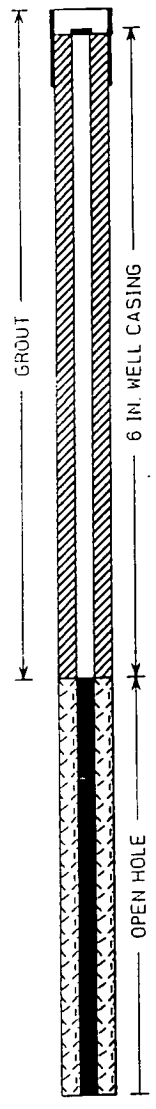
BORING LOG 2W MW 4D

PROJECT: IR STUDY NSB - HLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 09/19/90
DATA COMPLETED: 09/27/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 93.07
PROTECTIVE CASING ELEVATION: 92.69
WELL ELEVATION: 92.69
WATER LEVEL: 7.43 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, CLEAR, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				FOR OVERBURDEN SOIL DESCRIPTION SEE BORING LOG 2WMW4S	0									0.0
				BEDROCK	5									9.0
					10									
					15									
					20									

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2W MW 4D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 09/19/90
DATA COMPLETED: 09/27/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 93.07
PROTECTIVE CASING ELEVATION: 92.69
WELL ELEVATION: 92.69
WATER LEVEL: 7.43 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, CLEAR, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: HOME	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										OPEN HOLE
					26										
					31										
					36										
					41										

BORING LOG 2W MW 4D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 09/19/90
DATA COMPLETED: 09/27/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 93.07
PROTECTIVE CASING ELEVATION: 92.69
WELL ELEVATION: 92.69
WATER LEVEL: 7.43 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, CLEAR, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					42										
					47										
					52										OPEN HOLE
					57										
					62										

ATLANTIC

BORING LOG 2W MW 4D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 09/19/90
DATA COMPLETED: 09/27/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 93.07
PROTECTIVE CASING ELEVATION: 92.69
WELL ELEVATION: 92.69
WATER LEVEL: 7.43 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, CLEAR, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					63										OPEN HOLE
					68										
					73										
					78										
					83										

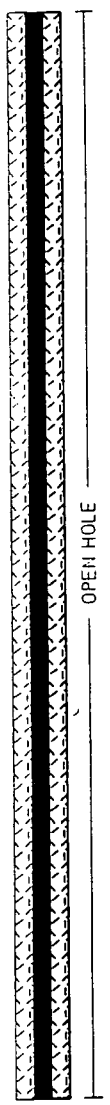
ATLANTIC

BORING LOG 2W MW 4D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 09/19/90
DATE COMPLETED: 09/27/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 93.07
PROTECTIVE CASING ELEVATION: 92.69
WELL ELEVATION: 92.69
WATER LEVEL: 7.43 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, CLEAR, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					84										
					89										
					94										
					99										
					104										



ATLANTIC

BORING LOG 2W MW 4D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1296-10
LOCATION: AREA A WETLAND
DATE STARTED: 09/19/90
DATA COMPLETED: 09/27/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 93.07
PROTECTIVE CASING ELEVATION: 92.69
WELL ELEVATION: 92.69
WATER LEVEL: 7.43 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, CLEAR, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: HOME STAIN	SHEEN	HEAVY	LEL %	RAD. (kcm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					105									
					110									
					115									
				END OF BORING AT 119.38 feet	120								119.4	OPEN HOLE
					125									

ATLANTIC

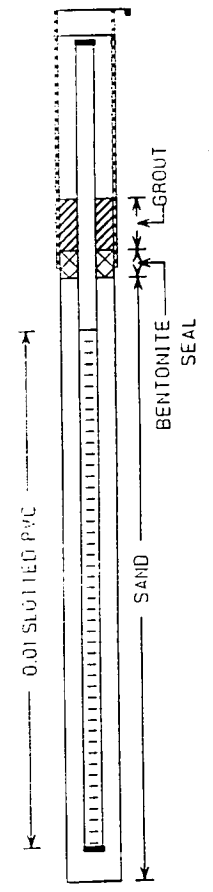
BORING LOG 2W MW 5S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 9/4/90
DATA COMPLETED: 9/4/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 73.5
PROTECTIVE CASING ELEVATION: 77.16
WELL ELEVATION: 76.48
WATER LEVEL: 73.80 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, CLEAR SKIES
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
0-2	2 2 2 2	100	0.6	Dark brown, organic SILT, trace roots, damp, TOP SOIL.	0					0	30			0.0 0.2
				Gray brown, SILT and CLAY, trace fine Sand, mottled, moist, DREDGE SPOIL										
2-4	3 2 3 2	100	0.6	Grading to trace shell fragments						0	40			
4-6	1 2 1 2	100	0.6	Grading to wet.	5					0	60			
				AUGER TO 10.0 feet										6.0
10-12	1 1 2 11	30	0.6	Gray brown, SILT and CLAY, trace fine Sand, mottled, wet, DREDGE SPOIL	10					0	30			10.0
				AUGER TO 13.0 feet										13.0
13-13.2	100/2"	100	0.6	Gray, fine to coarse SAND, little fine Gravel, little Silt, wet. END OF BORING AT 13.2 feet	15					0	40			13.2
					20									

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2W MW 6S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 10/03/90
DATA COMPLETED: 10/03/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 83.4
PROTECTIVE CASING ELEVATION: 85.03
WELL ELEVATION: 84.67
WATER LEVEL: 77.04 (03/21/91)
DATUM: SUBASE
WEATHER: 70°, CLEAR SKIES
INSPECTOR: ANNA SULLIVAN AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS
0-2	16 16 3 7	75	0.1	Dark brown, organic SILT and CLAY, some sand, trace roots, damp, TOP SOIL; Light brown, fine to coarse SAND, some silt, trace gravel, damp, FILL					2	50	
2-4	8 8 9 10	100	0.1	Gray, SILT and CLAY, some fine Sand, moist, mottled, DREDGE SPOIL					2	50	
4-6	7 7 9 11	100	0.1						2	40	
6-8	20 8 8 7	30	0.1	Brown, fine to medium SAND, trace gravel, trace silt, trace wood, wet at 6.6 feet					2	30	
8-10	7 9 32 65	75	0.1	Brown, fine SAND and GRAVEL, trace silt, wet; AUGER REFUSAL AT 9.5 feet					2	30	

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY — DEPTH (FT.): 0.0, 0.1, 1.0, 5.9, 8.3, 9.5

WELL CONSTRUCTION: GROUT, BENTONITE SEAL, SAND, 0.01 SLOTTED PVC

ATLANTIC

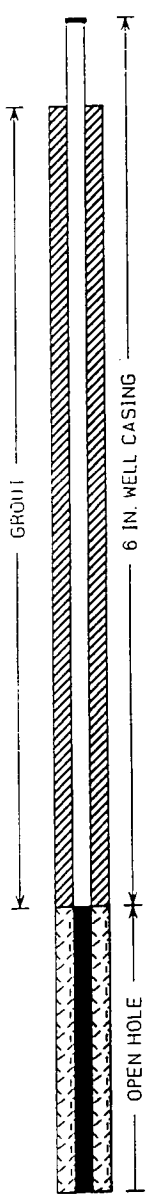
BORING LOG 2W MW 6D

PROJECT: IR STUDY NSB - HLON
PROJECT NO: 1256-10
LOCATION: AREA A WETLAND
DATE STARTED: 09/20/90
DATA COMPLETED: 09/21/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 83.2
PROTECTIVE CASING ELEVATION: 84.87
WELL ELEVATION: 84.87
WATER LEVEL: 9.93 (03/21/91)
DATUM: SUBASE
WEATHER: 60°, CLEAR, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				FOR OVERBURDEN SOIL DESCRIPTION SEE BORING LOG 2LMW6S	0									0.0
					5									
					10									10.5
				BEDROCK										
					15									
					20									

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2W MW 6D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1255-10
LOCATION: AREA A WETLAND
DATE STARTED: 09/20/90
DATA COMPLETED: 09/21/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 83.2
PROTECTIVE CASING ELEVATION: 84.87
WELL ELEVATION: 84.87
WATER LEVEL: 9.93 (03/21/91)
DATUM: SUBASE
WEATHER: 60°, CLEAR, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
					26										
					31										OPEN HOLE
					36										
					41										

BORING LOG 2W MW 6D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1056-10
LOCATION: AREA A WETLAND
DATE STARTED: 09/20/90
DATA COMPLETED: 09/21/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 83.2
PROTECTIVE CASING ELEVATION: 84.87
WELL ELEVATION: 84.87
WATER LEVEL: 9.93 (03/21/91)
DATUM: SUBASE
WEATHER: 60°, CLEAR, SUNNY
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					42									46.0	OPEN HOLE
				END OF BORING AT 46.03 feet	47										
					52										
					57										
					62										

ATLANTIC

BORING LOG 2L TB 1

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 9/25/90
DATA COMPLETED: 9/25/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 84.0
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 65°, CLEAR SKIES
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. HOME	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	3 2 4 6	50	0.2	Brown, fine to medium SAND, trace silt, trace gravel, trace asphalt, damp, FILL	0					1	30			0.0	
2-4	14 19 9 10	50	0.2							1	30			4.0	
4-6	7 6 8 9	0	NA	NO RECOVERY	5					NA	NA				
6-8	4 6 7 8	10	0.2	Brown, fine to medium SAND, trace silt, trace gravel, trace plastic, moist, FILL						1	40			6.0	
8-10	4 4 4 3	1	0.2	Brown, fine to medium SAND, some silt, wet, FILL						1	40				
10-12	2 2 2 2	0	NA	NO RECOVERY	10					NA	NA			10.0	
12-14	3 3 4 3	100	0.2	Grey, SILT and CLAY, trace fine sand, trace shell fragments, trace wood fragments, wet, DREDGE SPOIL						1	30			12.0	
14-16	2 2 2 4	100	0.2		15					1	30			16.0	
16-18	2 2 1 1	0	NA	NO RECOVERY						NA	NA				
18-20	2 2 2 2	10	1.0	Grey, SILT and CLAY, trace fine sand, trace shell fragments, trace wood fragments, wet, DREDGE SPOIL						1	40			18.0	
				AUGER REFUSAL AT 20.0 feet	20									20.0	

ATLANTIC

BORING LOG 2L TB 2

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1255-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/16/90
DATA COMPLETED: 08/16/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: SCOTT METCALF
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 84.6
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 85°, CLEAR SKIES
INSPECTOR: MICHAEL NEJOL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	5 16 16 17	55	2.0	Brown, fine SAND and GRAVEL, damp, FILL					0.0	60	
2-4	26 14 8 5	45	21.0	Dark brown, fine SAND and GRAVEL, damp, FILL					0.0	60	
4-6	16 7 6 5	60	4.0	Grey-brown, fine SAND and GRAVEL, moist, FILL					0.0	55	
6-8	11 8 [illegible]	35	5.5	Dark brown, medium SAND and GRAVEL, moist, FILL					0.0	50	
8-10	11 5 6 9	10	2.0	Dark brown, medium SAND, some gravel, moist, FILL					0.0	50	
10-12	7 2 1 2	10	3.0	Brown, medium SAND, some gravel, moist, FILL					0.0	40	
12-14	1 1 1 1	95	1.3	Dark brown, coarse SAND and GRAVEL, wet, FILL; Dark brown, SILT and CLAY, wet, DREDGE SPOIL					0.0	60	
14-16	1 1 1 1	0	NA	NO RECOVERY					NA	NA	
16-18	NA	0	NA						NA	NA	
18-20	1 1 1 1	5	2.0	Dark brown, SILT and CLAY, some fine sand, wet, oil sheen on water, DREDGE SPOIL					0.0	50	
20-22	1 1 1 1	45	1.0	Grey-brown, SILT and CLAY, wet, DREDGE SPOIL					NA	NA	

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / WELL CONSTRUCTION — DEPTH (FT.): 0.0, 12.4, 14.0, 18.0

ATLANTIC

BORING LOG 2L TB 2

PROJECT: IR STUDY NSB - MLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/16/90
DATA COMPLETED: 08/16/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: SCOTT METCALF
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 84.6
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 85°, CLEAR SKIES
INSPECTOR: MICHAEL NEJOL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
20-22	11 11				21										
22-24	1 16 49 100/2	90	0.0	Brown, fine to coarse SAND and GRAVEL, wet						0.0	60			22.0 24.0	
				AUGER REFUSAL AT 24.0 feet	26										
					31										
					36										
					41										

ATLANTIC

BORING LOG 2L TB 3

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 9/25/90
DATA COMPLETED: 9/25/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 84.6
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 75°, CLEAR SKIES
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	4 7 9 7	80	0.4	Brown, fine to medium SAND, some gravel, trace silt, damp, FILL Dark brown staining at 1.5 to 1.8 feet.	0					1	40			0.0	
				Brown, fine to medium SAND, some gravel, trace silt, damp, FILL											
2-4	3 5 5 8	30	0.4							1	50				
4-6	4 4 5 9	10	0.4	Brown, fine to medium SAND, some gravel, trace silt, damp, FILL	5					1	30				
6-8	4 3 5 7	5	0.4	Small piece of wood in shoe of spoon.						1	30				
8-10	4 5 2 1	5	0.4	Small flakes of rusted metal, wet at 10.0 feet, FILL						1	30				
10-12	1 2 1 2	0	NA	NO RECOVERY	10					NA	NA			10.0	
12-14	1 1 1 1	75	1.0	Grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL						1	40			12.0 14.0	
14-16	AUGER	NA	NA	AUGER TO 18.0 feet	15					NA	NA				
16-18	AUGER	NA	NA							NA	NA			18.0	
18-20	100/1	NA	NA	REFUSAL AT 18.0 feet	20					NA	NA				

ATLANTIC

BORING LOG 2L TB 4

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 9/20/90
DATA COMPLETED: 9/20/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 88.2
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 60°, PARTLY CLOUDY
INSPECTOR: MICHAEL NEJOL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	19 17 100/2	50	0.4	Brown, medium SAND and GRAVEL, damp, FILL Brown, medium SAND and GRAVEL, blue ash, wood fragments, red brick fragments, damp, FILL	0					0	50			0.0	
2-4	6 12 33 10	70	0.4							0	40				
4-6	7 6 11 4	40	0.7	Brown to blue, fine SAND and ASH, concrete, damp, FILL	5					0	55				
6-8	7 11 4 4	35	0.7	Dark brown, medium to coarse, SAND and ASH, wood, concrete fragments, wet at 8.0 feet, FILL						0	50				
8-10	13 7 7 6	25	0.9	Dark brown, fine to medium SAND and ASH, wet, FILL	10					0	50				
10-12	7 5 5 6	10	0.4							0	40				
12-14	1 1 1 1	50	0.4	Grey, SILT and CLAY, trace fine sand, trace shell fragments, wet, DREDGE SPOIL						0	30			12.5	
14-16	1 1 1 1	60	0.4		15					0	50				
				AUGER REFUSAL AT 17.0 feet										16.0	
				End of boring at 17.0.										17.0	
					20										

ATLANTIC

BORING LOG 2L TB 5

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 9/21/90
DATA COMPLETED: 9/24/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 88.0
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 60°, CLEAR SKIES
INSPECTOR: MICHAEL NEJOL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	7 55 22 17	70	0.7	Light brown, medium SAND and GRAVEL, some ash, asphalt, damp, FILL	0					0	50			0.0	
2-4	10 32 100/5	10	1.0	ASPHALT Dark brown, fine to medium SAND, some wood fragments, damp, FILL						0	NA				
4-6	7 3 1 1	30	0.4	Dark brown, fine to medium SAND, some wood fragments, damp, FILL	5					0	60				
6-8	6 38 7 4	30	1.0	Dark brown, fine to medium SAND and GRAVEL, wet at 8.0 feet, FILL						0	45				
8-10	10 13 4 6	80	1.6	Dark brown, fine SAND and GRAVEL, wet, FILL						0	40				
				AUGER REFUSAL AT 10.0 feet	10									10.0	
					15										
					20										

ATLANTIC

BORING LOG 2L TB 6

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/08/90
DATA COMPLETED: 08/08/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 88.4
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 75°, LIGHT RAIN
INSPECTOR: MICHAEL NEJDL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	15 20 22 29	65	0.4	Brown, fine to medium SAND and GRAVEL, trace glass, trace brick fragments, damp, FILL	0					0	37.5			0.0	
2-4	NA	60	0.4	Brown, fine to coarse SAND and GRAVEL, damp, FILL						0	40			4.0	
				AUGER TO 5.0 feet											
5-7	14 19 20 30	60	0.4	Brown, fine SAND and SILT, trace gravel, trace ash, moist, FILL	5					0	60			5.0	
7-9	3 4 4 5	0	NA	NO RECOVERY						NA	NA			7.0	
9-11	3 2 2 3	25	0.4	Brown, fine to coarse SAND, moist, FILL	10					0	40			9.0	
11-13	2 3 3 4	35	NA	Brown, fine to coarse SAND, some silt, wet, FILL						0	50			13.0	
13-15	2 1 1 2	80	NA	Brown, SILT and CLAY, trace fine sand, wet, DREDGE SPOIL						0	40				
15-17	4 4 3 11	100	NA	Grey-brown, SILT and CLAY, trace fine sand, wet, DREDGE SPOIL	15					0	40				
17-19	11 25 30 32	100	NA							0	30			19.0	
19-21	32 35 55 100/3	90	NA	Brown, coarse SAND and GRAVEL, wet	20					0	40			21.0	

ATLANTIC

BORING LOG 2L TB 7

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1056-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/07/90
DATA COMPLETED: 08/07/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 87.4
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 75°, CLOUDY WITH SHOWERS
INSPECTOR: ERIK NESS AND FRANCIS DUMONT
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (FT)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	9 9 9 28	10	0.0	Grey, coarse SAND and GRAVEL, damp, FILL	0					0	40			0.0	
2-4	4 6 7 4	10	0.0	Brown fine SAND, some gravel, trace cardboard, damp, FILL						0	40			4.0	
4-6	4 8 3 2	30	0.0	Grey, SILT and CLAY, trace sand, trace gravel, damp, DREDGE SPOIL	5					0	40				
6-8	4 8 8 8	30	0.0	Grey, fine SAND and SILT, trace gravel, damp, DREDGE SPOIL						0	30				
8-10	4 11 9 9	40	0.0							0	30				
10-12	38 14 14 40	30	0.0	Grey, fine SAND and SILT, moist, DREDGE SPOIL	10					0	30			12.2	
12-14	100/3	30	0.0	AUGER REFUSAL AT 12.2 feet						0	40				
					15										
					20										

ATLANTIC

BORING LOG 2L MW 7S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/07/90
DATA COMPLETED: 08/07/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 82.8
PROTECTIVE CASING ELEVATION: 84.50
WELL ELEVATION: 84.37
WATER LEVEL: 74.47 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, LIGHT RAIN
INSPECTOR: ERIK NESS AND FRANCIS DUMONT
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISUAL CONTAM. HOME	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	5 7 7 10	20	0.0	Brown, coarse SAND and GRAVEL, damp, FILL					0	40	
2-4	9 8 8 5	20	0.0	Grey-brown, fine to medium SAND, some gravel, damp, FILL					0	40	
4-6	1 2 6 3	10	0.0						0	40	
6-8	6 8 3 3	10	0.0	Grey-brown, fine to medium SAND, some gravel, trace wood fragments, damp, FILL					0	35	
8-10	5 2 2 2	10	0.0	Grey-brown, fine to medium SAND, some gravel, damp, FILL					0	40	
10-12	3 5 1 8	25	0.0	Brown, medium to coarse SAND and GRAVEL, trace wood fragments, moist, FILL					0	40	
12-14	3 2 1 2	90	0.0	Dark grey, medium to coarse SAND, some gravel, moist, FILL					0	40	
14-16	3 2 1 2	5	0.0	Dark brown, fine to medium SAND, some silt, wet, FILL					0	40	
16-18	1 2 1 1	5	0.0	Dark grey, SILT and CLAY, some sand, wet, DREDGE SPOIL					0	40	
18-20	1 1 1 2	50	0.0	Dark grey, SILT and CLAY, trace plastic, wet, DREDGE SPOIL					0	40	
20-22	WOH WOH 1 2	80	0.0	Dark grey, SILT and CLAY, trace shell fragments, wet, DREDGE SPOIL					0	40	

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY — DEPTH (FT.): 0.0, 16.0

WELL CONSTRUCTION: GROUT, BENTONITE SEAL, SAND, 0.01 SLOTTED PVC

ATLANTIC

BORING LOG 2L MW 7S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/07/90
DATA COMPLETED: 08/07/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 82.8
PROTECTIVE CASING ELEVATION: 84.50
WELL ELEVATION: 84.37
WATER LEVEL: 74.47 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, LIGHT RAIN
INSPECTOR: ERIK NESS AND FRANCIS DUMONT
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
20-22	WOH WOH 1 2				21							
22-24	1 2 1 1	50	0.0							0	40	
24-26	WOH WOH 1 1	100	0.0							0	40	
					26							
26-28	1 1 1 2	100	0.0							0	40	
28-30	4 5 6 12	100	0.0							0	40	
				Light brown, medium to coarse SAND, little silt, wet								
30-32	100/3	50	0.0	30.2-36.6 Light grey to orange pink, quartz, potassium feldspar, plagioclase, biotite, granitic gneiss. Mamacoke Formation	31					0	40	
					36							
				36.6-44.8 White to light grey-orange pink, medium grained, quartz, plagioclase, potassium feldspar, biotite, granitic gneiss. Mamacoke Formation								
					41							

LITHOLOGY — DEPTH (FT.): 29.8, 30.2

WELL CONSTRUCTION: 0.01 SLOTTED PVC; SAND; BENTONITE PELLETS

ATLANTIC

BORING LOG 2L MW 7S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/07/90
DATA COMPLETED: 08/07/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 82.8
PROTECTIVE CASING ELEVATION: 84.50
WELL ELEVATION: 84.37
WATER LEVEL: 74.47 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, LIGHT RAIN
INSPECTOR: ERIK NESS AND FRANCIS DUMONT
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				44.8-50.0 Grading to biotite rich fine grained bands, and orange-pink to grey fine to medium grained bands of primarily quartz, potassium feldspar and plagioclase.	42, 47, 52, 57, 62									50.0	BENTONITE PELLETS

ATLANTIC

BORING LOG 2L MW 7D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/15/90
DATA COMPLETED: 08/09/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 83.1
PROTECTIVE CASING ELEVATION: 85.16
WELL ELEVATION: 85.16
WATER LEVEL: 70.76 (03/21/91)
DATUM: SUBASE
WEATHER: 85°, MOSTLY SUNNY, HUMID
INSPECTOR: LYNN METCALF AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RED. (ppm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				FOR OVERBURDEN SOIL DESCRIPTION SEE BORING LOG 2LMW7S	0									0.0	GROUT; 6 IN. WELL CASING
					5										
					10										
					15										
					20										

ATLANTIC

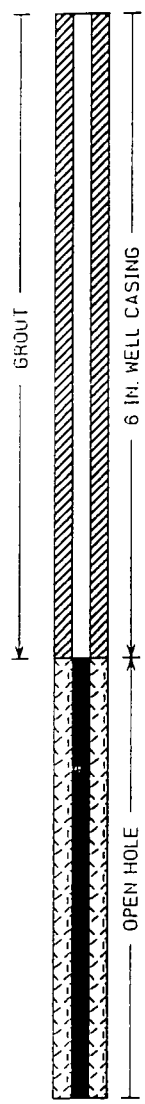
BORING LOG 2L MW 7D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/15/90
DATA COMPLETED: 08/09/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 83.1
PROTECTIVE CASING ELEVATION: 85.16
WELL ELEVATION: 85.16
WATER LEVEL: 79.76 (03/21/91)
DATUM: SUBASE
WEATHER: 85°, MOSTLY SUNNY, HUMID
INSPECTOR: LYNN METCALF AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: HOME	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
					21									
					26									
				BEDROCK										28.5
					31									
					36									
					41									

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2L MW 7D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/15/90
DATA COMPLETED: 08/09/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 83.1
PROTECTIVE CASING ELEVATION: 85.16
WELL ELEVATION: 85.16
WATER LEVEL: 79.76 (03/21/91)
DATUM: SUBASE
WEATHER: 85°, MOSTLY SUNNY, HUMID
INSPECTOR: LYNN METCALF AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					42									43.59	OPEN HOLE
				END OF BORING AT 43.59 feet	47										
					52										
					57										
					62										

ATLANTIC

BORING LOG 2L MW 8S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/02/90
DATA COMPLETED: 08/03/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: SCOTT METCALF
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

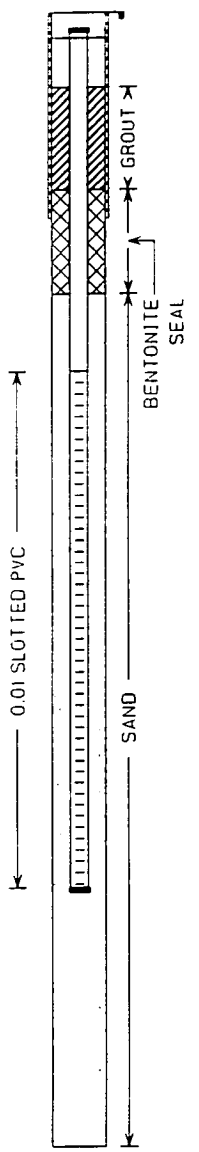
GROUND ELEVATION: 86.40
PROTECTIVE CASING ELEVATION: 87.85
WELL ELEVATION: 87.45
WATER LEVEL: 86.74 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, MOSTLY SUNNY
INSPECTOR: MICHAEL NEJDL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	3 2 45 14	30	NA	Brown, fine SAND, some gravel, damp, FILL	■				0	60	
2-4	2 1 1 2	10	NA		■				0	40	
4-6	7 6 6 4	40	NA	Dark brown, fine to medium SAND, trace brick fragments, trace paper, damp, FILL	■				0	40	
6-8	3 5 [illegible] 7	70	NA	Dark brown, coarse SAND, some gravel, trace paper, oil sheen, wet, FILL			■		0	40	■
8-10	6 5 5 6	65	NA	Dark grey, SILT and CLAY, trace wood, oil stain, wet, FILL				■	0	30	■
10-12	5 5 6 7	75	NA	Red-brown, fine SAND and SILT, trace gravel, wet	■				0	30	
12-14	10 20 22 24	65	NA	Brown, fine SAND and SILT, trace gravel, wet	■				0	40	
14-16	15 18 22 29	40	NA	Brown, SAND and GRAVEL, some silt, wet	■				0	40	
16-18	24 38 63 80	100	NA	Brown, coarse SAND and SILT, wet	■				0	50	
18-20	90 100/2	50	NA	Brown, coarse SAND and GRAVEL, wet	■				0	30	
				AUGER REFUSAL AT 20.5 feet							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY — DEPTH (FT.): 0.0, 10.0, 14.0, 16.0, 18.0, 20.0

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2L MW 8D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 09/06/90
DATA COMPLETED: 09/12/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 87.1
PROTECTIVE CASING ELEVATION: 89.33
WELL ELEVATION: 89.33
WATER LEVEL: 0.0 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	R.T.D. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				FOR OVERBURDEN SOIL DESCRIPTION SEE BORING LOG 2LMW8S	0									0.0	GROUT; 6 IN. WELL CASING
					5										
					10										
					15										
					20										

ATLANTIC

BORING LOG 2L MW 8D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 09/06/90
DATA COMPLETED: 09/12/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 87.1
PROTECTIVE CASING ELEVATION: 89.33
WELL ELEVATION: 89.33
WATER LEVEL: 0.0 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
					26										
					31										
					36										
					41										
				BEDROCK										41.5	GROUT; 6 IN. WELL CASING

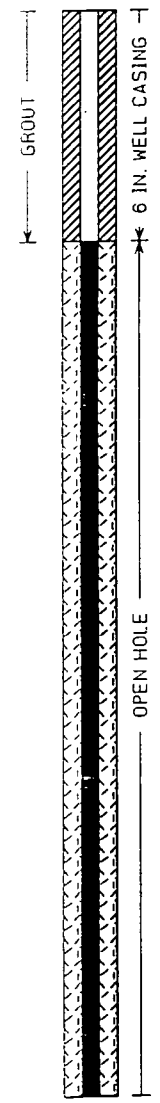
ATLANTIC

BORING LOG 2L MW 8D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 09/06/90
DATA COMPLETED: 09/12/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 87.1
PROTECTIVE CASING ELEVATION: 89.33
WELL ELEVATION: 89.33
WATER LEVEL: 0.0 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					42										GROUT; 6 IN. WELL CASING
					47										
					52										OPEN HOLE
					57										
					62										



ATLANTIC

BORING LOG 2L MW 8D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 09/06/90
DATA COMPLETED: 09/12/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 87.1
PROTECTIVE CASING ELEVATION: 89.33
WELL ELEVATION: 89.33
WATER LEVEL: 0.0 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					63										
					68										
					73										
					78										
					83										

OPEN HOLE

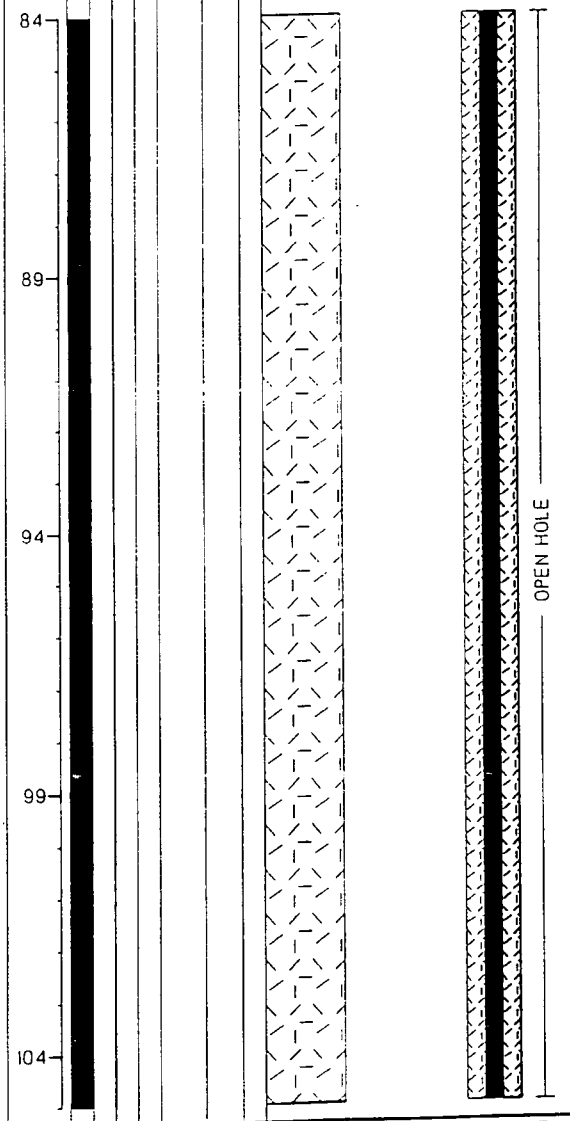
ATLANTIC

BORING LOG 2L MW 8D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 09/06/90
DATA COMPLETED: 09/12/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 87.1
PROTECTIVE CASING ELEVATION: 89.33
WELL ELEVATION: 89.33
WATER LEVEL: 0.0 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL % RAD (ppm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					84									
					89									
					94									OPEN HOLE
					99									
					104									



ATLANTIC

BORING LOG 2L MW 8D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 09/06/90
DATA COMPLETED: 09/12/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 87.1
PROTECTIVE CASING ELEVATION: 89.33
WELL ELEVATION: 89.33
WATER LEVEL: 0.0 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					105										
					110										
					115										OPEN HOLE
					120										
				END OF BORING AT 124.37 feet	125									124.4	

ATLANTIC

BORING LOG 2L MW 9S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/16/90
DATA COMPLETED: 08/17/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

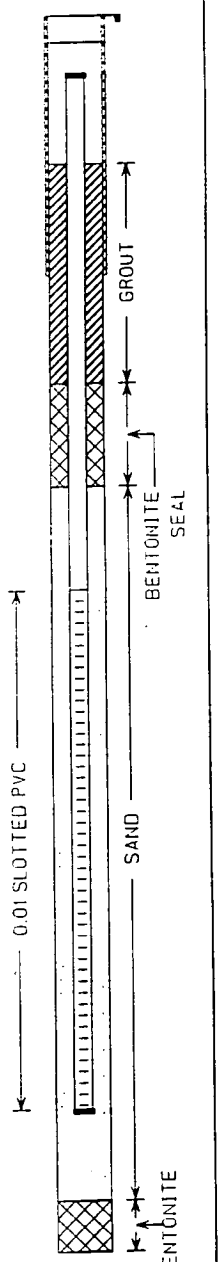
GROUND ELEVATION: 85.3
PROTECTIVE CASING ELEVATION: 88.15
WELL ELEVATION: 86.96
WATER LEVEL: 77.96 (03/21/91)
DATUM: SUBASE
WEATHER: 95°, CLEAR SKIES, VERY HUMID
INSPECTOR: MICHAEL NEJOL AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.: NONE / STAIN / SHEEN / HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	5 7 9 9	85	0.0	Brown, fine to medium SAND and GRAVEL, damp, FILL		0	40	
2-4	9 7 5 7	40	6.5	Dark brown, fine SAND and GRAVEL, trace clay, damp, FILL		0	50	
4-6	7 6 5 9	20	3.0	Brown, medium SAND and GRAVEL, moist, FILL		0	80	
6-8	5 4 4 4	35	2.8	Brown, medium to coarse SAND and GRAVEL, trace wood fragments, moist, FILL		0	60	
8-10	6 9 11 16	35	0.0	Brown, fine to medium SAND and GRAVEL, trace paper, trace glass, wet, FILL		0	80	
10-12	6 7 1 1	30	0.0	WOOD		0	60	
12-14	1 1 1 1	75	0.0	Dark grey, coarse SAND and SILT, some clay, trace wood fragments, wet, DREDGE SPOIL		0	60	
14-16	1 1 1 2	100	0.0	Grey, SILT and CLAY, trace fine sand, trace shell fragments, trace wood fragments, wet, DREDGE SPOIL		0	50	
16-18	2 1 1 2	100	NA			NA	NA	
18-20	2 1 2 2	90	0.0			0	50	
20-22	WOH WOH WOH WOH	100	0.0			0	45	

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY — DEPTH (FT.): 0.0, 12.0

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2L MW 9S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/16/90
DATA COMPLETED: 08/17/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 85.3
PROTECTIVE CASING ELEVATION: 88.15
WELL ELEVATION: 86.96
WATER LEVEL: 77.96 (03/21/91)
DATUM: SUBASE
WEATHER: 95°, CLEAR SKIES, VERY HUMID
INSPECTOR: MICHAEL NEJOL AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
20-22	WOH WOH WOH WOH				21										
22-24	WOH WOH 1 2	100	0.0							0	70				
24-26	1 2 1 2	100	0.0							0	45				
26-28	NA	100	0.0		26					0	40				
28-30	NA	100	0.0	Brown, medium SAND, trace gravel, wet Brown, medium SAND and GRAVEL, wet						0	30			27.85 28.0	
30-32	NA	60	0.0	Brown, fine SAND, some gravel, wet	31					0	50			30.0	
32-34	NA	60	0.0	Brown, SILT, some gravel, wet						0	30			32.0	
34-36	NA	65	0.0							0	45				
36-38	13 6 5 6	65	0.0	Grey-brown, SILT and CLAY, trace fine sand, trace gravel, trace wood, wet	36					0	30			36.0	
38-40	4 16 12 14	20	0.0	Brown, fine SAND and GRAVEL, wet						0	30			38.0	
40-42	6 9 4 5	45	0.0		41					0	35				NATIVE MATERIAL CAVE IN

ATLANTIC

BORING LOG 2L MW 9S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/16/90
DATA COMPLETED: 08/17/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 85.3
PROTECTIVE CASING ELEVATION: 88.15
WELL ELEVATION: 86.96
WATER LEVEL: 77.96 (03/21/91)
DATUM: SUBASE
WEATHER: 95°, CLEAR SKIES, VERY HUMID
INSPECTOR: MICHAEL NEJOL AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					42										
42-44	100/3	10	0.0	AUGER REFUSAL AT 42.5 feet						0	60			42.5	NATIVE MATERIAL CAVE IN
					47										
					52										
					57										
					62										

ATLANTIC

BORING LOG 2L MW 9D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/20/90
DATA COMPLETED: 08/29/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 85.4
PROTECTIVE CASING ELEVATION: 87.11
WELL ELEVATION: 87.11
WATER LEVEL: 26.87 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				FOR OVERBURDEN SOIL DESCRIPTION SEE BORING LOG 2LMW9S	0									0.0	GROUT; 6 IN. WELL CASING
					5										
					10										
					15										
					20										

ATLANTIC

BORING LOG 2L MW 9D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/20/90
DATA COMPLETED: 08/29/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 85.4
PROTECTIVE CASING ELEVATION: 87.11
WELL ELEVATION: 87.11
WATER LEVEL: 26.87 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
					26										
					31										GROUT; 6 IN. WELL CASING
					36										
					41									42.0	

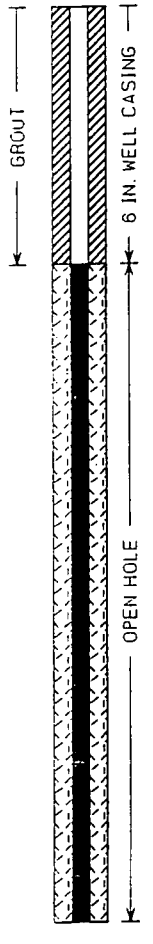
ATLANTIC

BORING LOG 2L MW 9D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/20/90
DATA COMPLETED: 08/29/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 85.4
PROTECTIVE CASING ELEVATION: 87.11
WELL ELEVATION: 87.11
WATER LEVEL: 26.87 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				BEDROCK	42										
					47										
					52										
					57										
				END OF BORING AT 59.74 feet	62									59.74	



ATLANTIC

BORING LOG 2L MW 13S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/22/90
DATA COMPLETED: 08/22/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 86.9
PROTECTIVE CASING ELEVATION: 88.80
WELL ELEVATION: 88.53
WATER LEVEL: 75.09 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, CLEAR SKIES, LIGHT WIND
INSPECTOR: MICHAEL NEJOL AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (CPM)	SAMPLE ANALYSIS
0-2	5 8 7 9	35	0.4	Brown, medium to coarse SAND and GRAVEL, damp, FILL					0	40	
2-4	22 24 22 26	100	0.0	Dark brown, SILT, some gravel, red staining, grading to moist at 6.0 feet, FILL					0	35	
4-6	24 21 17 18	100	0.0						0	50	
6-8	12 11 [illegible] 8	100	0.0						0	60	
8-10	10 11 25 28	100	NA	Grading to red, medium SAND and GRAVEL, trace silt, trace plastic, wet, FILL					NA	NA	
10-12	8 7 6 4	15	0.0	Grey-brown, SILT, trace gravel, wet, FILL					0	30	
12-14	8 9 10 12	10	0.0	Brown, fine SAND and SILT, trace black ash, wet, FILL					0	30	
14-16	3 8 27 100/1	60	0.0	Brown, SILT, some gravel, some ash, wet, FILL					0	40	
				AUGER REFUSAL AT 16.0 feet CORE from 16.0 - 36.0 feet 16.0-22.3 Orange-pink gneiss, medium to coarse grained, quartz, potassium feldspar, plagioclase with minor biotite, Mamacoke Formation							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 16.0

WELL CONSTRUCTION: GROUT; BENTONITE SEAL; 0.01 SLOTTED PVC; SAND; BENTONITE PELLETS

ATLANTIC

BORING LOG 2L MW 13S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/22/90
DATA COMPLETED: 08/22/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 86.9
PROTECTIVE CASING ELEVATION: 88.80
WELL ELEVATION: 88.53
WATER LEVEL: 75.09 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, CLEAR SKIES, LIGHT WIND
INSPECTOR: MICHAEL NEJOL AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				22.3-24.3 Light to dark grey gneiss, grading to finer grained, more biotite throughout. Mamacoke Formation	21										
				24.3-31.6 Alternating bands of light grey, white, dark grey, and light orange gneiss. Quartz, plagioclase, potassium feldspar, and biotite banding. Mamacoke Formation	26										BENTONITE PELLETS
				31.6-36.0 Light to dark grey, fine to medium grained, quartz, plagioclase, biotite gneiss. Mamacoke Formation	31										
					36									36.0	
					41										

ATLANTIC

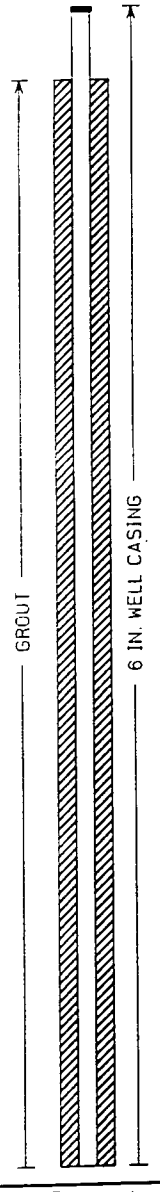
BORING LOG 2L MW 13D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/29/90
DATA COMPLETED: 08/30/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 86.8
PROTECTIVE CASING ELEVATION: 88.2
WELL ELEVATION: 88.2
WATER LEVEL: 5.4 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				FOR OVERBURDEN SOIL DESCRIPTION SEE BORING LOG 2LMW13S	0									0.0
					5									
					10									
					15									
				BEDROCK	20									19.5

WELL CONSTRUCTION



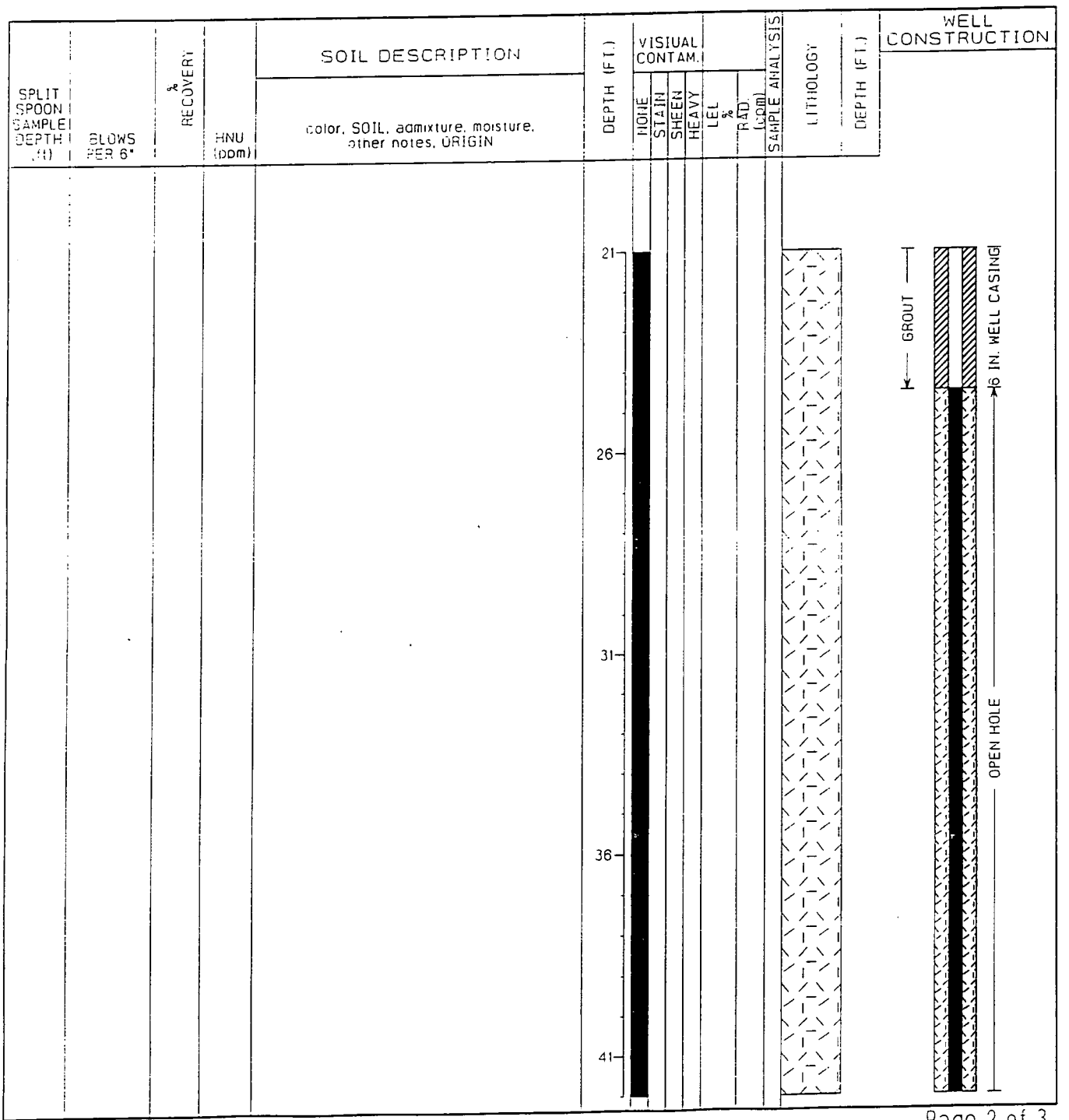
ATLANTIC

BORING LOG 2L MW 13D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/29/90
DATA COMPLETED: 08/30/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 86.8
PROTECTIVE CASING ELEVATION: 88.2
WELL ELEVATION: 88.2
WATER LEVEL: 5.4 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										GROUT; 6 IN. WELL CASING
					26										OPEN HOLE
					31										
					36										
					41										



ATLANTIC

BORING LOG 2L MW 13D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/29/90
DATA COMPLETED: 08/30/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 86.8
PROTECTIVE CASING ELEVATION: 88.2
WELL ELEVATION: 88.2
WATER LEVEL: 5.4 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					42										
					47										
					52										OPEN HOLE
					57										
				END OF BORING AT 60.03 feet	62									60.03	

ATLANTIC

BORING LOG 2L MW 14S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 07/31/90
DATA COMPLETED: 07/31/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: SCOTT METCALF
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 91.9
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 85°, CLEAR SKIES
INSPECTOR: MIKE NEJDL
CHECKED BY: CURT KRAEMER

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	9 16 26 26	70	0.0	Brown, fine to coarse SAND, trace silt, some gravel, damp, FILL					0	40			0.0	
2-4	15 8 4 8	7	0.0						0	40				
4-6	9 6 4 7	10	0.0	Brown, fine to coarse SAND and GRAVEL, trace silt, damp					0	60			4.0	
6-8	6 5 4 3	100	0.0	Brown, fine SAND and SILT, trace wood fragments, damp					0	70			6.0	
8-10	5 8 12 14	85	0.0	Brown, fine to medium SAND, little gravel, trace silt, damp					0	60			8.0	
10-12	11 40 50/5	60	0.0						0	50				
12-14	17 100	40	0.0	Brown fine to coarse SAND, little gravel, trace silt, moist					0	65			12.0	
				AUGER REFUSAL AT 13.0 feet, NO WELL INSTALLED, only indication of moisture was in bottom six inches of boring.									13.0	

DEPTH (FT.): 0, 5, 10, 15, 20

ATLANTIC

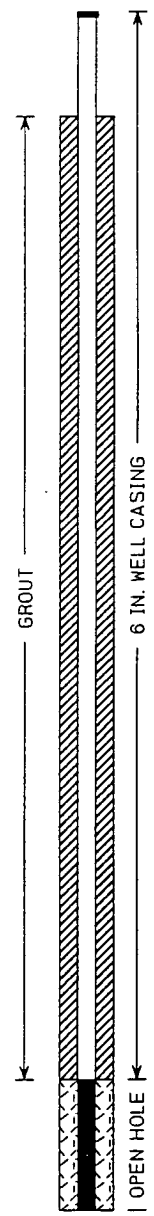
BORING LOG 2L MW 14D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/07/90
DATA COMPLETED: 08/15/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 91.9
PROTECTIVE CASING ELEVATION: 93.90
WELL ELEVATION: 93.90
WATER LEVEL: 5.23 (03/21/91)
DATUM: SUBASE
WEATHER: 85°, HOT, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				0.0-13.5 NOT SAMPLED	0									0.0
					5									
					10									
				BEDROCK										13.5
					15									
					20									

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2L MW 14D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/07/90
DATA COMPLETED: 08/15/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 91.9
PROTECTIVE CASING ELEVATION: 93.90
WELL ELEVATION: 93.90
WATER LEVEL: 5.23 (03/21/91)
DATUM: SUBASE
WEATHER: 85°, HOT, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
					26									27.0	OPEN HOLE
				END OF BORING AT 27.0 feet											
					31										
					36										
					41										

ATLANTIC

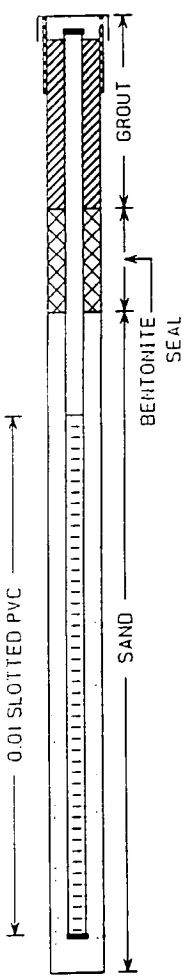
BORING LOG 2L MW 17S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/15/90
DATA COMPLETED: 08/15/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 82.48
PROTECTIVE CASING ELEVATION: 82.48
WELL ELEVATION: 82.12
WATER LEVEL: 76.23 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY SUNNY, HUMID
INSPECTOR: MICHAEL NEJDL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
0-2	15 17 12 40	65	0.1	Brown, fine SAND and GRAVEL, damp, FILL	0					0	50			0.0
2-4	50 12 7 8	40	0.1							0	50			
4-6	25 16 9 10	35	0.0	Brown, fine to medium SAND and GRAVEL, damp, FILL	5					0	50			
6-8	21 67 14 4	40	0.1	Grey-brown, fine to medium SAND and GRAVEL, moist, FILL						0	60			
8-10	7 54 38 20	30	1.0	Brown, medium SAND and GRAVEL, trace brick fragments, moist, FILL						0	60			
10-12	13 11 7 9	5	1.4	Brown, medium SAND and GRAVEL, some silt, trace paper, wet, FILL	10					0	55			
12-14	8 7 1 1	75	0.0	Grey-brown, SILT and CLAY, wet, DREDGE SPOIL						0	60			12.0
14-16	NA	75	0.0	Dark brown, SILT and CLAY, wet, DREDGE SPOIL	15					0	40			
16-18	2 1 2 1	95	0.0	Dark brown, fine SAND and SILT, trace stems and plant matter, DREDGE SPOIL						0	30			
18-20	100/6	100	0.0	Piece of weathered bedrock in end of catcher. AUGER REFUSAL AT 18.5 feet	20					0	50			18.5

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2L MW 17D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/16/90
DATA COMPLETED: 08/20/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 82.62
PROTECTIVE CASING ELEVATION: 82.37
WELL ELEVATION: 82.37
WATER LEVEL: 5.23 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY CLEAR
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				FOR OVERBURDEN SOIL DESCRIPTION SEE BORING LOG 2LMW17S	0									0.0	GROUT; 6 IN. WELL CASING
					5										
					10										
					15										
				BEDROCK	20									18.0	

ATLANTIC

BORING LOG 2L MW 17D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/16/90
DATA COMPLETED: 08/20/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 82.62
PROTECTIVE CASING ELEVATION: 82.37
WELL ELEVATION: 82.37
WATER LEVEL: 5.23 (03/21/91)
DATUM: SUBASE
WEATHER: 80°, MOSTLY CLEAR
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										GROUT
					26										6 IN. WELL CASING
					31										OPEN HOLE
					36									39.0	
				END OF BORING AT 39.0 feet	41										

ATLANTIC

BORING LOG 2L MW 18S

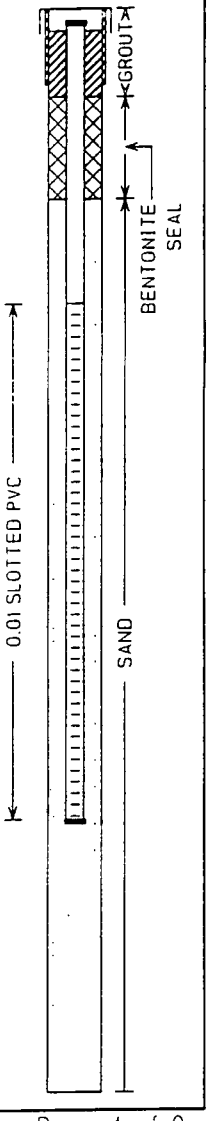
PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1056-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/03/90
DATA COMPLETED: 08/07/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: SCOTT METCALF
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 77.94
PROTECTIVE CASING ELEVATION: 77.94
WELL ELEVATION: 77.60
WATER LEVEL: 71.55 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, OVERCAST
INSPECTOR: MICHAEL NEJOL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)
0-2	22 30 29 19	50	6.1	Brown, medium SAND and GRAVEL, damp, FILL					0	120
2-4	22 45 26 12	35	0.8	Grey, medium SAND, some ash, trace wood fragments, damp, FILL					0	120
4-6	8 7 5 5	30	3.2	Brown, medium SAND and GRAVEL, trace leaves, damp, FILL					0	120
6-8	4 2 11 14	10	0.5	Brown, medium to coarse SAND and GRAVEL, moist, FILL					0	140
8-10	14 23 11 6	30	0.6	Brown, medium SAND and GRAVEL, trace paper, trace wood fragments, wet, FILL					0	150
10-12	7 14 10 8	25	0.1	Brown, medium SAND and GRAVEL, trace wood fragments, wet, FILL					0	40
12-14	NA	30	0.1	Brown, coarse SAND and GRAVEL, wet, FILL					0	35
14-16	6 2 3 3	0	NA	NO RECOVERY					NA	NA
16-18	3 2 2 2	15	0.1	Brown, fine SAND, trace gravel, wet, FILL					0	30
18-20	3 3 2 3	75	0.0	Brown, SILT and CLAY, trace wood fragments, wet, DREDGE SPOIL					0	40
20-22	2 1 3 1	75	0.4	Dark brown, SILT and CLAY, trace shell fragments, wet, DREDGE SPOIL					0	30

SAMPLE ANALYSIS — LITHOLOGY — DEPTH (FT.)

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2L MW 18S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/03/90
DATA COMPLETED: 08/07/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: SCOTT METCALF
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 77.94
PROTECTIVE CASING ELEVATION: 77.94
WELL ELEVATION: 77.60
WATER LEVEL: 71.55 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, OVERCAST
INSPECTOR: MICHAEL NEJDL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
20-22	2 1 3 1				21									22.0	SAND
22-24	2 1 2 1	0	NA	NO RECOVERY						NA	NA			24.0	
24-26	2 1 1 2	100	0.4	Dark brown, SILT and CLAY, trace shell fragments, wet, DREDGE SPOIL	26					0	37.5				
26-28	2 3 3 2	100	0.1							0	37.5				
28-30	3 4 4 4	100	0.1							0	40			29.5 30.0	
30-32	5 12 24 96	75	0.3	Dark brown, fine SAND and SILT, trace root structures, wet, TOP SOIL Brown, fine SAND and GRAVEL, trace silt, wet	31					0	40				
32-34	100/3	80	0.0	Brown, medium to coarse SAND and GRAVEL, wet AUGER REFUSAL AT 33.5 feet						0	40			33.5	
					36										
					41										

ATLANTIC

BORING LOG 2L MW 18D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/08/90
DATA COMPLETED: 08/15/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 77.67
PROTECTIVE CASING ELEVATION: 77.34
WELL ELEVATION: 77.34
WATER LEVEL: 8.55 (03/21/91)
DATUM: SUBASE
WEATHER: 80-85°, MOSTLY CLEAR, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				FOR OVERBURDEN SOIL DESCRIPTION SEE BORING LOG 2LMW18S	0									0.0	GROUT; 6 IN. WELL CASING
					5										
					10										
					15										
					20										

ATLANTIC

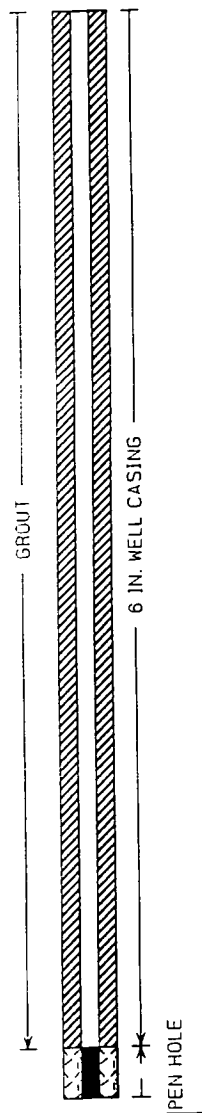
BORING LOG 2L MW 18D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1255-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/08/90
DATA COMPLETED: 08/15/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 77.67
PROTECTIVE CASING ELEVATION: 77.34
WELL ELEVATION: 77.34
WATER LEVEL: 8.55 (03/21/91)
DATUM: SUBASE
WEATHER: 80-85°, MOSTLY CLEAR, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
					21									
					26									
					31									
				BEDROCK	36									36.0
					41									

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2L MW 18D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A LANDFILL
DATE STARTED: 08/08/90
DATA COMPLETED: 08/15/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 77.67
PROTECTIVE CASING ELEVATION: 77.34
WELL ELEVATION: 77.34
WATER LEVEL: 8.55 (03/21/91)
DATUM: SUBASE
WEATHER: 80-85°, MOSTLY CLEAR, HUMID
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					42										
					47										
				END OF BORING AT 49.03 feet										49.03	OPEN HOLE
					52										
					57										
					62										

ATLANTIC

BORING LOG 2D MW 10S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 09/20/90
DATA COMPLETED: 09/20/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 52.8
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 65°, CLEAR SKIES, LIGHT WIND
INSPECTOR: MICHAEL NEJOL
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	10 15 17 29	75	0.3	Brown, fine to coarse SAND, some silt, damp	0					0	40			0.0	
2-4	3 7 17 64	25	0.3	Red-brown, fine SAND and SILT, wet at 5.0 feet						0	40			3.0	
4-5	13 4 3 4	100	0.3	AUGER REFUSAL AT 5.0 feet NO WELL INSTALLED	5					0	60			5.0	
					10										
					15										
					20										

ATLANTIC

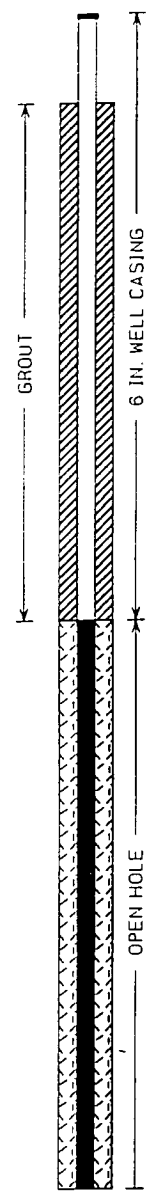
BORING LOG 2D MW 10D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 09/24/90
DATA COMPLETED: 09/25/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR-ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 52.8
PROTECTIVE CASING ELEVATION: 54.52
WELL ELEVATION: 54.52
WATER LEVEL: 10.25 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, CLEAR, COOL
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				0.0-3.5 Light brown boulders and cobbles	0									0.0
				BEDROCK	5									3.5
					10									
					15									
					20									

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2D MW 10D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 09/24/90
DATA COMPLETED: 09/25/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 52.3
PROTECTIVE CASING ELEVATION: 54.52
WELL ELEVATION: 54.52
WATER LEVEL: 10.25 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, CLEAR, COOL
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
					26									26.09	OPEN HOLE
				END OF BORING AT 26.09 feet											
					31										
					36										
					41										

ATLANTIC

BORING LOG 2D MW 11S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 08/28/90
DATA COMPLETED: 08/28/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 45.4
PROTECTIVE CASING ELEVATION: 47.77
WELL ELEVATION: 46.85
WATER LEVEL: 44.75 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, CLEAR SKIES
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS
0-2	1 1 1 1	75	0.0	Dark brown, fine SAND and SILT, trace roots, moist, TOP SOIL Light brown, fine SAND and SILT, rust colored mottling, trace roots, wet at 3.0 feet					0	30	
2-4	1 2 4 5	100	0.0						0	40	
4-6	8 11 13 18	100	0.2						0	60	
6-8	12 13 13 14	100	0.2	Grey, fine to medium SAND, some silt, rust colored mottling, wet					0	40	
8-10	8 10 12 12	100	0.2						0	40	
10-12	8 7 10 11	80	NA	Grey-brown, fine SAND and SILT, rust colored mottling, wet					NA	40	
12-14	5 9 18 16	100	0.0	Grey-brown, fine SAND and SILT, wet					0	60	
14-16	4 8 10 16	100	0.0						0	60	
16-18	35 41 100/4	75	0.0	Light brown, medium to coarse SAND, trace silt, wet AUGER REFUSAL AT 17.5 feet					0	40	

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 0.2, 6.0, 10.0, 16.0, 17.5

WELL CONSTRUCTION: GROUT, BENTONITE SEAL, 0.01 SLOTTED PVC, SAND

ATLANTIC

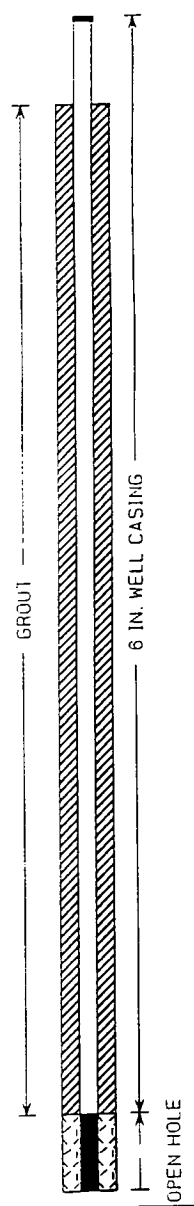
BORING LOG 2D MW 11D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 09/24/90
DATA COMPLETED: 09/25/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 51.5
PROTECTIVE CASING ELEVATION: 53.20
WELL ELEVATION: 53.20
WATER LEVEL: 7.97 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, COOL, CLEAR
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				FOR OVERBURDEN SOIL DESCRIPTION SEE BORING LOG 2DMW11D	0									0.0
					5									
					10									
					15									
				BEDROCK	20									17.0

WELL CONSTRUCTION



ATLANTIC

BORING LOG 2D MW 11D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 09/24/90
DATA COMPLETED: 09/25/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 51.5
PROTECTIVE CASING ELEVATION: 53.20
WELL ELEVATION: 53.20
WATER LEVEL: 7.97 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, COOL, CLEAR
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
				END OF BORING AT 25.55 feet	26									25.55	OPEN HOLE
					31										
					36										
					41										

ATLANTIC

BORING LOG 2D MW 15S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 09/19/90
DATA COMPLETED: 09/19/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 42.2
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 65°, OVERCAST
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	6 7 9 12	50	0.3	Dark brown, fine SAND and SILT, trace roots, damp, TOP SOIL; Brown, fine to medium SAND, some gravel, damp					0	50			0.0, 0.25, 1.0	
2-4	4 8 10 11	100	0.3	Red brown, fine SAND and SILT, moist; Grading to grey-brown color					0	60				
4-6	10 100/5	50	0.3	5.0-8.4 White to grey, fine grained gneiss, quartz, biotite, plagioclase, and potassium feldspar. Mamacoke Formation					0	50			5.0	
				8.4-12.6 Grading to dark grey, biotite rich, gneiss, occasional lenses of quartz and feldspars. Mamacoke Formation										
				12.6-23.8 White to grey, fine grained gneiss, quartz, biotite, plagioclase, and potassium feldspar. Mamacoke Formation										

DEPTH (FT.): 0, 5, 10, 15, 20

ATLANTIC

BORING LOG 2D MW 15S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 09/19/90
DATA COMPLETED: 09/19/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 42.2
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 65°, OVERCAST
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				23.8-29.0 Grey to orange-pink, fine grained gneiss, grading to more potassium feldspar than previous core sections.	21, 26									29.0	
				END OF CORE 29.0 ft.	31, 36, 41										

ATLANTIC

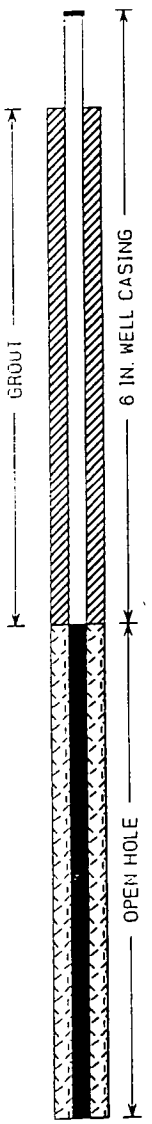
BORING LOG 2D MW 15D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 09/18/90
DATA COMPLETED: 09/19/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 42.2
PROTECTIVE CASING ELEVATION: 44.09
WELL ELEVATION: 44.09
WATER LEVEL: 5.46 (03/21/91)
DATUM: SUBASE
WEATHER: 60°, CLEAR
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				0.0-4.0 NOT SAMPLED	0									0.0
				BEDROCK	5									4.0
					10									
					15									
				END OF BORING AT 19.51 feet	20									19.51

WELL CONSTRUCTION



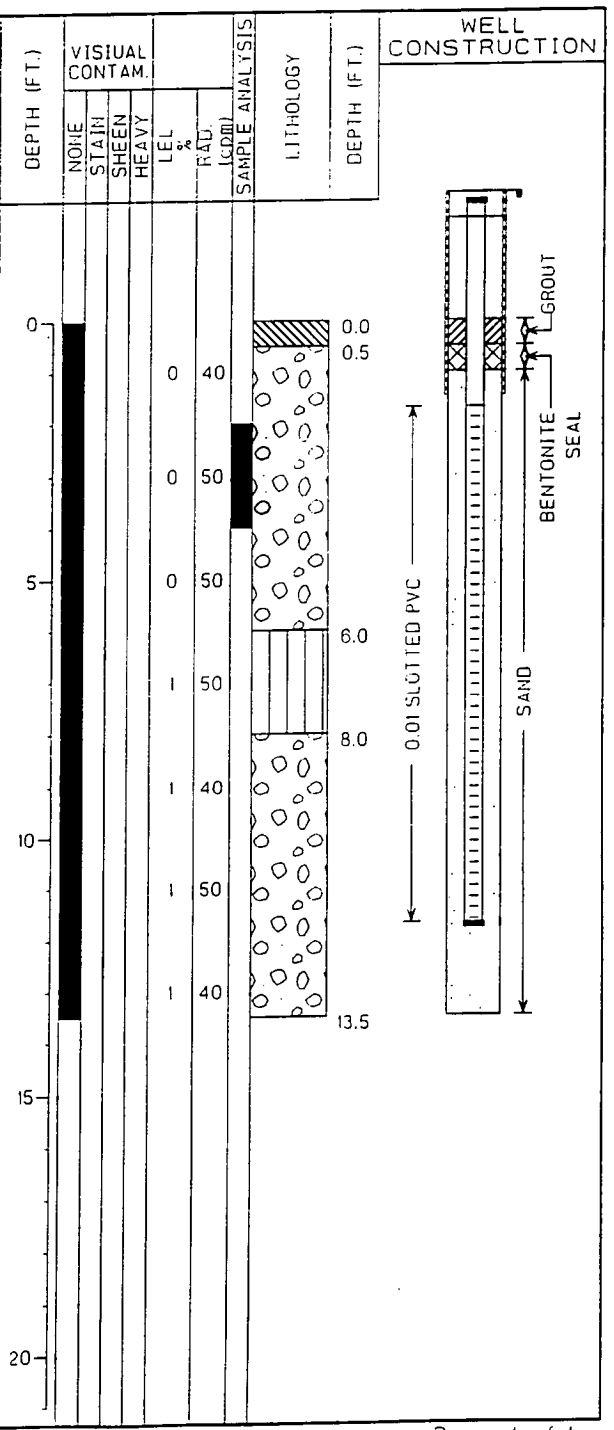
ATLANTIC

BORING LOG 2D MW 16S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 09/18/90
DATA COMPLETED: 09/19/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 35.6
PROTECTIVE CASING ELEVATION: 38.08
WELL ELEVATION: 37.85
WATER LEVEL: 34.30 (03/21/91)
DATUM: SUBASE
WEATHER: 60°, CLEAR SKIES, VERY WINDY
INSPECTOR: LYNN METCALF AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	5 7 10 11	50	0.2	Dark brown, fine SAND and SILT, trace roots, moist, TOP SOIL; Brown, medium to coarse SAND and GRAVEL, trace silt, moist					0	40	
2-4	6 9 10 11	30	0.4						0	50	
4-6	100/5	5	0.2						0	50	
6-8	26 30 13 7	50	0.2	Grey, fine to very fine SAND and SILT, wet					1	50	
8-10	6 20 31 45	60	0.2	Brown, fine to medium SAND and GRAVEL, trace silt, wet					1	40	
10-12	42 100/5	100	0.2						1	50	
12-14	100/5	100	0.2						1	40	
				AUGER REFUSAL AT 13.5 feet							



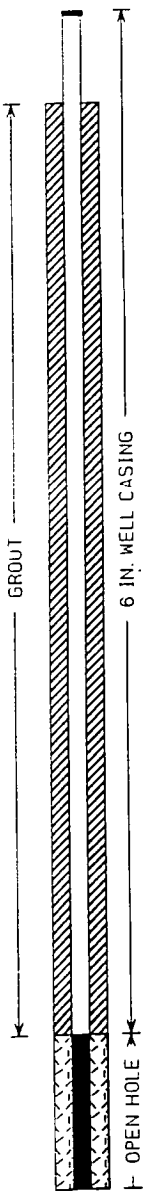
ATLANTIC

BORING LOG 2D MW 16D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 09/13/90
DATA COMPLETED: 09/18/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 35.9
PROTECTIVE CASING ELEVATION: 37.69
WELL ELEVATION: 37.69
WATER LEVEL: 3.74 (03/21/91)
DATUM: SUBASE
WEATHER: 50-60°, CLEAR SKIES
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE / STAIN / SHEEN / HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				FOR SOIL DESCRIPTION SEE BORING LOG 2DMW16S	0						0.0	
					5							
					10							
				BEDROCK							12.5	
					15							
					20							



ATLANTIC

BORING LOG 2D MW 16D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 09/13/90
DATA COMPLETED: 09/18/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 35.9
PROTECTIVE CASING ELEVATION: 37.69
WELL ELEVATION: 37.69
WATER LEVEL: 3.74 (03/21/91)
DATUM: SUBASE
WEATHER: 50-60°, CLEAR SKIES
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
					26										
					31										OPEN HOLE
					36										
					41										

ATLANTIC

BORING LOG 2D MW 16D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: AREA A DOWNSTREAM
DATE STARTED: 09/13/90
DATA COMPLETED: 09/18/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 35.9
PROTECTIVE CASING ELEVATION: 37.69
WELL ELEVATION: 37.69
WATER LEVEL: 3.74 (03/21/91)
DATUM: SUBASE
WEATHER: 50-60°, CLEAR SKIES
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: HOME	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					42										
					47										
					52										
					57										
				END OF BORING AT 59.91 feet	62									59.91	OPEN HOLE

ATLANTIC

OVER BANK DISPOSAL AREA (OBDA)

BORING LOG 3 MW 12S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: OVER BANK DISPOSAL AREA
DATE STARTED: 08/28/90
DATA COMPLETED: 08/29/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JON YEATON
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

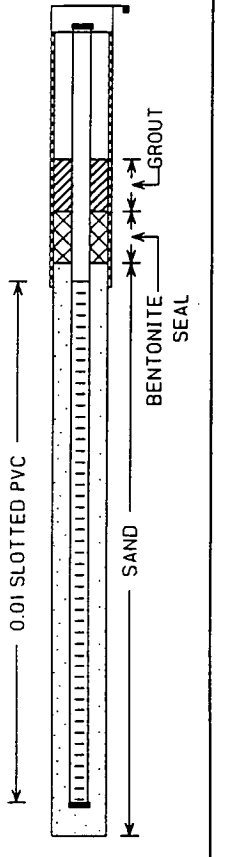
GROUND ELEVATION: 41.0
PROTECTIVE CASING ELEVATION: 43.95
WELL ELEVATION: 43.51
WATER LEVEL: 40.84 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, CLEAR SKIES
INSPECTOR: LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	1 1 2 2	30	0.0	Grey, SILT AND CLAY, light brown-yellow mottling, moist					0	40	
2-4	36 100/3	25	0.0	Grey, fine SAND and SILT, light brown-yellow mottling, boulder at 2.75 feet, damp Auger refusal at 3.0 feet, drilled with air rotary to 10.0 feet, some sand and boulders					0	40	
10-12	3 5 7 18	50	0.0	Light brown, fine SAND, 1.0 mm biotite lenses throughout, some iron staining from 11.5 to 12.0 feet					0	40	
12-14	20 79	25	0.0	Light brown, fine to medium SAND and GRAVEL, wet AUGER REFUSAL AT 13.0 feet					0	40	

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY — DEPTH (FT.): 0.0, 2.0, 2.75, 10.0, 12.0, 13.0

WELL CONSTRUCTION



ATLANTIC

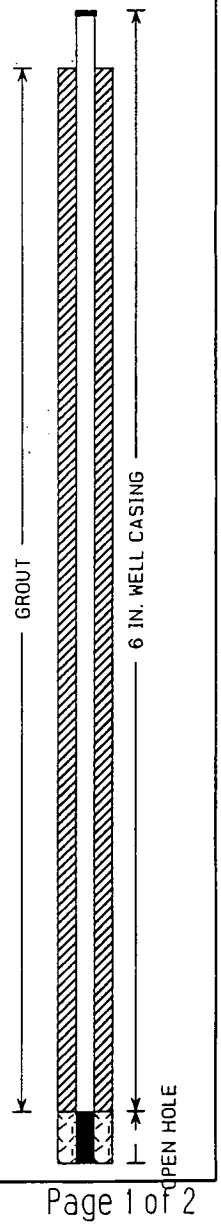
BORING LOG 3 MW 12D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: OVER BANK DISPOSAL AREA
DATE STARTED: 09/07/90
DATA COMPLETED: 09/10/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 41.10
PROTECTIVE CASING ELEVATION: 42.20
WELL ELEVATION: 42.20
WATER LEVEL: 0.5 (03/21/91)
DATUM: SUBASE
WEATHER: 70°, RAINING
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				FOR SOIL DESCRIPTION SEE BORING LOG 3MW12D	0									0.0
					5									
					10									
				BEDROCK	15									15.0
					20									

WELL CONSTRUCTION



ATLANTIC

BORING LOG 3 MW 12D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: OVER BANK DISPOSAL AREA
DATE STARTED: 09/07/90
DATA COMPLETED: 09/10/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 41.10
PROTECTIVE CASING ELEVATION: 42.20
WELL ELEVATION: 42.20
WATER LEVEL: 0.5 (03/21/91)
DATUM: SUBASE
WEATHER: 70°, RAINING
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
					26									26.1	OPEN HOLE
				END OF BORING AT 26.1 feet											
					31										
					36										
					41										

ATLANTIC

DEFENSE REUTILIZATION AND MARKETING OFFICE (DRMO)

BORING LOG 6 TB 1

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 10/11/90
DATA COMPLETED: 10/11/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RABB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 7.60
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 75°, PARTLY CLOUDY
INSPECTOR: LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	17 12 12 12	30	0	Brown, fine SAND and GRAVEL, damp					0	20	
2-4	12 16 13 21	10	0	Grey-brown, fine to medium SAND and GRAVEL, damp					0	30	
4-6	10 11 14 17	25	0	Brown, medium to coarse SAND and GRAVEL, wet					0	40	
6-8	7 6 [illegible]	0	NA	NO RECOVERY					NA	NA	
8-10	5 4 3 3	100	0	Grey, fine to medium SAND and SILT, trace wood fragments, trace shell fragments, wet					0	40	
10-12	4 4 5 2	30	0						0	35	
12-14	4 4 5 3	75	0						0	40	
14-16	5 5 4 4	75	0						0	40	
16-18	7 7 8 10	25	0	Dark grey, medium to coarse SAND and GRAVEL, trace silt					0	40	
18-20	8 10 13 21	75	0	Grading to orange-brown					0	40	
				END OF BORING AT 20.0 feet							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY — DEPTH (FT.): 0.0, 6.0, 8.0, 16.0, 20.0

WELL CONSTRUCTION

ATLANTIC

BORING LOG 6 TB 2

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 10/04/90
DATA COMPLETED: 10/04/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RABB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 7.0
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 65°, CLOUDY, WINDY
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	30 38 40 12	90	0.8	Brown, fine to coarse, SAND and GRAVEL, little silt, damp Wet at 4.0 feet	0					1	50			0.0	
2-4	25 31 22 17	80	0.8							1	50				
4-6	18 17 21 17	75	0.8	Grey, fine to medium SAND, trace gravel, wet	5					1	50			4.3	
6-8	12 8 4 3	50	1.0							1	60				
8-10	1 1 2 1	75	0.8	Black, SILT and CLAY, trace fine sand, trace wood fragments, trace shell fragments, wet						1	60			8.5	
10-12	3 3 1 1	20	0.3		10					1	50				
12-14	4 3 2 1	80	0.3							1	50				
14-16	2 4 2 1	90	1.0		15					1	60				
16-18	1 1 1 1	50	0.8							1	60				
18-20	1 1 1 10	100	0.6							1	50				
				END OF BORING AT 20.0 feet	20									20.0	

ATLANTIC

BORING LOG 6 TB 3

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 10/04/90
DATA COMPLETED: 10/05/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RABB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 6.50
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 65°, CLOUDY, WINDY
INSPECTOR: ERIK NESS AND ANNA SULLIVAN
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	10 12 14 13	75	170	Brown, fine to coarse SAND and GRAVEL, some silt, damp	0					1	40			0.0	
2-4	12 16 21 20	05	3	Dark brown, medium to coarse SAND and GRAVEL, damp						1	50				
4-6	7 9 11 10	5	3	Dark brown, medium to coarse SAND and GRAVEL, large rock fragments, wood, wet	5					1	50				
6-8	10 6 2 1	40	160	Brown, fine to coarse SAND, some gravel, some wood fragments, wet						1	40			6.0	
8-10	3 2 1 1	0	NA	NO RECOVERY						NA	NA			8.0	
10-12	2 2 1 1	0	NA		10					NA	NA				
12-14	1 1 1 1	0	NA							NA	NA				
14-16	1 1 2 17	20	50	Brown, fine to coarse SAND, some gravel, some wood fragments, wet	15					1	50			14.0	
16-18	1 1 2 3	1	50	Grey, SILT and CLAY, trace fine sand, trace shell fragments, trace wood fragments, wet						1	50			16.0	
18-20	8 4 3 1	100	30							1	30				
				END OF BORING AT 20.0 feet	20									20.0	

ATLANTIC

BORING LOG 6 TB 4

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 10/04/90
DATA COMPLETED: 10/04/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RABB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 5.60
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 65°, CLOUDY
INSPECTOR: ERIK NESS AND ANNA SULLIVAN
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	20 40 45 50	80	0.2	0.0 - 0.1 ASPHALT Brown, fine to coarse SAND and GRAVEL, some silt, some charred wood pieces FILL	0					1	50			0.0 0.1	
2-4	20 45 7 4	20	25	Brown, fine to coarse SAND and GRAVEL, some silt, wet at 4.0 feet						1	50			2.0 4.0	
4-6	9 10 6 3	0	NA	NO RECOVERY	5						NA				
6-8	3 3 3 3	75	75	Grey, SILT and CLAY, trace fine sand, trace shell fragments, oil sheen, wet						1	50			6.0 8.0	
8-10	1 1 1 2	0	NA	NO RECOVERY							NA				
10-12	2 2 1 2	50	4	Grey, SILT and CLAY, trace fine sand, trace shell fragments, oil sheen, wet	10					1	50			10.0	
12-14	1 1 1 1	90	4							1	60				
14-16	2 1 1 2	100	4		15					1	40				
16-18	2 1 1 1	50	5							1	60				
18-20	1 1 1 1	100	1							1	60				
				END OF BORING AT 20.0 feet	20									20.0	

ATLANTIC

BORING LOG 6 TB 5

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 10/03/90
DATA COMPLETED: 10/04/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RABB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 6.7
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 75°, CLEAR SKIES
INSPECTOR: ERIK NESS AND ANNA SULLIVAN
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	30 21 17 21	100	0.2	Brown, fine to coarse SAND and GRAVEL, trace silt, damp, FILL					0	40	
2-4	20 17 15 16	30	0.2	Black, coarse SAND and GRAVEL, trace silt, damp, FILL					0	50	
4-6	17 12 5 3	25	0.2	Brown, fine to coarse SAND and GRAVEL, trace silt, trace metal objects, wire, nails, etc., wet					0	40	
6-8	6 4 4 4	45	0.4	Brown, fine to coarse SAND and GRAVEL, some wood fragments, trace silt, wet					1	40	
8-10	6 20 65 8	80	0.4						1	50	
10-12	12 6 6 8	20	0.4						1	50	
12-14	8 7 7 4	100	0.4						1	40	
14-16	6 10 8 6	30	0.2						1	40	
16-18	10 100/5	50	0.2	END OF BORING AT 17.0 feet					1	50	

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 6.0, 16.0, 17.0

WELL CONSTRUCTION

ATLANTIC

BORING LOG 6 TB 6

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 09/27/90
DATA COMPLETED: 09/27/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RABB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 4.9
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 75°, CLEAR SKIES
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	25 20 17 9	100	0.2	Brown, fine to medium SAND and GRAVEL, trace silt, clay pipe, cement fragments, trace wood chips, damp, FILL					1	40			0.0	
2-4	30 31 19 25	10	0.2						1	40				
4-6	6 3 5 4	5	0.2						1	40				
6-8	6 4 [illegible]	50	0.2	Brown, fine to medium SAND and SILT, wet					1	40			6.0	
8-10	3 3 2 2	25	0.2						1	40			10.0	
				END OF BORING AT 10.0 feet										

DEPTH (FT.): 0, 5, 10, 15, 20

ATLANTIC

BORING LOG 6 TB 7

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 09/26/90
DATA COMPLETED: 09/26/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RABB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 5.9
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 65°, OVERCAST
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
0-2	24 39 68 29	60	0.2	Brown, fine to medium SAND and GRAVEL, trace metal fragments, large pieces of red brick, damp, FILL	0					1	40			0.0	
2-4	21 30 25 27	40	0.2							1	40				
4-6	4 7 100/5	100	0.2		5					1	60				
6-8	1 7 17 6	5	0.2							1	30				
8-10	1 4 6 3	50	0.2	Grey-brown, fine SAND and SILT, some clay, trace shell fragments, oil sheen, wet						1	40				
				END OF BORING AT 10.0 feet	10									10.0	
					15										
					20										

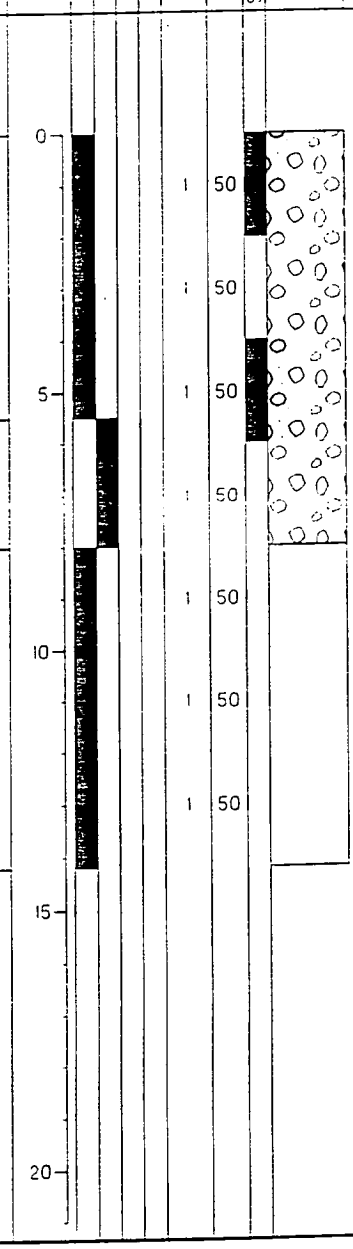
ATLANTIC

BORING LOG 6 MW 1

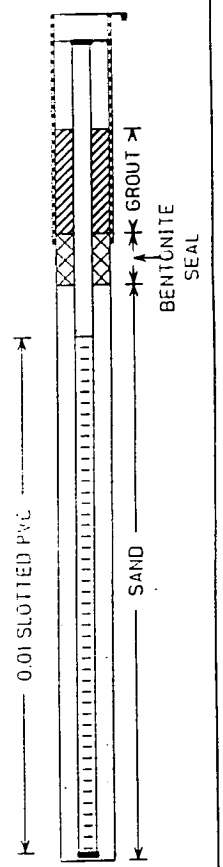
PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 10/11/90
DATA COMPLETED: 10/11/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 7.0
PROTECTIVE CASING ELEVATION: 9.21
WELL ELEVATION: 8.63
WATER LEVEL: 1.29 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, PARTLY CLOUDY
INSPECTOR: LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	1 3 3 9	90	0	Brown, fine to medium SAND and GRAVEL, trace silt, damp					1	50	
2-4	24 11 11 8	50	12						1	50	
4-6	7 9 11 17	25	0						1	50	
6-8	12 13 9 11	10	0	Brown-black, fine to medium SAND and GRAVEL, trace silt, iron staining, black staining, diesel odor, wet at 6.0					1	50	
8-10	4 5 5 6	25	0	Brown, fine SAND, some gravel, trace silt, wet					1	50	
10-12	7 6 6 8	25	0						1	50	
12-14	21 19 33 18	0	0						1	50	
14-16	100/2			END OF BORING AT 14.2 feet							



WELL CONSTRUCTION



ATLANTIC

BORING LOG 6 MW 2

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 10/09/90
DATA COMPLETED: 10/09/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

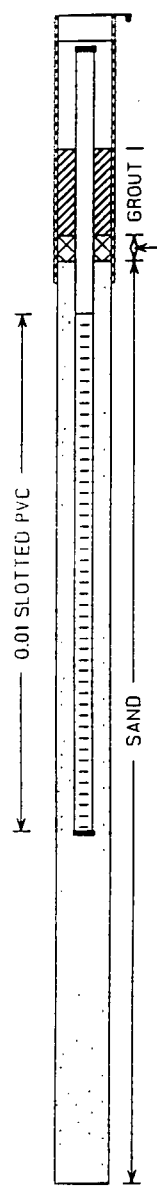
GROUND ELEVATION: 5.4
PROTECTIVE CASING ELEVATION: 8.01
WELL ELEVATION: 7.3
WATER LEVEL: 1.12 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, CLOUDY, OCCASIONAL SHOWERS
INSPECTOR: ERIK NESS AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS
0-2	13 48 36 12	75	400	Brown, organic SAND and SILT, some clay, trace roots, damp, TOPSOIL					1	40	
				Brown, fine to coarse SAND and GRAVEL, trace silt, wet at 4.0 feet							
2-4	12 10 10 7	50	1.0						1	40	
4-6	10 12 8 7	5	0.2						1	40	
6-8	4 4 4 8	20	0.2						1	40	
8-10	38 10 4 1	20	0.2	Grey-brown, fine SAND and SILT, some wood chips, trace gravel, wet					1	40	
				Grey, SILT and CLAY, some fine sand, trace shell fragments, wet							
10-12	1 1 1 1	20	0.2						1	40	
12-14	1 1 1 1	25	1.0	Dark grey, fine to coarse SAND and SILT, some wood chips, wet					1	40	
14-16	1 1 1 1	30	0.4						1	40	
16-18	1 1 1 1	20	0.2						1	40	
18-20	1 1 1 1	100	1.0	Black, SILT and CLAY, trace fine sand, trace wood chips, wet					1	40	
				END OF BORING AT 20.0 feet							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 0.1, 8.0, 8.4, 12.0, 18.0, 20.0

WELL CONSTRUCTION



ATLANTIC

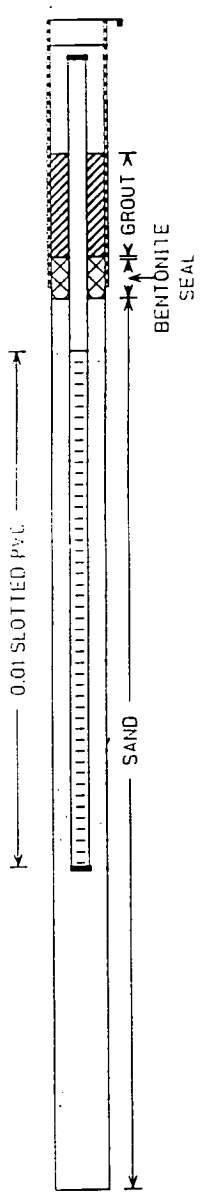
BORING LOG 6 MW 3

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 10/02/90
DATA COMPLETED: 10/02/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 4.3
PROTECTIVE CASING ELEVATION: 6.88
WELL ELEVATION: 6.10
WATER LEVEL: 1.23 (03/21/91)
DATUM: SUBASE
WEATHER: 65°, PARTLY CLOUDY
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL (%)	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
0-2	12 21 33 40	80	0.1	Brown, fine to coarse SAND and GRAVEL, trace silt, trace wood chips, trace brick fragments, wet at 2.9 feet	0					1	50			0.0
2-4	16 15 13 7	50	0.1							1	50			
4-6	8 6 6 4	40	0.2		5					1	40			
6-8	16 8 8 7	50	0.1							1	40			8.0
8-10	WOR	0	NA	NO RECOVERY						NA	NA			
10-12	WOR	0	NA		10					NA	NA			
12-14	1 1 1 7	40	0.1	Gray, SILT and CLAY, trace fine sand, trace shell fragments, diesel odor, wet						1	40			12.0
14-16	18 9 3 1	10	0.2	Grey, SILT and CLAY, trace fine sand, trace shell fragments, trace wood chips, wet	15					1	40			
16-18	18 10 1 2	50	0.4							1	50			
18-20	1 1 1 1	100	12							1	60			
				END OF BORING AT 20.0 feet	20									20.0

WELL CONSTRUCTION



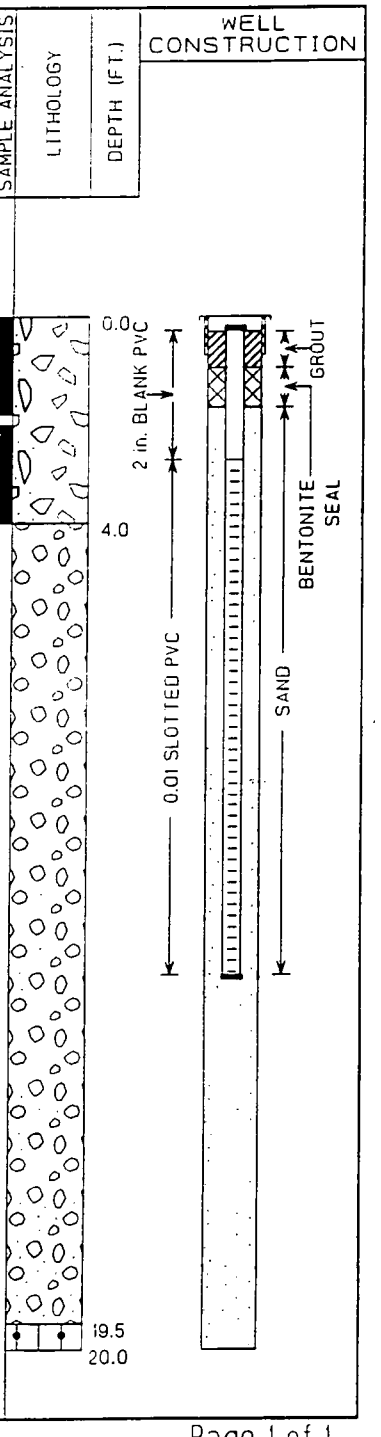
ATLANTIC

BORING LOG 6 MW 4

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 09/27/90
DATA COMPLETED: 09/27/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 5.18
PROTECTIVE CASING ELEVATION: 5.18
WELL ELEVATION: 4.9
WATER LEVEL: 1.19 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, CLEAR SKIES
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	25 30 17 12	75	0.4	0.0-0.5 ASPHALT Brown, fine to coarse SAND and GRAVEL, trace rusty metal, glass, FILL					1	40	
2-4	7 7 9 11	10	0.4						1	40	
4-6	7 7 6 9	5	0.4	Brown, fine to coarse SAND and GRAVEL, trace silt, wet at 4.0 feet					1	40	
6-8	10 11 11 15	1	0.4						1	50	
8-10	11 10 8 7	25	0.4						1	40	
10-12	1 5 3 2	10	0.4						1	40	
12-14	8 10 11 3	10	0.4						1	50	
14-16	7 9 11 4	10	0.4						1	50	
16-18	11 10 11 9	25	0.4						1	50	
18-20	4 4 4 6	0	NA						NA	NA	
				Grey, SILT and CLAY, trace fine sand, trace shell fragments, wet END OF BORING AT 20.0 feet							



ATLANTIC

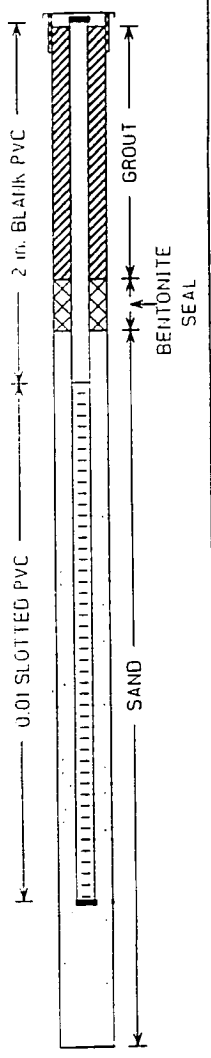
BORING LOG 6 MW 5S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 10/15/90
DATA COMPLETED: 10/16/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 14.05
PROTECTIVE CASING ELEVATION: 14.05
WELL ELEVATION: 13.88
WATER LEVEL: 3.13 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, PARTLY SUNNY
INSPECTOR: LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
0-2	9 5 7 4	75	0.6	Brown, fine to medium SAND, some gravel, trace silt, damp	0					1	40			0.0
2-4	10 10 12 18	100	0.8	Brown, fine to coarse SAND and GRAVEL, trace silt, wet at 11.0 feet						1	40			3.2
4-6	22 14 14 20	50	0.8		5					1	40			
6-8	18 21 30 35	75	0.8							1	50			
8-10	8 10 26 39	75	0.0							1	40			
10-12	19 25 75 100/5	75	0.0		10					1	40			
12-14	20 19 16 21	50	0.0							1	60			
14-16	26 24 21 30	100	0.0		15					1	60			
16-18	13 36 50 56	75	0.0							1	40			
18-20	56 72 85 70	100	0.6							1	40			
				NO RECOVERY	20									20.0

WELL CONSTRUCTION



ATLANTIC

BORING LOG 6 MW 5S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 10/15/90
DATA COMPLETED: 10/16/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 14.05
PROTECTIVE CASING ELEVATION: 14.05
WELL ELEVATION: 13.88
WATER LEVEL: 3.13 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, PARTLY SUNNY
INSPECTOR: LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
				25.5-46.5 Light to dark grey, fine to medium grained granitic gneiss, primarily quartz, plagioclase, lesser amounts of potassium feldspar, biotite, and muscovite. Granite Gneiss Member of the Sterling Plutonic Group	26									25.5	
					31										
					36										
					41										

ATLANTIC

BORING LOG 6 MW 5S

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: DRMO
DATE STARTED: 10/15/90
DATA COMPLETED: 10/16/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: JOE RAAB
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 14.05
PROTECTIVE CASING ELEVATION: 14.05
WELL ELEVATION: 13.88
WATER LEVEL: 3.13 (03/21/91)
DATUM: SUBASE
WEATHER: 75°, PARTLY SUNNY
INSPECTOR: LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					42										
					47									46.5	
					52										
					57										
					62										

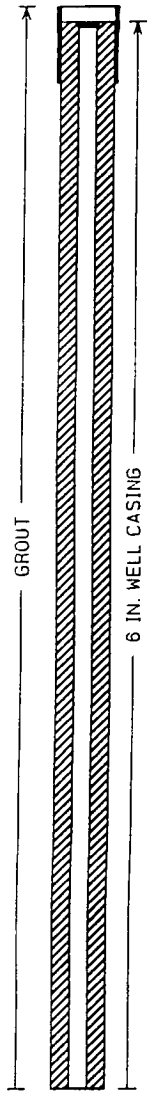
ATLANTIC

BORING LOG 6 MW 5D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: DRMO
DATE STARTED: 09/12/90
DATA COMPLETED: 09/19/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 14.23
PROTECTIVE CASING ELEVATION: 13.93
WELL ELEVATION: 13.93
WATER LEVEL: 10.75 (03/21/91)
DATUM: SUBASE
WEATHER: 60°, CLEAR SKIES
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
				FOR OVERBURDEN SOIL DESCRIPTION SEE BORING LOG 6MW5S	0									0.0	
					5										
					10										
					15										
					20										



ATLANTIC

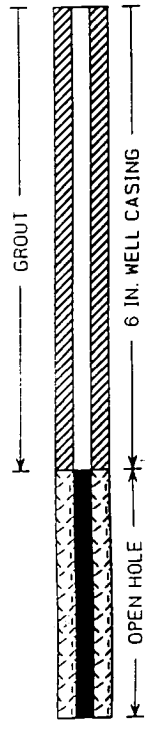
BORING LOG 6 MW 5D

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: ORMO
DATE STARTED: 09/12/90
DATA COMPLETED: 09/19/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: CRAIG CONNER
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD:

GROUND ELEVATION: 14.23
PROTECTIVE CASING ELEVATION: 13.93
WELL ELEVATION: 13.93
WATER LEVEL: 10.75 (03/21/91)
DATUM: SUBASE
WEATHER: 60°, CLEAR SKIES
INSPECTOR: AKHTER HOSSAIN AND LYNN METCALF
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
					21									
				BEDROCK	26									25.0
					31									
				END OF BORING AT 34.8 feet	36									34.8
					41									

WELL CONSTRUCTION



ATLANTIC

LOWER SUBASE

BORING LOG 13 TB 1

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/14/90
DATA COMPLETED: 11/14/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 8.0
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 35°, CLEAR SKIES, LIGHT WIND
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					0										
0-2	AUGER 25 26	10	0	Brown, fine to medium SAND and GRAVEL, some silt, damp, FILL						1	30			0.0	
2-4	40 96	10	0.4							1	40			4.0	
4-6	35 43 35 30	0	NA	NO RECOVERY	5					NA	NA				
6-8	27 29 14 16	25	55.0	WOOD CHIPS, FILL						1	50			6.0	
8-10	5 4 5 4	20	0.2	Brown, fine to coarse SAND, trace silt, trace gravel, wet						1	40			8.0	
10-12	3 9 8 3	75	0.2		10					1	40				
12-14	1 1 1 1	75	0.4							1	40			13.7	
14-16	2 3 3 2	50	0.2	Grey, fine SAND and SILT, trace clay, trace shell fragments, wet	15					1	40				
16-18	3 2 2 2	50	0.2							1	40				
18-20	2 1 2 2	100	0.2							1	40				
				END OF BORING AT 20.0 feet	20									20.0	

ATLANTIC

BORING LOG 13 TB 2

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/14/90
DATA COMPLETED: 11/14/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 7.8
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 35°, CLEAR SKIES, LIGHT WIND
INSPECTOR: CURTIS KRAEMER
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					0									0.0	
0-2	AUGER	0	NA	Brown, fine to medium SAND and GRAVEL, some silt, damp, FILL oil stain at 5.7 feet, wet						NA	NA				
2-4	10 8 9 9	40	0.0							1	30				
4-6	8 9 11 75	40	10.0		5					1	50				
6-8	13 1 1 1	25	NA	WOOD CHIPS, FILL						NA	NA			8.0	
8-10	1 2 5 9	25	3.0	Brown, medium to coarse SAND, trace silt, trace gravel, wet with oil globules						1	40				
10-12	5 5 4 3	25	5.5		10					1	40			12.0	
12-14	2 1 1 1	0	NA	NO RECOVERY						NA	NA			14.0	
14-16	1 1 1 1	50	1.0	Brown, medium to coarse SAND, trace silt, trace gravel, wet with oil globules Grey, fine SAND and SILT, trace clay, trace shell fragments, trace wood fragments, wet	15					1	40			14.5	
16-18	1 1 1 1	100	0.8							1	40				
18-20	1 1 1 1	100	1.5							1	50				
				END OF BORING AT 20.0 feet	20									20.0	

ATLANTIC

BORING LOG 13 TB 3

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/14/90
DATA COMPLETED: 11/14/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 7.9
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 40°, CLEAR SKIES, LIGHT WIND
INSPECTOR: CURTIS NICHOLS AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	AUGER 11 16	25	0.2	0.0 - 1.0 ASPHALT AND CONCRETE Brown, fine to medium SAND, some gravel, trace silt, damp, FILL					1	30	
2-4	18 15 18 33	75	3.8						1	40	
4-6	17 29 39 99	5	9.4	Oil stain					1	40	
6-8	19 5 4 3	50	8.5	Wet at 6.0 feet, oil globules in saturated zone, WOOD at 8.0 feet					1	40	
8-10	5 5 8 4	0	NA	NO RECOVERY					NA	NA	
10-12	3 3 2 1	0	NA						NA	NA	
12-14	2 2 2 2	50	4.0	Brown, medium to coarse SAND and GRAVEL, wet with oil globules					1	40	
14-16	4 5 10 6	100	6.5						1	40	
16-18	4 3 2 3	100	4.0						1	40	
18-20	1 3 1 1	100	2.5	Grey, fine SAND and SILT, trace clay, trace shell fragments, trace wood fragments, wet					1	40	
				END OF BORING AT 20.0 feet							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 1.0, 8.0, 12.0, 17.8, 20.0

WELL CONSTRUCTION

ATLANTIC

BORING LOG 13 TB 4

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/14/90
DATA COMPLETED: 11/14/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 8.3
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 45°, CLEAR SKIES, LIGHT WIND
INSPECTOR: CURTIS NICHOLS AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					0									0.0	
0-2	AUGER 8 13	25	0.1	0.0 - 1.0 ASPHALT AND CONCRETE Brown, fine to medium SAND, some gravel, trace silt, damp.						1	30			1.0	
2-4	13 13 10 9	25	0.2							1	50				
4-6	13 13 18 20	50	4.9	Rust colored stain from 4.8 - 5.0 feet	5					1	50				
6-8	10 9 8 8	0	NA	NO RECOVERY						NA	NA			6.0	
8-10	5 3 4 7	100	1.2	Brown, fine to medium SAND, some gravel, trace silt, damp.						1	50			8.0	
				Brown, fine SAND and SILT, trace gravel, wet at 8.0 feet										9.0	
10-12	11 8 9 4	50	0.5	Brown, medium to coarse SAND and GRAVEL, wet	10					1	50			10.0	
12-14	1 1 1 1	25	0.3	Grey, fine SAND and SILT, trace clay, trace shell fragments, trace wood fragments, wet 16.0 - 18.0 Slight oil sheen						1	50			11.8	
14-16	2 1 1 2	50	0.4		15					1	40				
16-18	1 1 1 1	25	0.4							1	40				
18-20	2 1 1 2	100	0.4							1	50				
				END OF BORING AT 20.0 feet	20									20.0	

ATLANTIC

BORING LOG 13 TB 5

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/14/90
DATA COMPLETED: 11/14/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 8.2
PROTECTIVE CASING ELEVATION: -
WELL ELEVATION: -
WATER LEVEL: -
DATUM: SUBASE
WEATHER: 45°, CLEAR SKIES, LIGHT WIND
INSPECTOR: CURTIS NICHOLS AND ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					0									0.0	
0-2	AUGER	0	NA	0.0 - 1.0 ASPHALT AND CONCRETE						NA	NA			1.0	
2-4	4 9 9 8	0	NA	NO RECOVERY						NA	NA			2.0	
4-6	7 4 3 3	50	0.4	Brown, fine to medium SAND and GRAVEL, trace silt, trace cobbles, moist	5					1	30			4.0	
6-8	4 8 8 6	0	NA	NO RECOVERY						NA	NA			6.0	
8-10	5 6 7 4	50	0.4	Brown, fine to medium SAND and GRAVEL, trace silt, trace cobbles, moist Oil sheen at 12.0 feet						1	30			8.0	
10-12	5 1 1 1	50	0.7		10					1	30				
12-14	1 2 3 2	75	1.5							1	30				
14-16	4 3 2 2	75	9.0	Brown, fine SAND, some gravel, oil sheen, wet	15					1	30			14.0	
16-18	2 1 1 1	100	3.0							1	30				
18-20	3 4 4 4	100	9.5	Brown, medium to coarse SAND and GRAVEL, trace silt, trace cobbles, wet						1	30			18.0	
				END OF BORING AT 20.0 feet	20									20.0	

ATLANTIC

BORING LOG 13 MW 1

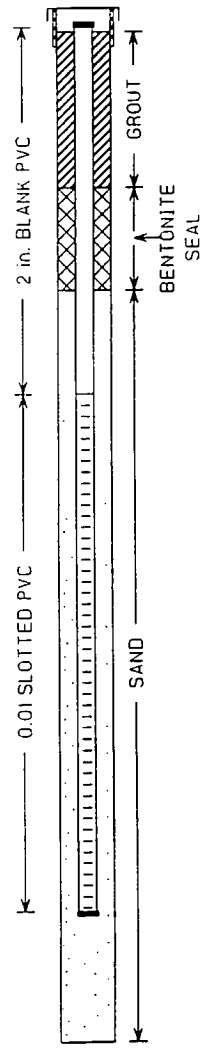
PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/05/90
DATA COMPLETED: 11/05/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 13.73
PROTECTIVE CASING ELEVATION: 13.73
WELL ELEVATION: 13.36
WATER LEVEL: 3.58 (03/21/91)
DATUM: SUBASE
WEATHER: 70°, PARTLY CLOUDY
INSPECTOR: ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
					0							
				0.0 - 0.5 ASPHALT								
0-2	AUGER 23 13	75	0.3	Brown, fine to medium SAND and SILT, trace gravel, damp						1	50	
				Light brown, fine to coarse SAND and GRAVEL, trace silt, damp								
2-4	7 8 6 7	80	1.5							1	40	
4-6	3 4 4 10	50	1.0		5					1	60	
6-8	22 18 13 10	50	0.5							1	30	
8-10	15 15 18 23	75	1.2							1	60	
				Diesel odor, wet at 10.0 feet	10							
10-12	11 17 21 27	75	15.0							1	60	
				Grading to gray color								
12-14	21 100/2	40	30.0							1	60	
14-16	17 21 32 11	50	1.0	Grading to light brown	15					1	60	
16-18	11 11 11 14	50	1.0							1	40	
				Grading to gray, fine to medium SAND at bottom of spoon								
18-20	7 20 31 45	100	3.0							1	60	
				END OF BORING AT 20.0 feet	20							

LITHOLOGY — DEPTH (FT.): 0.0, 0.5, 1.0, 20.0

WELL CONSTRUCTION



ATLANTIC

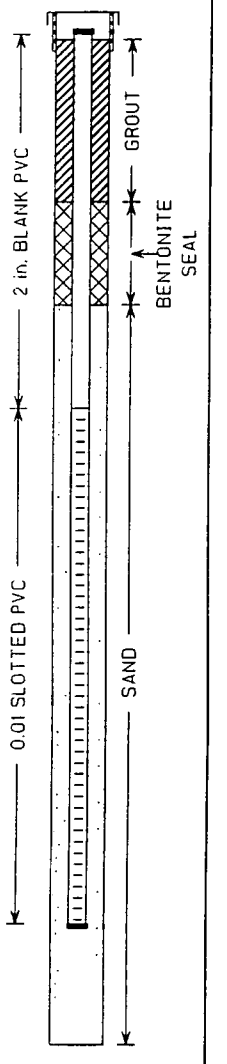
BORING LOG 13 MW 2

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/05/90
DATA COMPLETED: 11/05/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 13.23
PROTECTIVE CASING ELEVATION: 13.23
WELL ELEVATION: 12.80
WATER LEVEL: 3.59 (03/21/91)
DATUM: SUBASE
WEATHER: 70°, PARTLY CLOUDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				0.0 - 0.5 ASPHALT	0									0.0
0-2	AUGER 12 15	50	1.0	Brown, fine to coarse SAND and GRAVEL, trace silt, damp						1	40			0.5
2-4	13 10 10 11	50	1.0							1	40			
4-6	9 10 11 13	75	1.0		5					1	40			
6-8	13 13 10 12	75	1.5							1	50			
8-10	10 13 16 18	75	1.5							1	60			
10-12	7 5 4 3	50	100	Dark zone of contamination and diesel odor, wet at 10.0 feet	10					1	50			
12-14	4 6 8 8	75	110							1	40			
14-16	7 5 5 6	90	10.0	Light brown, medium to coarse SAND some gravel, trace silt, wet	15					1	30			14.0
16-18	6 6 7 8	75	7.0							1	40			
18-20	7 13 18 23	100	6.0							1	40			
				END OF BORING AT 20.0 feet	20									20.0

WELL CONSTRUCTION



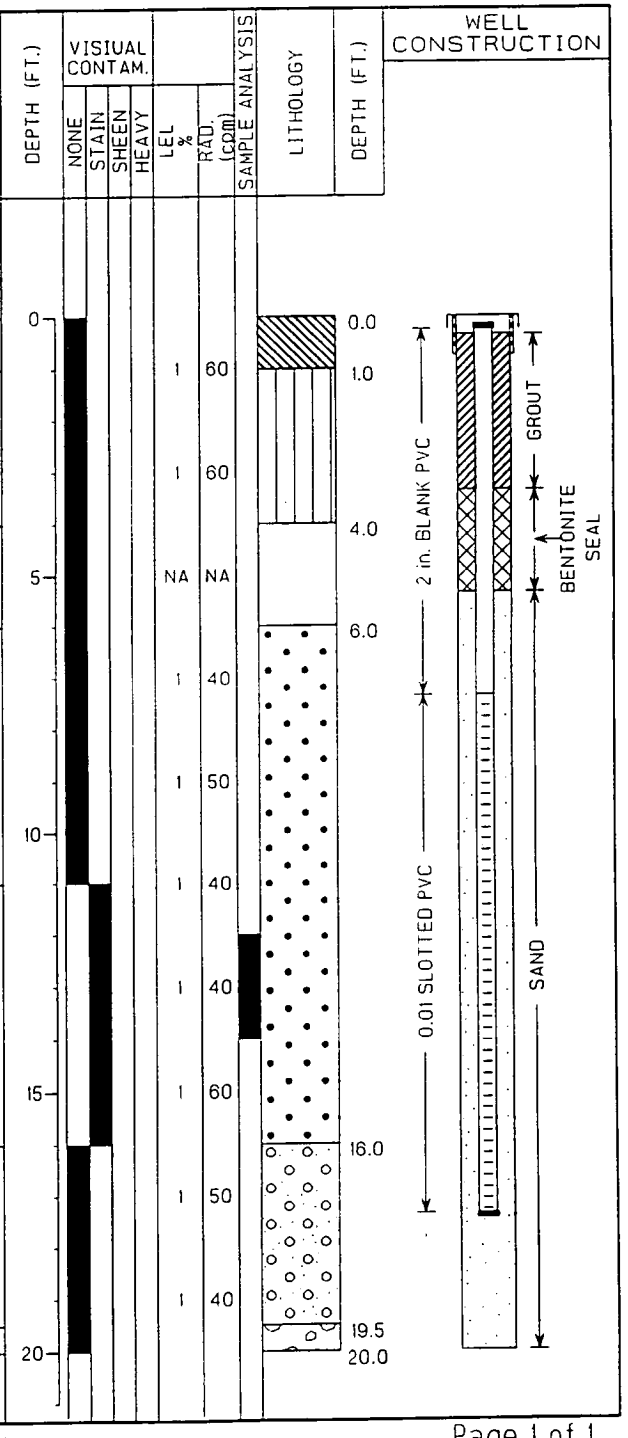
ATLANTIC

BORING LOG 13 MW 3

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/07/90
DATA COMPLETED: 11/07/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 13.15
PROTECTIVE CASING ELEVATION: 13.15
WELL ELEVATION: 12.89
WATER LEVEL: 3.56 (03/21/91)
DATUM: SUBASE
WEATHER: 45°, CLEAR SKIES
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	9 8 9 7	50	0.5	Brown, organic silt, and medium sand, trace root structures, damp TOP SOIL Brown, medium SAND and SILT, trace cobbles, damp					1	60	
2-4	6 4 4 8	30	0.5						1	60	
4-6	9 12 12 13	0	NA	NO RECOVERY					NA	NA	
6-8	3 5 5 7	40	1.0	Light brown, coarse SAND, trace silt, trace cobbles, wet at 10.0 feet					1	40	
8-10	6 7 5 6	70	15.0						1	50	
10-12	9 8 6 6	100	50.0	Dark zone of contamination and diesel odor, wet					1	40	
12-14	6 9 11 12	50	90.0						1	40	
14-16	8 9 13 12	50	50.0						1	60	
16-18	5 9 7 13	50	22.0	Light brown, fine to medium SAND, trace gravel, trace silt, wet					1	50	
18-20	11 13 14 17	100	20.0						1	40	
				Light brown, fine to medium SAND and GRAVEL, trace silt, wet END OF BORING AT 20.0 feet							



ATLANTIC

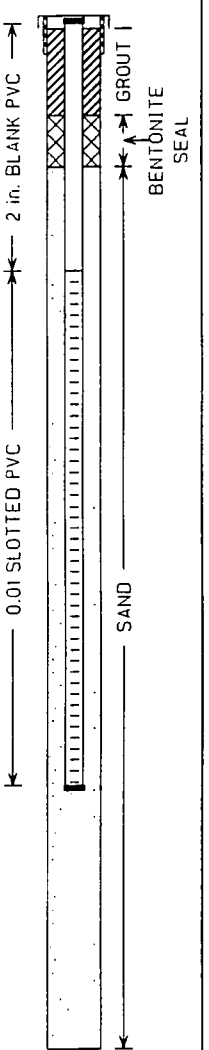
BORING LOG 13 MW 4

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/07/90
DATA COMPLETED: 11/07/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 10.29
PROTECTIVE CASING ELEVATION: 10.29
WELL ELEVATION: 10.14
WATER LEVEL: 1.88 (03/21/91)
DATUM: SUBASE
WEATHER: 50°, CLEAR SKIES
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
					0									0.0
0-2	AUGER 21 24	40	16.0	0.0 - 0.2 ASPHALT Brown, fine to coarse SAND and GRAVEL, some silt, damp, FILL						1	60			0.2
				2.0 - 2.5 ASPHALT										2.0
2-4	30 20 14 9	50	13.0	Brown, fine to coarse SAND and GRAVEL, some silt, trace cobbles, damp						1	50			2.5
4-6	9 10 8 7	50	15.0	Warm split spoon	5					1	40			
6-8	4 8 8 3	50	15.0	Wet at 6.0 feet, outside of spoon hot						1	40			
8-10	40 4 3 7	0	NA	NO RECOVERY						NA	NA			8.0
10-12	3 3 4 3	5	NA	WASH, slight oil sheen on water	10					NA	NA			
12-14	3 2 2 6	0	NA	NO RECOVERY						NA	NA			
14-16	8 10 9 10	50	10.0	Grey, medium to coarse SAND, trace silt, trace gravel, wet, (water is hot)	15					1	40			14.0
16-18	4 3 7 4	50	17.0	Grey, fine to coarse SAND and GRAVEL, trace silt, oil sheen, wet, (water is hot)						1	50			16.0
18-20	4 8 9 7	100	17.0							1	40			
				END OF BORING AT 20.0 feet	20									20.0

WELL CONSTRUCTION



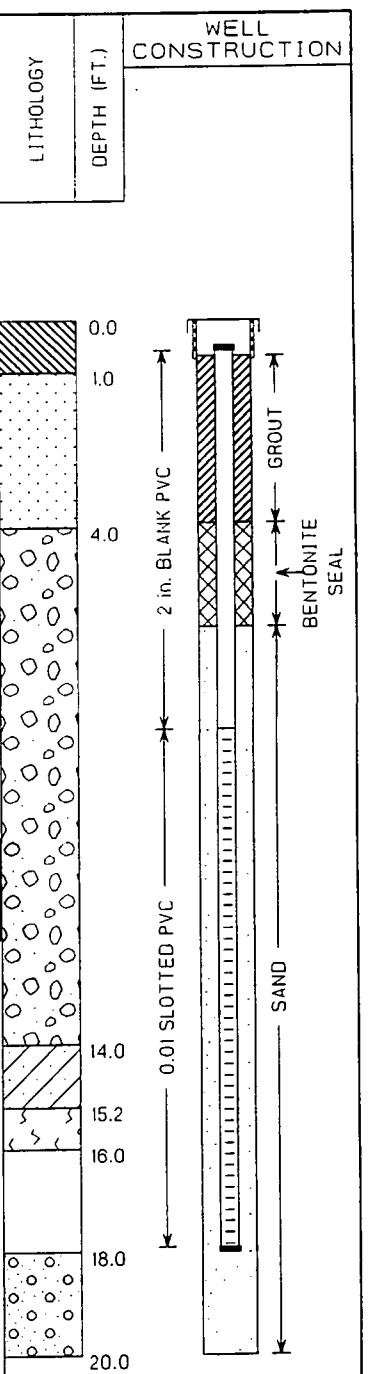
ATLANTIC

BORING LOG 13 MW 5

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/08/90
DATA COMPLETED: 11/08/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 11.72
PROTECTIVE CASING ELEVATION: 11.72
WELL ELEVATION: 11.13
WATER LEVEL: 2.17 (03/21/91)
DATUM: SUBASE
WEATHER: 40°, PARTLY CLOUDY, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	8 8 9 10	50	11.5	Brown, organic silt, medium SAND, trace root structures, damp, TOP SOIL					1	40	
				Brown, medium SAND, trace silt, trace gravel, damp							
2-4	9 11 10 12	70	13.0						1	40	
4-6	9 13 9 9	30	13.0	Brown, medium to coarse SAND and GRAVEL, some silt, trace cobbles, damp wet at 10.0 feet					1	40	
6-8	23 13 14 10	30	9.5						1	50	
8-10	13 10 15 15	40	9.0						1	40	
10-12	15 18 27 16	20	8.5						1	40	
12-14	14 17 25 25	20	8.0						1	40	
14-16	7 7 4 5	100	6.5	Grey, medium to coarse SAND, trace gravel, trace silt, wet					1	40	
				Dark brown, PEAT with roots, trace fine sand, wet							
16-18	4 3 2 3			NO RECOVERY							
18-20	3 2 1 1	0 100	NA 50.0	Grey-brown, fine to medium SAND, trace gravel, wet					1 1	NA 40	
				END OF BORING AT 20.0 feet							



ATLANTIC

BORING LOG 13 MW 6

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/13/90
DATA COMPLETED: 11/13/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

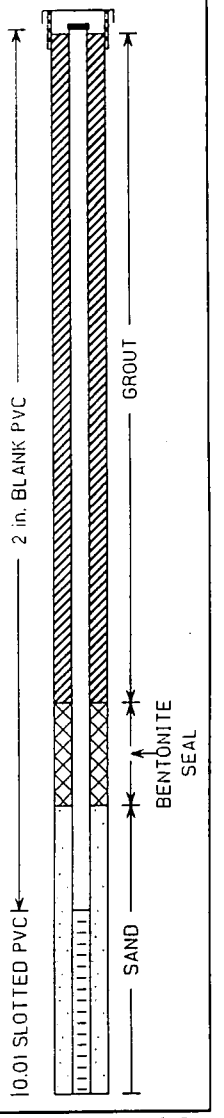
GROUND ELEVATION: 21.84
PROTECTIVE CASING ELEVATION: 21.84
WELL ELEVATION: 21.47
WATER LEVEL: 2.86 (03/21/91)
DATUM: SUBASE
WEATHER: 40°, CLEAR SKIES, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS
0-2	AUGER	0	NA	CEMENT AND ASPHALT					NA	NA	
				Brown, fine to medium SAND and GRAVEL, trace silt, damp							
2-4	18 11 12 14	100	8.0	Brown, medium to coarse SAND, some gravel, damp					1	30	
4-6	9 8 8 10	100	14.5						1	40	
6-8	8 9 10 15	75	4.5						1	40	
8-10	12 18 32 22	100	7.0						1	60	
10-12	8 8 9 8	75	30.0	Light brown, coarse SAND and GRAVEL, trace cobbles, moist					1	40	
12-14	10 10 11 11	75	15.0						1	60	
14-16	9 8 10 9	100	500						1	30	
16-18	7 8 10 10	50	20.0	Light brown, fine to medium SAND, trace gravel, wet at 18.0 feet					1	40	
18-20	7 7 10 11	100	1.0						1	40	
				AUGER TO 28.0 feet							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 1.0, 3.0, 10.0, 16.0, 20.0

WELL CONSTRUCTION



ATLANTIC

BORING LOG 13 MW 6

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/13/90
DATA COMPLETED: 11/13/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 21.84
PROTECTIVE CASING ELEVATION: 21.84
WELL ELEVATION: 21.47
WATER LEVEL: 2.86 (03/21/91)
DATUM: SUBASE
WEATHER: 40°, CLEAR SKIES, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					21										
					26										
28-30	7 4 4 5	100	0.2	Light brown, fine to medium SAND, trace gravel, wet						1	40			28.0 30.0	0.01 SLOTTED PVC SAND
				END OF BORING AT 28.0 feet	31										
					36										
					41										

ATLANTIC

BORING LOG 13 MW 7

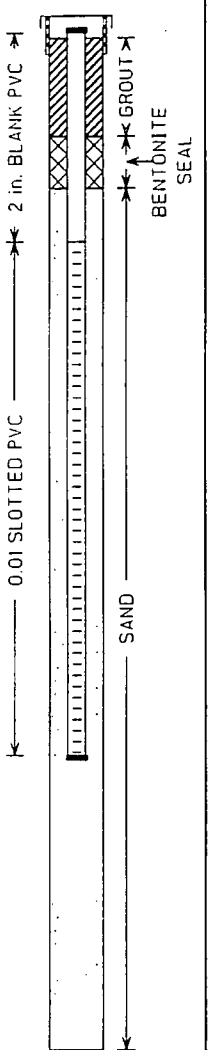
PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/07/90
DATA COMPLETED: 11/07/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 8.19
PROTECTIVE CASING ELEVATION: 8.19
WELL ELEVATION: 7.85
WATER LEVEL: 2.22 (03/21/91)
DATUM: SUBASE
WEATHER: 50°, PARTLY CLOUDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
0-2	AUGER 14 11	50	14.0	0.0 - 0.2 ASPHALT Brown, fine to coarse SAND and GRAVEL, some silt, damp.	■				1	60			0.0 0.2
2-4	10 12 13 9	0	NA	NO RECOVERY	■				NA	NA			2.0
4-6	6 5 4 3	25	13.5	Brown, fine to coarse SAND and GRAVEL, some silt, trace cobbles, damp	■				1	40			4.0
6-8	3 4 3 3	0	NA	NO RECOVERY	■				NA	NA			6.0
8-10	5 5 4 5	50	24.0	Brown, medium to coarse SAND and GRAVEL, some cobbles, grading to grey stain, diesel odor, wet at 12.0 feet		■			1	40	■		8.0
10-12	7 5 4 2	5	30.0			■			1	40			
12-14	8 7 4 2	50	25.0	Brown, medium to coarse SAND and GRAVEL, some cobbles, wet	■				1	50			
14-16	4 3 2 1	10	13.0	Grey, medium to coarse SAND, some gravel, wet	■				1	40			14.0 15.0
16-18	5 5 2 5	50	16.0	Grey, medium to coarse SAND and GRAVEL, wet	■				1	50			
18-20	3 3 2 2	90	12.0		■				1	60			19.7 20.0
				Grey, fine SAND and SILT, trace clay, trace shell fragments, trace wood fragments, wet END OF BORING AT 20.0 feet									

DEPTH (FT.): 0, 5, 10, 15, 20

WELL CONSTRUCTION



ATLANTIC

BORING LOG 13 MW 8

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/07/90
DATA COMPLETED: 11/07/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 7.80
PROTECTIVE CASING ELEVATION: 7.80
WELL ELEVATION: 7.34
WATER LEVEL: 0.99 (03/21/91)
DATUM: SUBASE
WEATHER: 50°, LIGHT CLOUD COVER
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS
0-2	1 1 1 1	40	0.3	Brown, fine to medium SAND, some gravel, damp,					1	40	
2-4	2 7 2 2	40	0.8						1	40	
4-6	1 WOH 1 1	20	15.0						1	60	
6-8	3 2 1 1	40	17.0	Wet at 6.0					1	40	
8-10	1 1 1 1	35	100	Grey zone of oil like contamination					1	40	
10-12	3 2 2 2	25	22.0						1	40	
12-14	4 7 8 8	100	20.0						1	40	
14-16	2 6 4 5	90	13.0						1	30	
16-18	6 9 8 11	100	17.0	Grey, medium to coarse SAND and GRAVEL, wet					1	40	
18-20	9 5 2 3	75	16.0						1	50	
20-22	2 1 1 2	5	15.0	Grey, fine SAND and SILT, trace shell fragments, wet					1	40	

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY / DEPTH (FT.): 0.0, 16.0, 20.0

WELL CONSTRUCTION: 2 in. BLANK PVC; 0.01 SLOTTED PVC; 2 in. BLANK PVC; BACKFILL

ATLANTIC

BORING LOG 13 MW 8

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/07/90
DATA COMPLETED: 11/07/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 7.80
PROTECTIVE CASING ELEVATION: 7.80
WELL ELEVATION: 7.34
WATER LEVEL: 0.99 (03/21/91)
DATUM: SUBASE
WEATHER: 50°, LIGHT CLOUD COVER
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
20-22	2 1 1 2				21									22.0	2 in. BLANK PVC
				AUGER TO 25.0 feet											BACKFILL
25-27	1 1 1 1	80	5.0	Grey, fine SAND and SILT, trace shell fragments, wet	26					1	60			25.0 26.0	
				END OF BORING AT 27.0 feet										27.0	
					31										
					36										
					41										

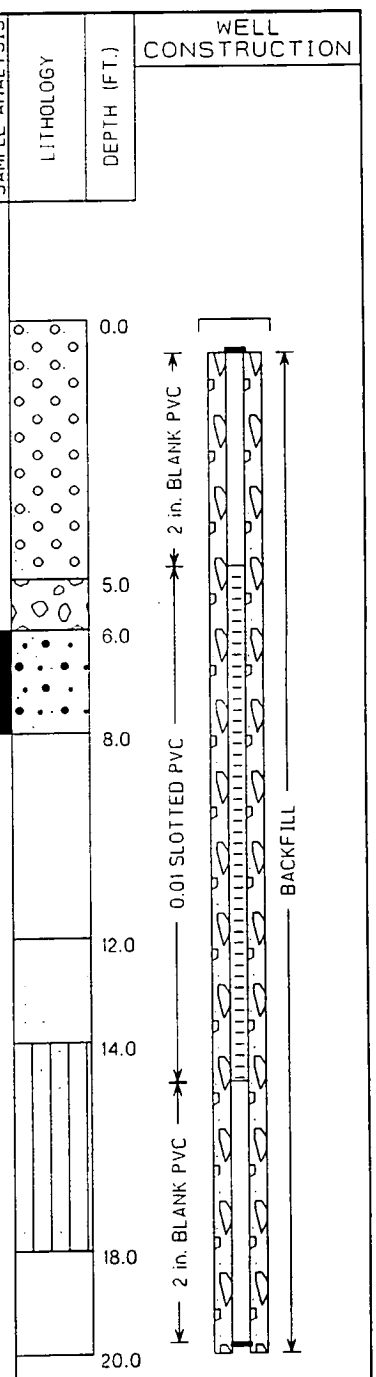
ATLANTIC

BORING LOG 13 MW 9

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/07/90
DATA COMPLETED: 11/07/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 7.57
PROTECTIVE CASING ELEVATION: 7.57
WELL ELEVATION: 6.91
WATER LEVEL: 0.76 (03/21/91)
DATUM: SUBASE
WEATHER: 50°, PARTLY CLOUDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	1 2 1 1	50	12.0	Light brown, fine to medium SAND, trace gravel, damp Wet at 4.0 feet					1	40	
2-4	1 2 2 3	50	14.0						1	50	
4-6	1 1 1 2	75	14.0	Dark brown, medium to coarse SAND and GRAVEL, trace silt, wet					1	40	
6-8	2 3 4 1	50	15.0	Light brown, fine to coarse SAND, trace gravel trace silt, wet, grading to grey color					1	40	
8-10	1 1 1 1	0	NA	NO RECOVERY					NA	NA	
10-12	3 2 1 2	0	NA						NA	NA	
12-14	6 5 1 1	25	17.0	Grey, fine SAND, some silt, trace gravel, wet					1	40	
14-16	1 1 1 1	75	15.0	Grey, fine SAND and SILT, trace shell fragments, wet					1	40	
16-18	2 1 2 1	100	13.6						1	40	
18-20	1 2 2 2	0	NA	NO RECOVERY					NA	NA	
				END OF BORING AT 20.0 feet							



ATLANTIC

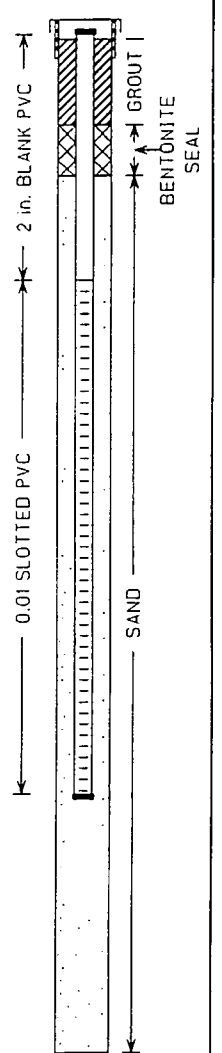
BORING LOG 13 MW 10

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/08/90
DATA COMPLETED: 11/08/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 8.73
PROTECTIVE CASING ELEVATION: 8.73
WELL ELEVATION: 8.44
WATER LEVEL: 2.17 (03/21/91)
DATUM: SUBASE
WEATHER: 40°, PARTLY CLOUDY, WINDY
INSPECTOR: CURTIS NICHOLS ERIK NESS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
0-2	AUGER			Auger to 6.0 feet to avoid driving split spoon through utility lines.	0									0.0
2-4	AUGER													
4-6	AUGER				5									
6-8	6 8 10 11	50	13.0	Light brown, fine to medium SAND, some gravel, damp						1	40			6.0
8-10	7 7 6 8	10	15.0	Brown, fine to coarse SAND and GRAVEL, some cobbles, wet at 8.0 feet						1	40			8.0
10-12	4 4 5 4	25	10.0		10					1	40			
12-14	5 4 12 37	80	15.0							1	40			
14-16	19 12 13 20	90	13.0		15					1	40			
16-18	32 11 9 9	100	12.0							1	40			
18-20	10 12 15 10	100	NA	Brown, medium to coarse SAND, some gravel, wet						NA	NA			18.0
				END OF BORING AT 20.0 feet	20									20.0

WELL CONSTRUCTION



ATLANTIC

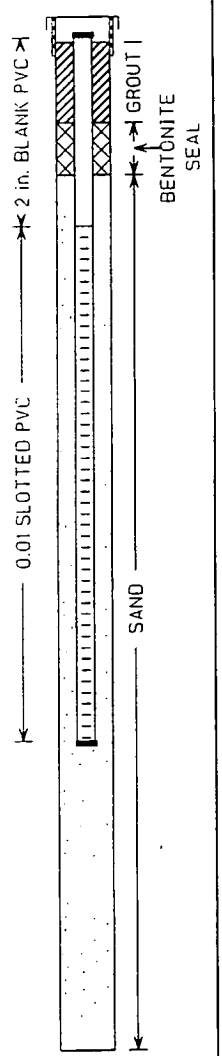
BORING LOG 13 MW 11

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/08/90
DATA COMPLETED: 11/08/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 8.23
PROTECTIVE CASING ELEVATION: 8.23
WELL ELEVATION: 7.83
WATER LEVEL: 2.13 (03/21/91)
DATUM: SUBASE
WEATHER: 45°, CLEAR SKIES, WINDY
INSPECTOR: ERIK NESS AND ROBERT PRENTISS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	DEPTH (FT.)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
0-2	15 27 17 12	60	5.0	Brown, fine to coarse SAND and GRAVEL, trace cobbles, trace silt, damp. Grading to grey and wet at 6.0 feet.	0					1	40			0.0
2-4	11 10 12 10	50	12.0							1	50			
4-6	12 9 9 13	50	11.0		5					1	30			
6-8	5 5 5 5	10	6.0							1	40			8.0
8-10	5 5 5 5	0	NA	NO RECOVERY						NA	NA			
10-12	5 5 5 3	25	5.0	Grey, medium to coarse SAND, wet	10					1	40			10.0
12-14	4 3 4 2	0	NA	NO RECOVERY						NA	NA			12.0
14-16	5 2 2 2	50	5.0	Grey, medium to coarse SAND, wet	15					1	60			14.0
16-18	4 12 13 10	100	4.0							1	40			
18-20	11 14 16 14	100	3.0							1	40			20.0
				END OF BORING AT 20.0 feet	20									

WELL CONSTRUCTION



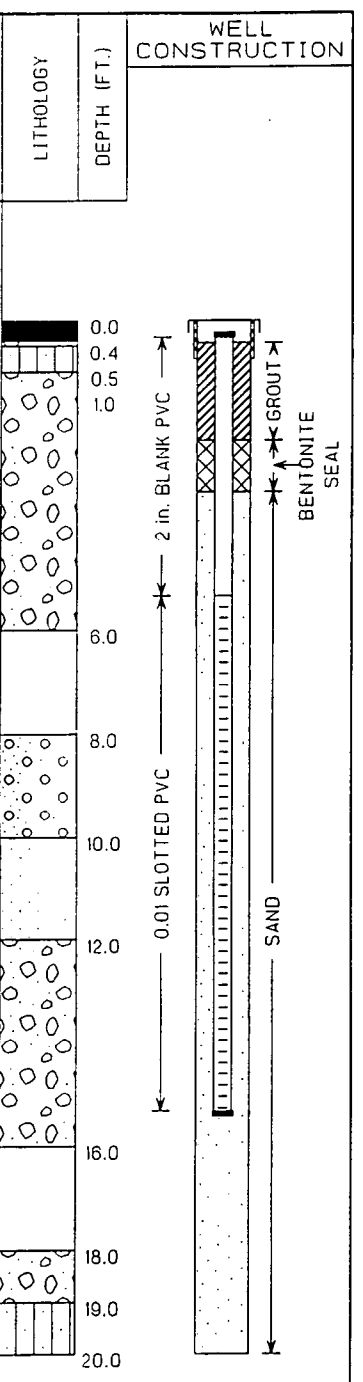
ATLANTIC

BORING LOG 13 MW 12

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/08/90
DATA COMPLETED: 11/08/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 9.55
PROTECTIVE CASING ELEVATION: 9.55
WELL ELEVATION: 9.21
WATER LEVEL: 2.92 (03/21/91)
DATUM: SUBASE
WEATHER: 45°, CLEAR SKIES, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. (NONE / STAIN / SHEEN / HEAVY)	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	AUGER 4 3	50	15.0	ASPHALT AND CONCRETE Light brown, fine to coarse SAND and GRAVEL, damp Brown, fine to medium SAND and SILT, damp	NONE	1	40	
2-4	25 16 12 11	50	20.0	Light brown, fine to medium SAND and GRAVEL, damp	NONE	1	40	
4-6	7 20 4 5	25	13.0		NONE	1	45	
6-8	3 3 2 2	0	NA	NO RECOVERY	NONE	NA	NA	
8-10	2 1 1 1	75	22.0	Grey, fine to medium SAND, some gravel, some silt, diesel odor, wet at 8.0 feet	STAIN	1	40	
10-12	WOH WOH 1 WOH	5	32.0	Grey, fine SAND, some silt, wet	NONE	1	40	
12-14	WOH WOH 3 2	100	15.0	Grey, fine to medium SAND and GRAVEL, some silt, wet	NONE	1	40	
14-16	1 2 1 1	100	16.0		NONE	1	30	
16-18	2 2 2 3	0	NA	NO RECOVERY	NONE	NA	NA	
18-20	4 4 5 7	100	20.0	Grey, fine to medium SAND and GRAVEL, some silt, wet Grey, fine SAND and SILT, trace wood fragments, trace gravel, wet END OF BORING AT 20.0 feet	NONE	1	40	



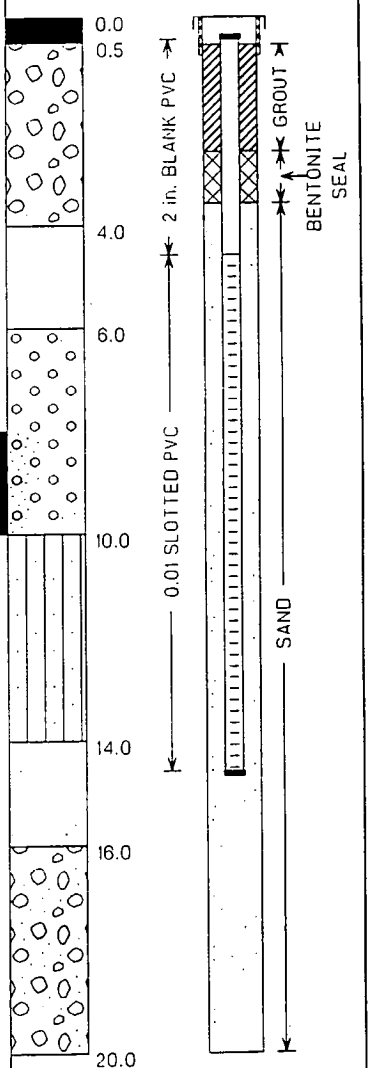
ATLANTIC

BORING LOG 13 MW 13

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/13/90
DATA COMPLETED: 11/13/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 8.94
PROTECTIVE CASING ELEVATION: 8.94
WELL ELEVATION: 8.50
WATER LEVEL: 3.03 (03/21/91)
DATUM: SUBASE
WEATHER: 40°, CLEAR SKIES, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	AUGER 7 7	40	0.2	ASPHALT AND CONCRETE Dark brown, fine to medium SAND and GRAVEL, some cobbles, damp					1	30	
2-4	7 7 7 7	40	0.2						1	30	
4-6	6 6 6 7	0	NA	NO RECOVERY					NA	NA	
6-8	17 8 8 7	40	0.5	Dark brown, fine to medium SAND, some gravel, some cobbles, wet at 8.0 feet					1	40	
8-10	8 31 17 8	50	4.0						1	40	
10-12	6 4 6 6	50	1.0	Grey, fine SAND and SILT, trace shell fragments, trace wood, wet					1	40	
12-14	4 2 1 2	50	0.5						1	40	
14-16	5 4 7 4	50	0.2	Grey, fine SAND, trace silt, trace wood, wet					1	40	
16-18	5 4 4 5	50	0.2	Light brown, fine to medium SAND and GRAVEL, trace cobbles, wet					1	50	
18-20	5 6 8 9	50	0.5						1	40	
				END OF BORING AT 20.0 feet							



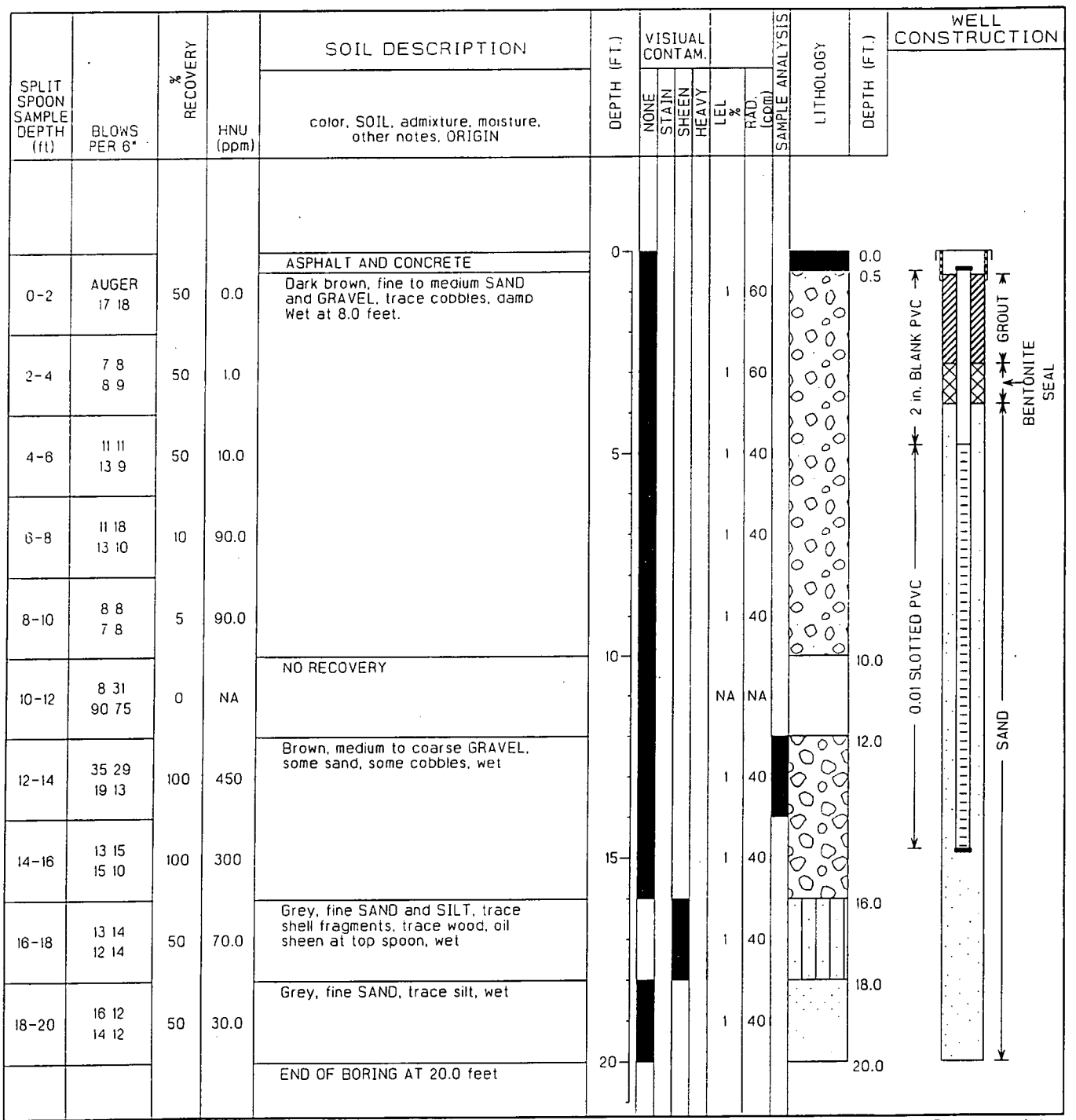
ATLANTIC

BORING LOG 13 MW 14

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/13/90
DATA COMPLETED: 11/13/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 8.48
PROTECTIVE CASING ELEVATION: 8.48
WELL ELEVATION: 7.98
WATER LEVEL: 0.45 (03/21/91)
DATUM: SUBASE
WEATHER: 45°, CLEAR SKIES, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISIUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
				ASPHALT AND CONCRETE							
0-2	AUGER 17 18	50	0.0	Dark brown, fine to medium SAND and GRAVEL, trace cobbles, damp Wet at 8.0 feet.					1	60	
2-4	7 8 8 9	50	1.0						1	60	
4-6	11 11 13 9	50	10.0						1	40	
6-8	11 18 13 10	10	90.0						1	40	
8-10	8 8 7 8	5	90.0						1	40	
10-12	8 31 90 75	0	NA	NO RECOVERY					NA	NA	
12-14	35 29 19 13	100	450	Brown, medium to coarse GRAVEL, some sand, some cobbles, wet					1	40	
14-16	13 15 15 10	100	300						1	40	
16-18	13 14 12 14	50	70.0	Grey, fine SAND and SILT, trace shell fragments, trace wood, oil sheen at top spoon, wet					1	40	
18-20	16 12 14 12	50	30.0	Grey, fine SAND, trace silt, wet					1	40	
				END OF BORING AT 20.0 feet							



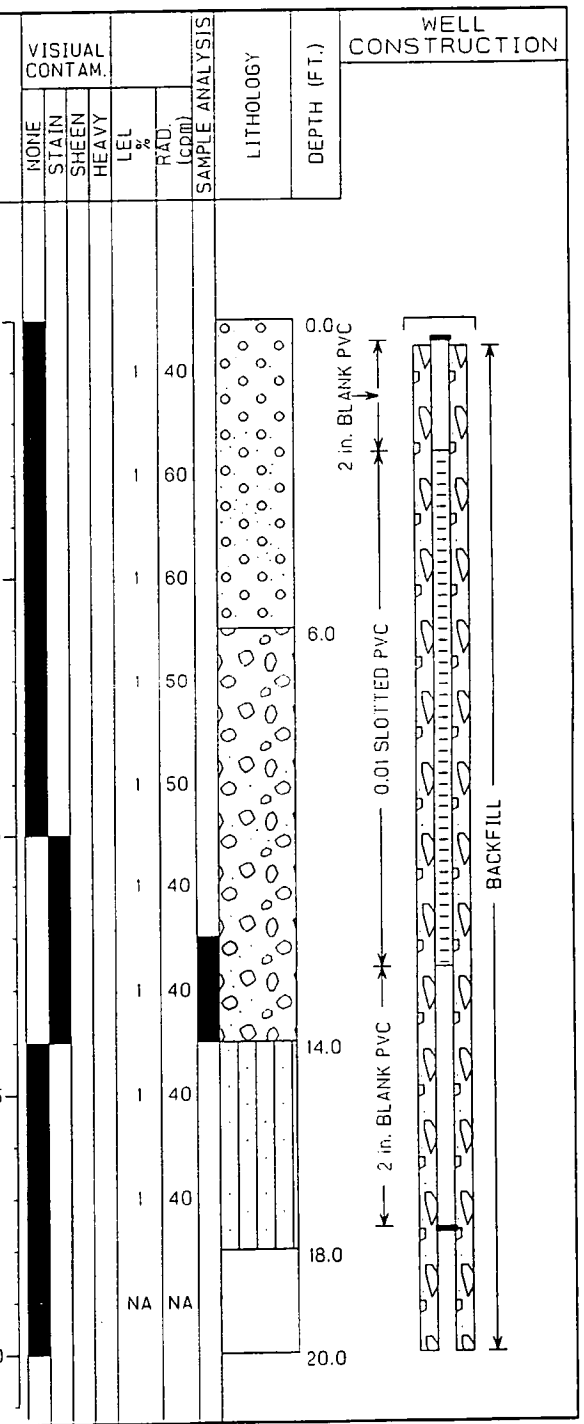
ATLANTIC

BORING LOG 13 MW 15

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/12/90
DATA COMPLETED: 11/12/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 7.70
PROTECTIVE CASING ELEVATION: 7.70
WELL ELEVATION: 7.25
WATER LEVEL: 0.30 (03/21/91)
DATUM: SUBASE
WEATHER: 45°, CLEAR SKIES, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	3 3 3	50	0.0	Light brown, fine to medium SAND, some gravel, damp					1	40	
2-4	3 7 6 7	90	0.0						1	60	
4-6	8 7 8 6	90	5.0						1	60	
6-8	4 5 7 4	50	12.0	Light brown, medium to coarse SAND and GRAVEL, wet at 6.0 feet					1	50	
8-10	8 5 6 8	50	14.0	Grading to grey					1	50	
10-12	2 1 1 1	50	16.0	Grading to dark brown stain					1	40	
12-14	1 1 1 1	50	16.0						1	40	
14-16	1 WOH WOH WOH	50	5.0	Grey, fine SAND and SILT, trace shell fragments, trace wood fragments, wet					1	40	
16-18	1 WOH 1 1	50	1.0						1	40	
18-20	1 1 1 1	0	NA	NO RECOVERY					NA	NA	
				END OF BORING AT 20.0 feet							



ATLANTIC

BORING LOG 13 MW 16

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/12/90
DATA COMPLETED: 11/12/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

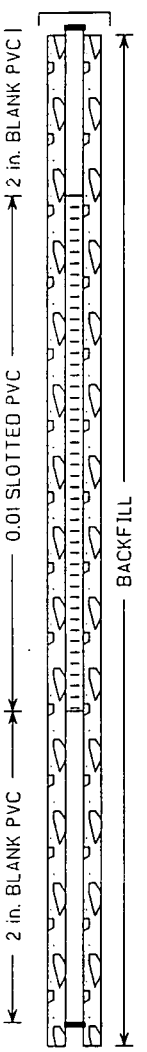
GROUND ELEVATION: 7.64
PROTECTIVE CASING ELEVATION: 7.64
WELL ELEVATION: 7.30
WATER LEVEL: 0.33 (03/21/91)
DATUM: SUBASE
WEATHER: 45°, CLEAR SKIES, VERY WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION (color, SOIL, admixture, moisture, other notes, ORIGIN)	VISUAL CONTAM. NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS
0-2	1 1 1	NA	NA	Brown, fine to medium GRAVEL, damp					NA	NA	
2-4	1 2 1 2	NA	NA	Brown, fine to medium SAND trace gravel, damp Wet at 6.0 feet					NA	NA	
4-6	3 2 2 2	NA	NA						NA	NA	
6-8	1 2 3 3	NA	NA						NA	NA	
8-10	4 3 9 11	NA	NA	Brown, coarse SAND and GRAVEL, stained, wet					NA	NA	
10-12	2 1 2 1	NA	NA						NA	NA	
12-14	1 1 1 1	NA	NA	Grey, fine SAND and SILT, trace shell fragments, trace wood fragments, wet					NA	NA	
14-16	1 1 1 1	100	5.0						1	40	
16-18	1 WOH 1 WOH	100	5.0						1	40	
18-20	1 1 1 1	100	7.0						1	40	
				END OF BORING AT 20.0 feet							

DEPTH (FT.): 0, 5, 10, 15, 20

LITHOLOGY DEPTH (FT.): 0.0, 2.0, 8.0, 12.0, 20.0

WELL CONSTRUCTION



ATLANTIC

BORING LOG 13 MW 17

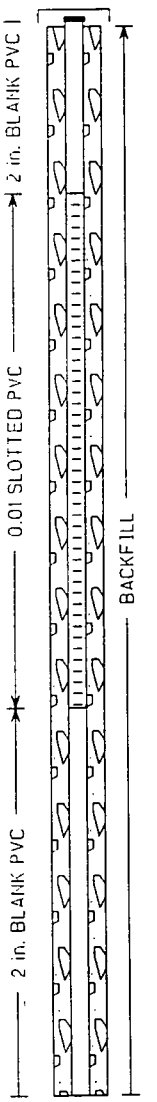
PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/12/90
DATA COMPLETED: 11/12/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 7.71
PROTECTIVE CASING ELEVATION: 7.71
WELL ELEVATION: 7.47
WATER LEVEL: 0.80 (03/21/91)
DATUM: SUBASE
WEATHER: 45°, CLEAR SKIES, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD (cpm)	SAMPLE ANALYSIS
0-2	2 2 3	50	0.2	Light brown, fine to medium SAND, some gravel, damp.	0					1	40	
2-4	3 3 4 5	75	12.0	Light brown, fine to medium SAND and GRAVEL, damp Wet at 6.0 feet.						1	40	
4-6	4 4 6 7	75	13.0		5					1	30	
6-8	5 8 6 3	95	12.0							1	40	
8-10	2 2 1 3	50	13.5	Rust brown, fine to medium SAND and GRAVEL, wet						1	40	
10-12	3 4 6 8	50	12.0	Brown, medium to coarse SAND and GRAVEL, wet	10					1	40	
12-14	6 8 7 11	75	12.0							1	40	
14-16	5 5 6 5	50	13.0	Grey, fine to medium SAND and GRAVEL, wet	15					1	40	
16-18	1 2 1 1	50	10.0							1	50	
18-20	2 1 2 3	0	NA	NO RECOVERY						NA	NA	
				AUGER TO 30.0 feet	20							

LITHOLOGY — DEPTH (FT.): 0.0, 2.0, 18.0

WELL CONSTRUCTION



ATLANTIC

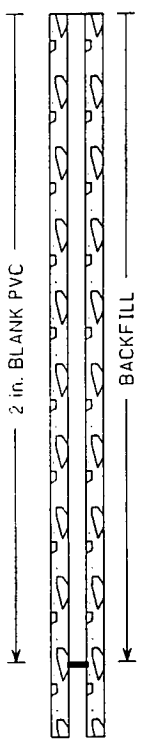
BORING LOG 13 MW 17

PROJECT: IR STUDY NSB - NLON
PROJECT NO: 1256-10
LOCATION: LOWER BASE
DATE STARTED: 11/12/90
DATA COMPLETED: 11/12/90
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS, INC.
DRILLER: TOM BROWN
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON

GROUND ELEVATION: 7.71
PROTECTIVE CASING ELEVATION: 7.71
WELL ELEVATION: 7.47
WATER LEVEL: 0.80 (03/21/91)
DATUM: SUBASE
WEATHER: 45°, CLEAR SKIES, WINDY
INSPECTOR: ERIK NESS AND CURTIS NICHOLS
CHECKED BY: ERIK NESS

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION: color, SOIL, admixture, moisture, other notes, ORIGIN	DEPTH (FT.)	VISIUAL CONTAM.: NONE	STAIN	SHEEN	HEAVY	LEL %	RAD. (cpm)	SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
					21									
					26									
30-32	5 5 5 5	100	15.0	Grey, fine to medium SAND, trace gravel, wet	31					1	50			30.0
				AUGER TO 35.0 feet										32.0
				END OF BORING AT 35.0 feet	36									35.0
					41									

WELL CONSTRUCTION



ATLANTIC

HYDRAULIC CONDUCTIVITY DATA

SLUG TEST FOR CONFINED AQUIFERS *

REFERENCE: Cooper, H. H., J. D. Bredehoeft, and S. S. Papadopulos, response of a finite-diameter well to an instantaneous charge of water, Water Resources Research, vol. 3, no. 1, pp. 263-269.

ASSUMPTIONS:
aquifer has infinite areal extent
aquifer is homogeneous, isotropic, and of uniform thickness
aquifer potentiometric surface is initially horizontal
a volume of water, V, is injected into or discharged from the well instantaneously
pumping well is fully penetrating
flow to pumping well is horizontal
aquifer is confined
flow is unsteady
water is released instantaneously from storage with decline of hydraulic head
diameter of pumping well is very small so that storage in the well can be neglected

SOLUTION:

Integral solution for dimensionless drawdown in well:

$$H/H_0 = \frac{8\alpha}{\pi^2} \int_0^\infty \frac{e^{-\beta u^2/\alpha}}{u \cdot \{[uJ_0(u)-2\alpha J_1(u)]^2 + [uY_0-2\alpha Y_1(u)]^2\}} \, du$$

Laplace solution for response in well:

$$\bar{h} = \frac{r_w \, S \, H_0 \, K_0(rq)}{T \, q \, [r_w q \, K_0(r_w q) + 2\alpha \, K_1(r_w q)]}$$

$q = (pS/T)^{1/2}$

p = Laplace transform variable

where:

H = head in well at time t [L]

H_0 = initial head in well well due to slug injection or extraction [L]

$\alpha = r_w^2 S/r_c^2$ [dimensionless]

SLUG TEST FOR CONFINED AQUIFERS
(continued)

r_w = effective radius of well [L]

r_c = internal radius of well casing [L]

β = Tt/r_c^2

J_0 = Bessel function of first kind, zero order

J_1 = Bessel function of first kind, first order

Y_0 = Bessel function of second kind, zero order

Y_1 = Bessel function of second kind, first order

K_0 = modified Bessel function of second kind, zero order

K_1 = modified Bessel function of second kind, first order

* This description of the Cooper, Bredehoeft and Papadopulos Method was extracted from Geraghty & Miller's Aqtesolv user manuel (Duffield and Rumbaugh, III, 1989)

SLUG TEST METHOD FOR UNCONFINED AQUIFERS*

REFERENCE: Bouwer, H. and R.C. Rice, 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, vol. 12, no. 3, pp. 423-428.

ASSUMPTIONS:

- aquifer is unconfined
- no delayed yield in the aquifer
- aquifer has infinite areal extent
- aquifer is homogeneous and isotropic
- flow velocity is proportional to the tangent of the hydraulic gradient
- flow is horizontal and uniform in a vertical section through the axis of the well
- diameter of the well is small so that well storage can be neglected.

SOLUTION:

$$\ln h_o - \ln h_t = \frac{2\,K\,L\,t}{r_c^2 \ln(r_e/r_w)}$$

where:

h_o = initial drawdown in well due to instantaneous removal of water from well [L]

h_t = drawdown in well at time t [L]

K = hydraulic conductivity [L/t]

L = length of well screen (including gravel pack) [L]

r_c = radius of well casing [L]

$$\ln(r_e/r_w) = \left[\frac{1.1}{\ln(H/rw)} + \frac{A+B\ln[(D-H)/rw]}{L/rw}\right]^{-1} \quad if\ D \neq H$$

$$\ln(r_e/r_w) = \left[\frac{1.1}{\ln(H/rw)} + \frac{C}{L/rw}\right]^{-1} \quad if\ D=H$$

A, B and C = dimensionless coefficients that are a function of L/rw and are determined from tables provided in Bouwer and Rice (1976).

SLUG TEST METHOD FOR UNCONFINED AQUIFERS
(continued)

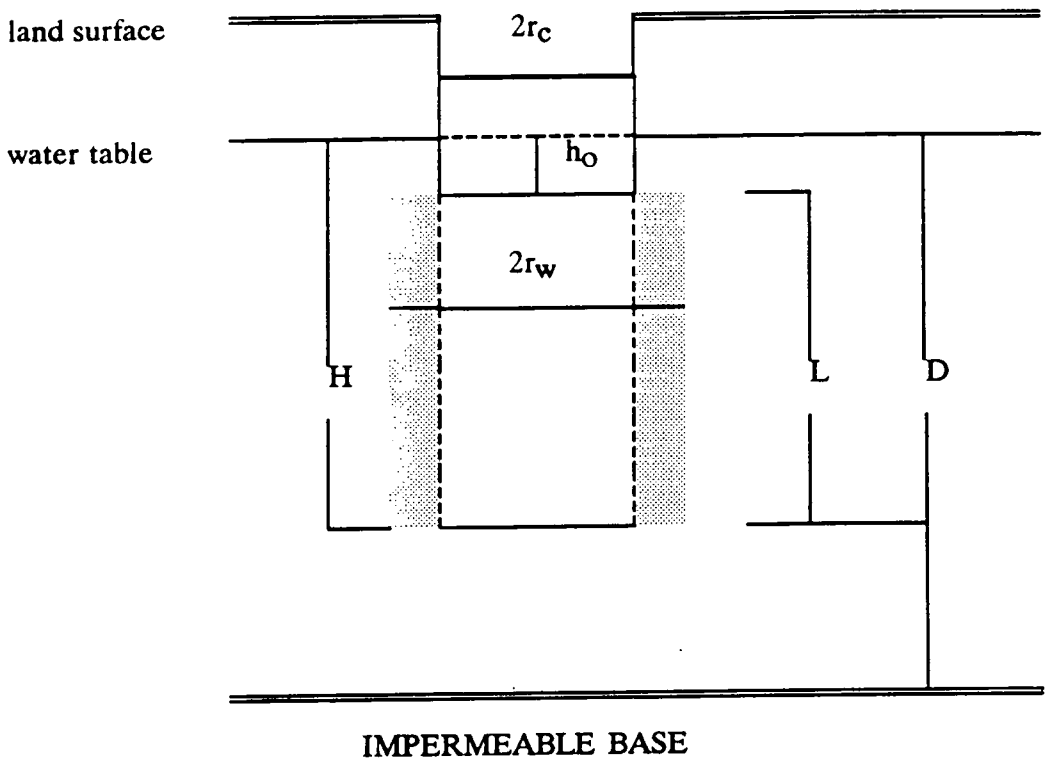
r_e = equivalent radius over which head loss occurs [L]

r_w = radius of well (including gravel pack) [L]

H = static height of water in well [L]

D = saturated thickness of aquifer

DEFINITION OF TERMS:



* This description of the Bouwer and Rice Method was extracted from Geraghty and Miller's Aqtesolv User Manual (Duffield and Rumbaugh, III, 1989).

UNSTEADY FLOW TO A WELL IN A CONFINED AQUIFER MODIFIED METHOD

REFERENCE: Cooper, H.H. and C.E. Jacob, 1946. A generalized graphical method for evaluating formation constants and summarizing well field history, Am. Geophys. Union Trans., vol. 27, pp. 526-534.

ASSUMPTIONS:

- aquifer has infinite areal extent
- aquifer is homogeneous, isotropic, and of uniform thickness
- aquifer water table surface is initially horizontal
- pumping rate is constant
- pumping well is fully penetrating
- aquifer is confined - can be used for unconfined aquifers if drawdown is small so that flow to pumping well is horizontal and water is released instantaneously from storage with decline of hydraulic head
- flow is unsteady
- diameter of pumping well is very small so that storage in the well can be neglected
- values of u are small (i.e., r is small and t is large)

SOLUTION:

The Cooper-Jacob method is a modification of the Theis (1935) method for confined aquifers.

$s = Q / (4 \pi T) w(u)$

where:
s = drawdown [L]
Q = discharge [L^3/t]
T = Transmissivity [L^2/t]
w(u) = well function

If a graph is made where drawdown is plotted on the y-axis (linear) and time is plotted on the x-axis (logarithmic), and a best-fit straight line is fitted to the data points, transmissivity can be calculated by the following equation:

$$T = \frac{264Q}{\Delta s}$$

where:
T = transmissivity [gpd/ft]
Q = discharge (gpm)
Δs = change in drawdown over one log cycle

VARIABLES USED TO ESTIMATE HYDRAULIC CONDUCTIVITY AND TRANSMISSIVITY

Well Number	Variables Measured in Feet						Remarks
	r_c	r_w	H	L	D	h_o	
	Torpedo Shops						
7MW1	0.25	0.25	36.06	11	150	0.86	Bedrock
7MW2	0.19	0.33	6.1	9	7.91	1.19	Overburden
	Goss Cove Landfill						
8MW1S	0.19	0.33	9.74	12	11.83	0.08	Overburden
8MW3S	0.19	0.33	8.4	12	12.25	0.46	Overburden
8MW4S	0.19	0.33	7.7	12	11.93	0.34	Overburden
	Area A Wetland						
2WMW3S	0.083	0.33	14.82	12	33.86	2.31	Overburden
2WMW5S	0.083	0.33	12.37	12	26.1	1.65	Overburden
2WMW1D	0.25	0.25	108	91	150	0.93	Bedrock
2WMW2D	0.25	0.25	24.45	44.93	150	2.4	Bedrock
2WMW3D	0.25	0.25	120.65	49.12	150	0.84	Bedrock
2WMW6	0.25	0.25	37.8	30.53	150	3.12	Bedrock
	Area A Landfill						
2LMW7S	0.083	0.33	12.64	12	24.46	2.43	Overburden
2LMW8S	0.083	0.33	14.9	12	19.6	1.93	Overburden
2LMW7D	0.25	0.25	39.7	10.09	150	0.85	Bedrock
2LMW18D	0.25	0.25	40.25	8.03	150	0.94	Bedrock
	Area A OBDA						
3MW12S	0.083	0.33	12.24	12	12.9	2.75	Overburden
	Area A Downstream						
2DMW16S	0.19	0.33	9.07	12	11.32	1.96	Overburden
2DMW10D	0.25	0.25	16.72	16.09	150	0.84	Bedrock
2DMW16D	0.25	0.25	0.9	47.41	150	0.9	Bedrock
	DRMO						
6MW2**	0.083	0.33	8.86	12	13.91	0.3	Overburden
6MW4S	0.19	0.33	9.03	12	16.03	0.06	Overburden
6MW5S	0.19	0.33	5.53	12	13.54	1.51	Overburden
6MW5D	0.25	0.25	22.93	9.58	150	2.57	Bedrock
	Lower Subase						
13MW6	0.19	0.33	8.61	12	9.16	0.36	Overburden
13MW7	0.19	0.33	9.5	12	15.51	0.45	Overburden
13MW10	0.19	0.33	9.21	12	14.46	1.43	Overburden
13MW11	0.19	0.33	8.7	12	15.05	1.07	Overburden
13MW12	0.19	0.33	8.35	12	11.3	2.06	Overburden
13MW13	0.19	0.33	8.35	12	14.29	1.55	Overburden
13MW14	0.19	0.33	9.7	12	15.39	0.3	Overburden

NOTES

All variables are defined on a preceding page discussing the Bouwer and Rice Method.

* - r_c value adjusted according to the following equation:

$$r_c = [r_c^2 + n(r_w^2 - r_c^2)]^{1/2}$$

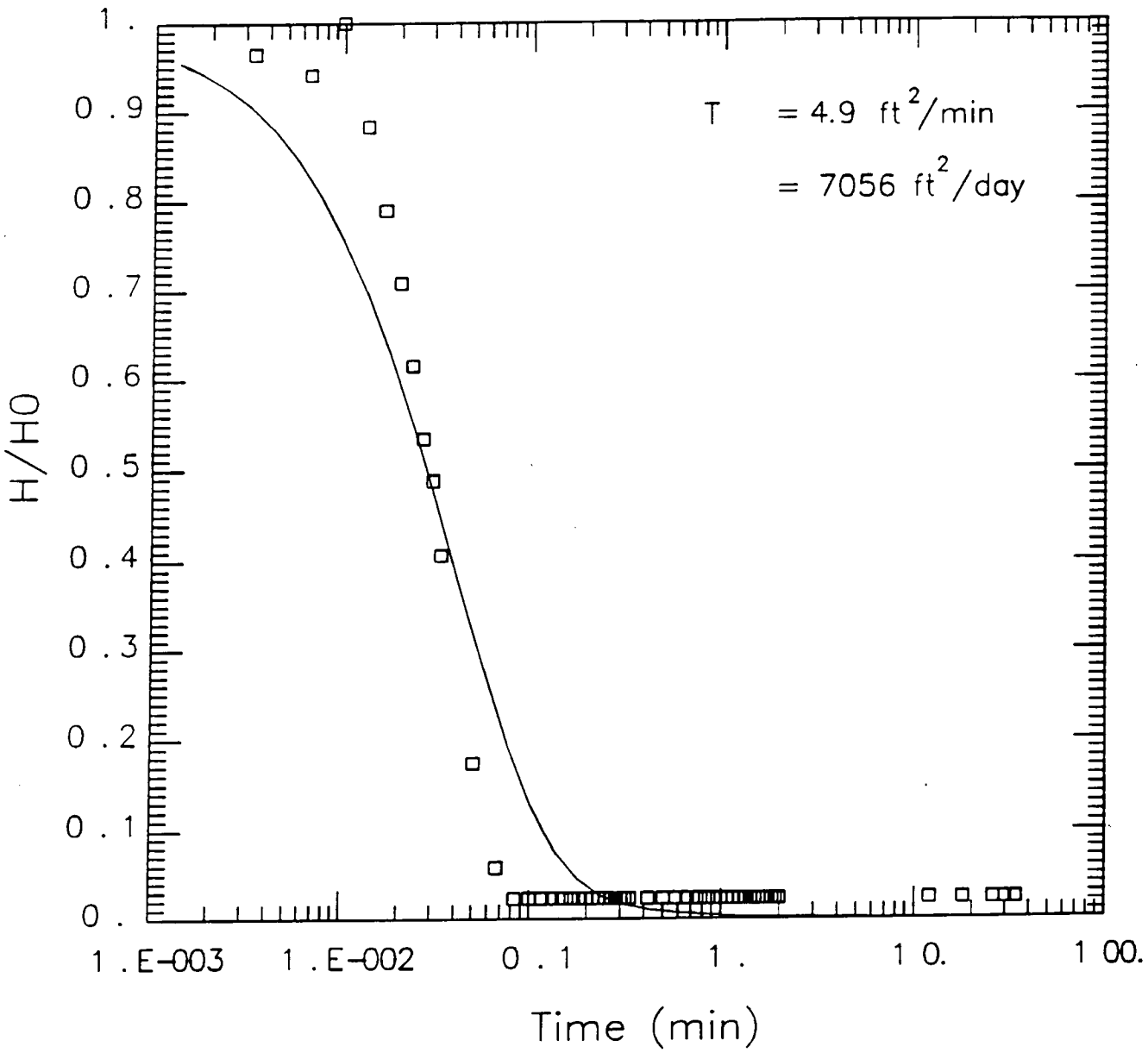
$$n = \text{porosity}$$

because the water level was within the screened interval during the slug displacement test.

**-6MW2 was analyzed using Cooper and Jacob (1946).

TORPEDO SHOP

Slug Extraction Well 7-MW-1



SE1000B
Environmental Logger
03/07 14:57

Unit# 01027 Test# 1

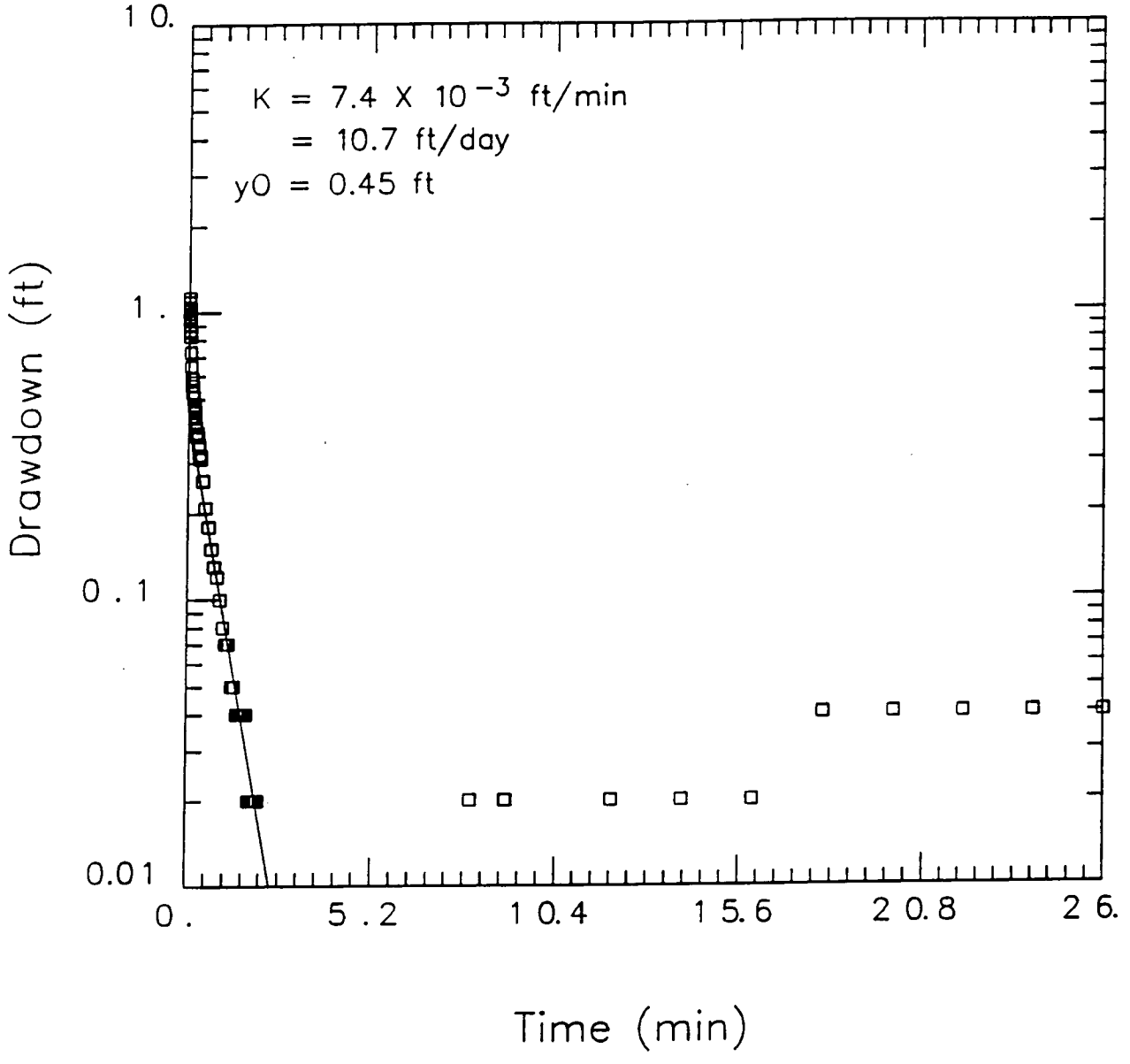
INPUT 1: Level (F)

Reference	15.97
Scale factor	50.22
Offset	0.00

Step# 0 03/07 10:02

Elapsed Time	Value
0.0000	15.19
0.0033	15.14
0.0066	15.16
0.0099	15.11
0.0133	15.21
0.0166	15.29
0.0200	15.36
0.0233	15.44
0.0266	15.51
0.0300	15.55
0.0333	15.62
0.0500	15.82
0.0666	15.92
0.0833	15.95
0.1000	15.95
0.1166	15.95
0.1333	15.95
0.1500	15.95
0.1666	15.95
0.1833	15.95
0.2000	15.95
0.2166	15.95
0.2333	15.95
0.2500	15.95
0.2666	15.95
0.2833	15.95
0.3000	15.95
0.3166	15.95
0.3333	15.95
0.4167	15.95
0.5000	15.95
0.5833	15.95
0.6667	15.95
0.7500	15.95
0.8333	15.95
0.9167	15.95
1.0000	15.95
1.0833	15.95
1.1667	15.95
1.2500	15.95
1.3333	15.95
1.4166	15.95
1.5000	15.95
1.5833	15.95
1.6667	15.95
1.7500	15.95
1.8333	15.95
1.9167	15.95
2.0000	15.95
2.5000	15.97
3.0000	15.97
3.5000	15.97
4.0000	15.97
4.5000	15.97
5.0000	15.97
5.5000	15.97
6.0000	15.97
6.5000	15.97
7.0000	15.97
7.5000	15.97
8.0000	15.97
8.5000	15.97
9.0000	15.97
9.5000	15.97
10.0000	15.97
12.0000	15.95
14.0000	15.97
16.0000	15.97
18.0000	15.95
20.0000	15.97
22.0000	15.97
24.0000	15.97
26.0000	15.95
28.0000	15.97
30.0000	15.95
32.0000	15.97
34.0000	15.95
36.0000	15.97
38.0000	15.97
40.0000	15.97

Slug Extraction Well 7-MW-2



SE1000B
Environmental Logger
03/07 14:56

Unit# 01027 Test# 0

INPUT 1: Level (F)

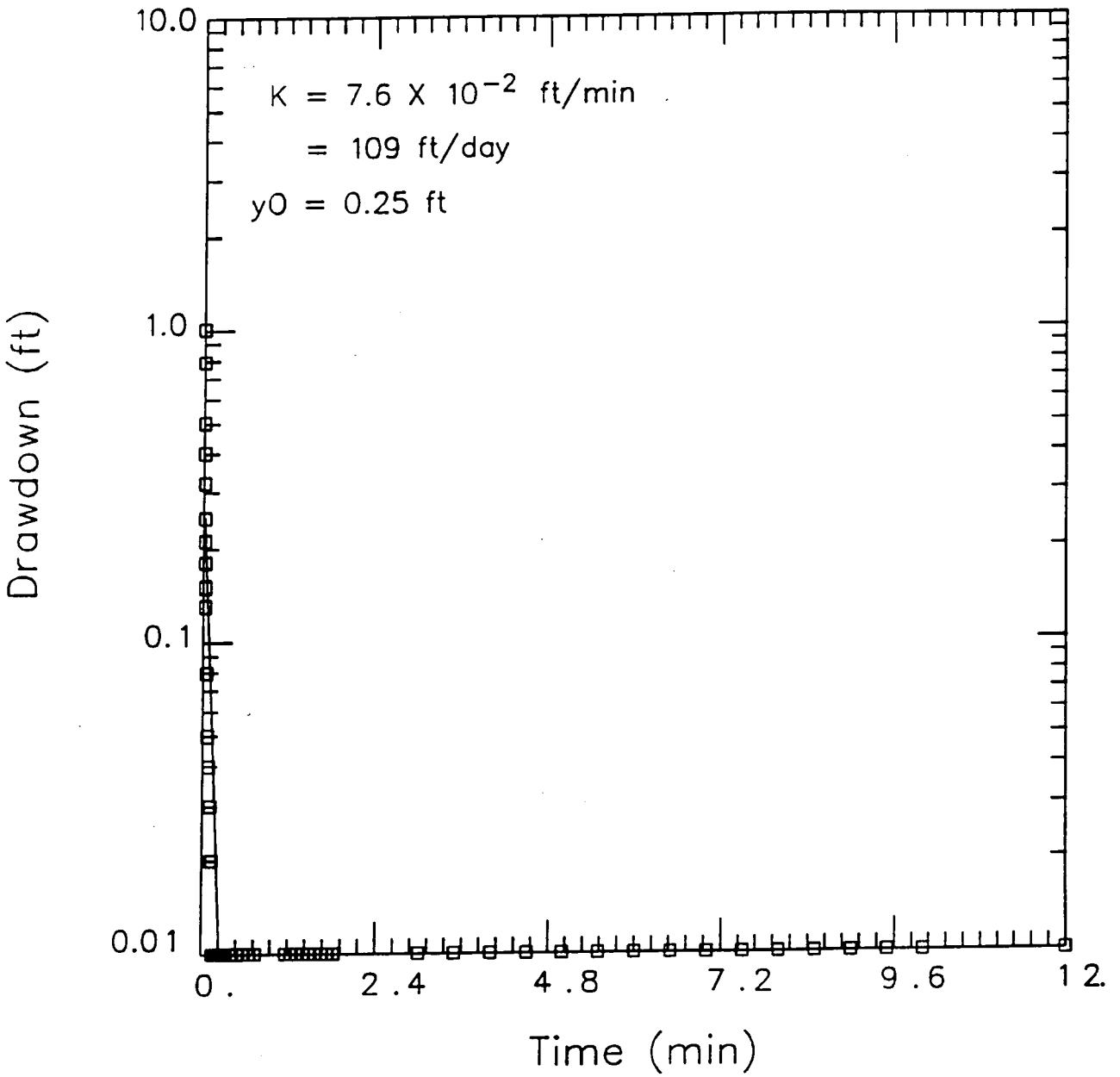
Reference	8.87
Scale factor	50.22
Offset	0.00

Step# 0 03/07 09:10

Elapsed Time	Value
0.0000	7.68
0.0033	7.74
0.0066	7.78
0.0099	7.82
0.0133	7.85
0.0166	7.90
0.0200	7.93
0.0233	7.96
0.0266	8.00
0.0300	8.01
0.0333	8.04
0.0500	8.14
0.0666	8.22
0.0833	8.28
0.1000	8.31
0.1166	8.34
0.1333	8.36
0.1500	8.39
0.1666	8.41
0.1833	8.42
0.2000	8.44
0.2166	8.47
0.2333	8.49
0.2500	8.50
0.2666	8.50
0.2833	8.52
0.3000	8.53
0.3166	8.55
0.3333	8.56
0.4167	8.61
0.5000	8.66
0.5833	8.69
0.6667	8.72
0.7500	8.74
0.8333	8.75
0.9167	8.77
1.0000	8.79
1.0833	8.80
1.1667	8.80
1.2500	8.82
1.3333	8.82
1.4166	8.83
1.5000	8.83
1.5833	8.83
1.6667	8.83
1.7500	8.85
1.8333	8.85
1.9167	8.85
2.0000	8.85
2.5000	8.87
3.0000	8.87
3.5000	8.87
4.0000	8.87
4.5000	8.87
5.0000	8.87
5.5000	8.87
6.0000	8.87
6.5000	8.87
7.0000	8.87
7.5000	8.87
8.0000	8.85
8.5000	8.87
9.0000	8.85
9.5000	8.87
10.0000	8.87
12.0000	8.85
14.0000	8.85
16.0000	8.85
18.0000	8.83
20.0000	8.83
22.0000	8.83
24.0000	8.83
26.0000	8.83

GOSS COVE LANDFILL

Slug Extraction Well 8-MW-1S



SE1000B
Environmental Logger
02/26 15:04

Unit# 00000 Test# 3

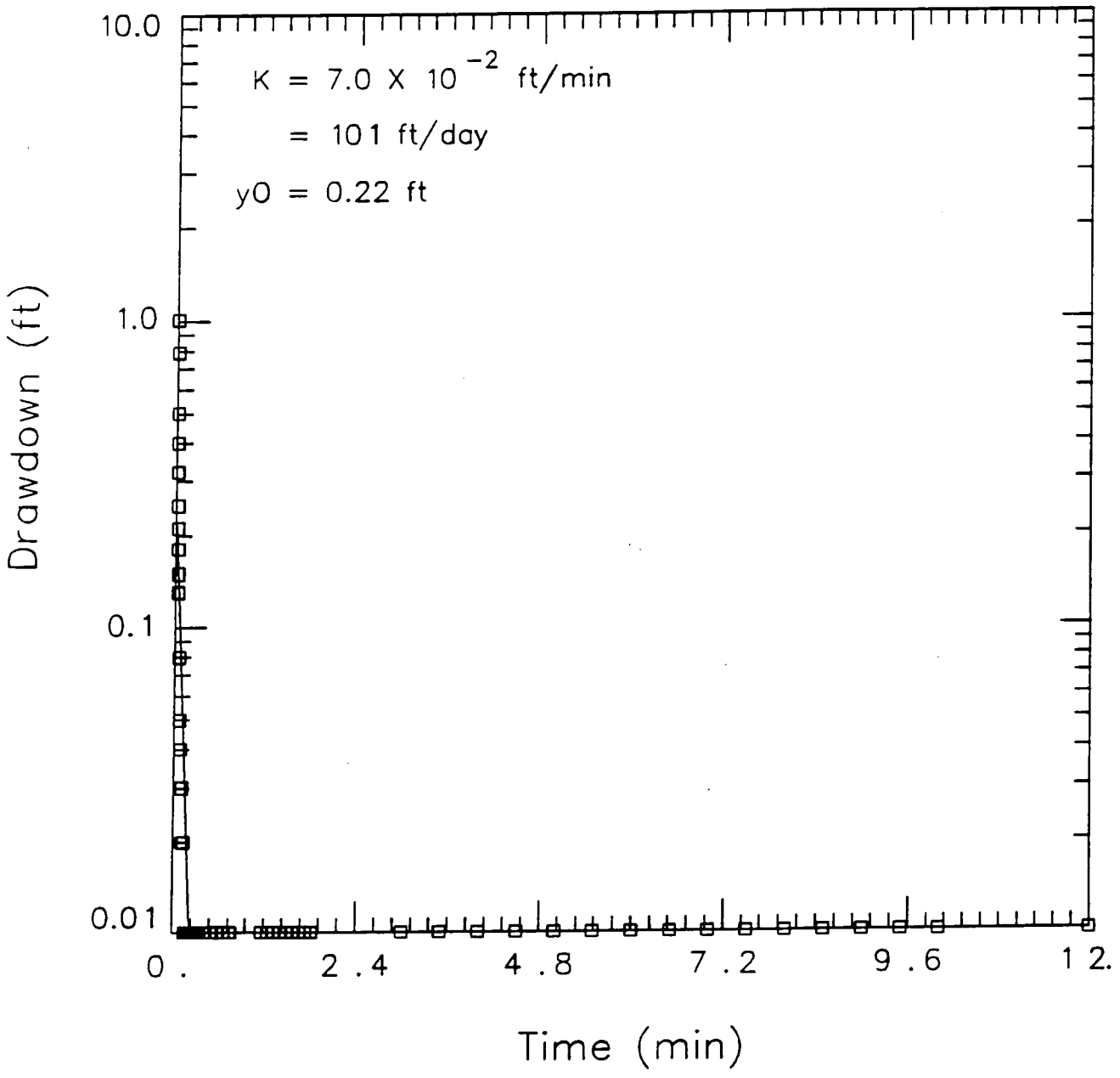
INPUT 1: Level (F)

Reference	9.76
Scale factor	10.01
Offset	0.00

Step# 0 02/26 08:11

Elapsed Time	Value
0.0000	9.68
0.0033	9.71
0.0066	9.74
0.0099	9.73
0.0133	9.76
0.0166	9.75
0.0200	9.75
0.0233	9.74
0.0266	9.74
0.0300	9.73
0.0333	9.73
0.0500	9.74
0.0666	9.74
0.0833	9.74
0.1000	9.74
0.1166	9.74
0.1333	9.74
0.1500	9.75
0.1666	9.75
0.1833	9.75
0.2000	9.75
0.2166	9.74
0.2333	9.75
0.2500	9.75
0.2666	9.75
0.2833	9.75
0.3000	9.74
0.3166	9.75
0.3333	9.75
0.4167	9.75
0.5000	9.75
0.5833	9.74
0.6667	9.75
0.7500	9.75
0.8333	9.75
0.9167	9.75
1.0000	9.75
1.0833	9.74
1.1667	9.74
1.2500	9.75
1.3333	9.75
1.4166	9.75
1.5000	9.75
1.5833	9.75
1.6667	9.75
1.7500	9.74
1.8333	9.74
1.9167	9.74
2.0000	9.74
2.5000	9.74
3.0000	9.74
3.5000	9.74
4.0000	9.73
4.5000	9.73
5.0000	9.73
5.5000	9.73
6.0000	9.72
6.5000	9.72
7.0000	9.72
7.5000	9.72
8.0000	9.72
8.5000	9.72
9.0000	9.72
9.5000	9.71
10.0000	9.71
12.0000	9.71

Slug Extraction Well 8-MW-3S



SE1000B
Environmental Logger
02/26 15:06

Unit# 00000 Test# 4

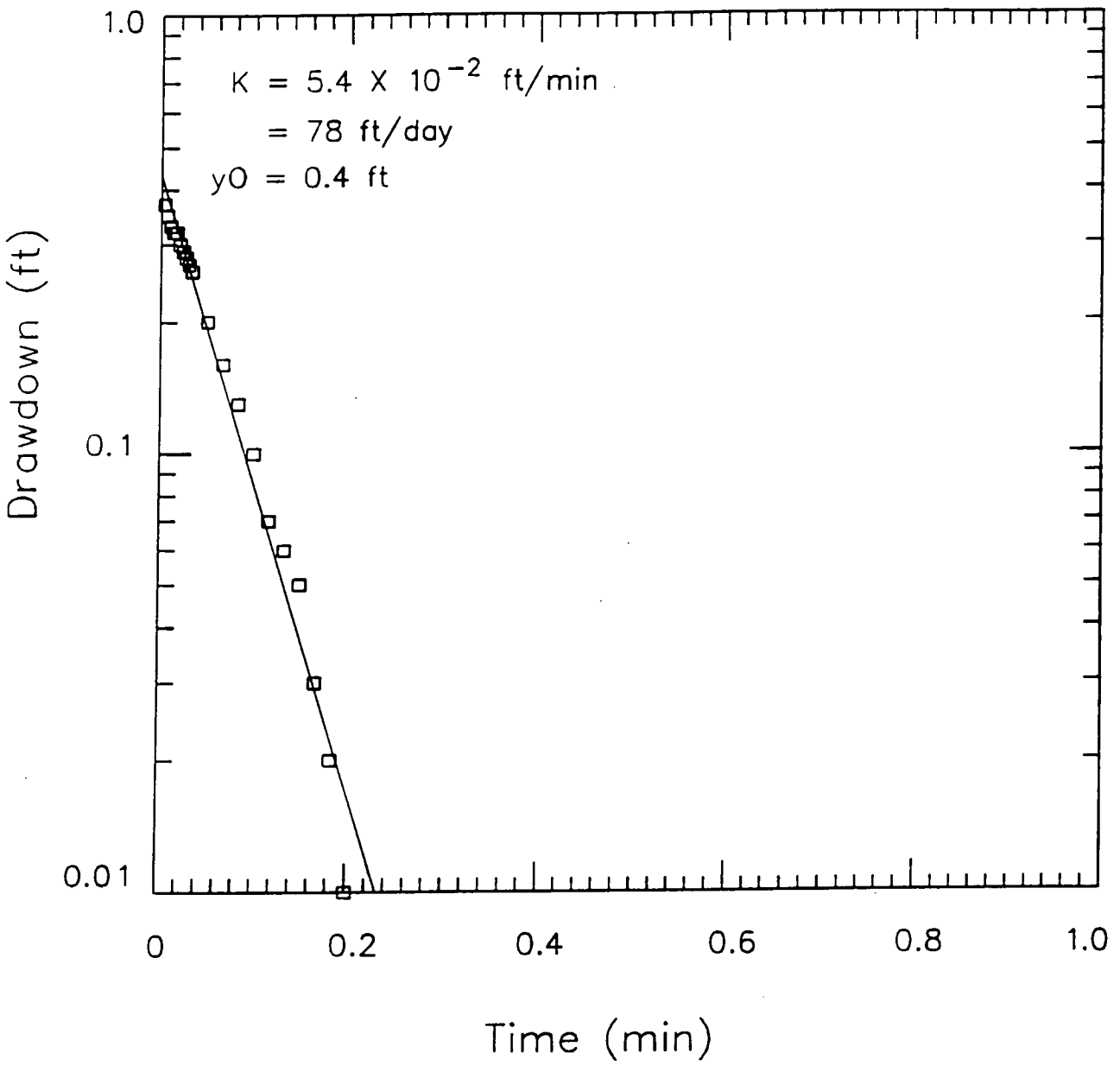
INPUT 1: Level (F)

Reference	7.94
Scale factor	10.01
Offset	0.00

Step# 0 02/26 08:36

Elapsed Time	Value
0.0000	7.48
0.0033	6.87
0.0066	7.09
0.0099	7.38
0.0133	7.48
0.0166	7.56
0.0200	7.63
0.0233	7.67
0.0266	7.70
0.0300	7.73
0.0333	7.75
0.0500	7.80
0.0666	7.83
0.0833	7.84
0.1000	7.85
0.1166	7.86
0.1333	7.86
0.1500	7.87
0.1666	7.87
0.1833	7.87
0.2000	7.87
0.2166	7.87
0.2333	7.87
0.2500	7.87
0.2666	7.87
0.2833	7.87
0.3000	7.87
0.3166	7.87
0.3333	7.87
0.4167	7.87
0.5000	7.87
0.5833	7.87
0.6667	7.87
0.7500	7.87
0.8333	7.88
0.9167	7.88
1.0000	7.88
1.0833	7.88
1.1667	7.87
1.2500	7.87
1.3333	7.87
1.4166	7.87
1.5000	7.87
1.5833	7.87
1.6667	7.87
1.7500	7.87
1.8333	7.87
1.9167	7.88
2.0000	7.88
2.5000	7.88
3.0000	7.87
3.5000	7.87
4.0000	7.87
4.5000	7.87
5.0000	7.87
5.5000	7.87
6.0000	7.87
6.5000	7.87
7.0000	7.87
7.5000	7.87
8.0000	7.87
8.5000	7.87
9.0000	7.87
9.5000	7.87
10.0000	7.87
12.0000	7.87

Slug Extraction Well 8-MW-4S



SE1000B
Environmental Logger
02/26 15:02

Unit# 00000 Test# 2

INPUT 1: Level (F)

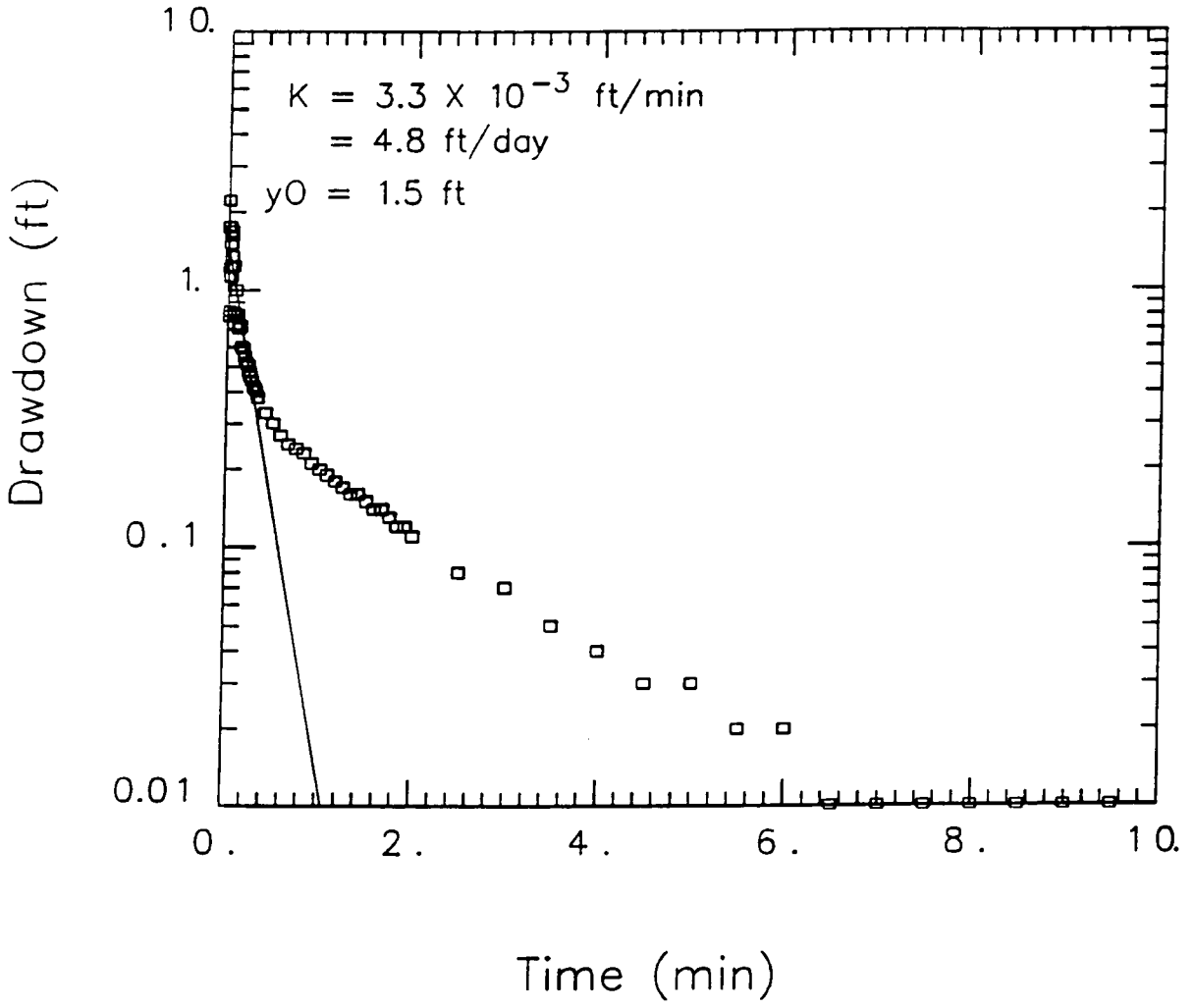
Reference	7.90
Scale factor	10.01
Offset	0.00

Step# 0 02/26 07:36

Elapsed Time	Value		
0.0000	7.56	1.1667	7.91
0.0033	7.53	1.2500	7.90
0.0066	7.55	1.3333	7.91
0.0099	7.57	1.4166	7.90
0.0133	7.58	1.5000	7.90
0.0166	7.58	1.5833	7.90
0.0200	7.60	1.6667	7.90
0.0233	7.61	1.7500	7.90
0.0266	7.62	1.8333	7.90
0.0300	7.63	1.9167	7.90
0.0333	7.64	2.0000	7.90
0.0500	7.70	2.5000	7.90
0.0666	7.74	3.0000	7.90
0.0833	7.77	3.5000	7.90
0.1000	7.80	4.0000	7.90
0.1166	7.83	4.5000	7.90
0.1333	7.84	5.0000	7.90
0.1500	7.85	5.5000	7.90
0.1666	7.87	6.0000	7.90
0.1833	7.88	6.5000	7.90
0.2000	7.89	7.0000	7.90
0.2166	7.90	7.5000	7.90
0.2333	7.90	8.0000	7.90
0.2500	7.90	8.5000	7.90
0.2666	7.90	9.0000	7.90
0.2833	7.91	9.5000	7.90
0.3000	7.90	10.0000	7.90
0.3166	7.90	12.0000	7.90
0.3333	7.90		
0.4167	7.91		
0.5000	7.91		
0.5833	7.91		
0.6667	7.91		
0.7500	7.91		
0.8333	7.91		
0.9167	7.91		
1.0000	7.91		
1.0833	7.90		

AREA A LANDFILL

Slug Extraction Well 2W-MW-3S



SE1000B
Environmental Logger
02/20 17:04

Unit# 00000 Test# 1

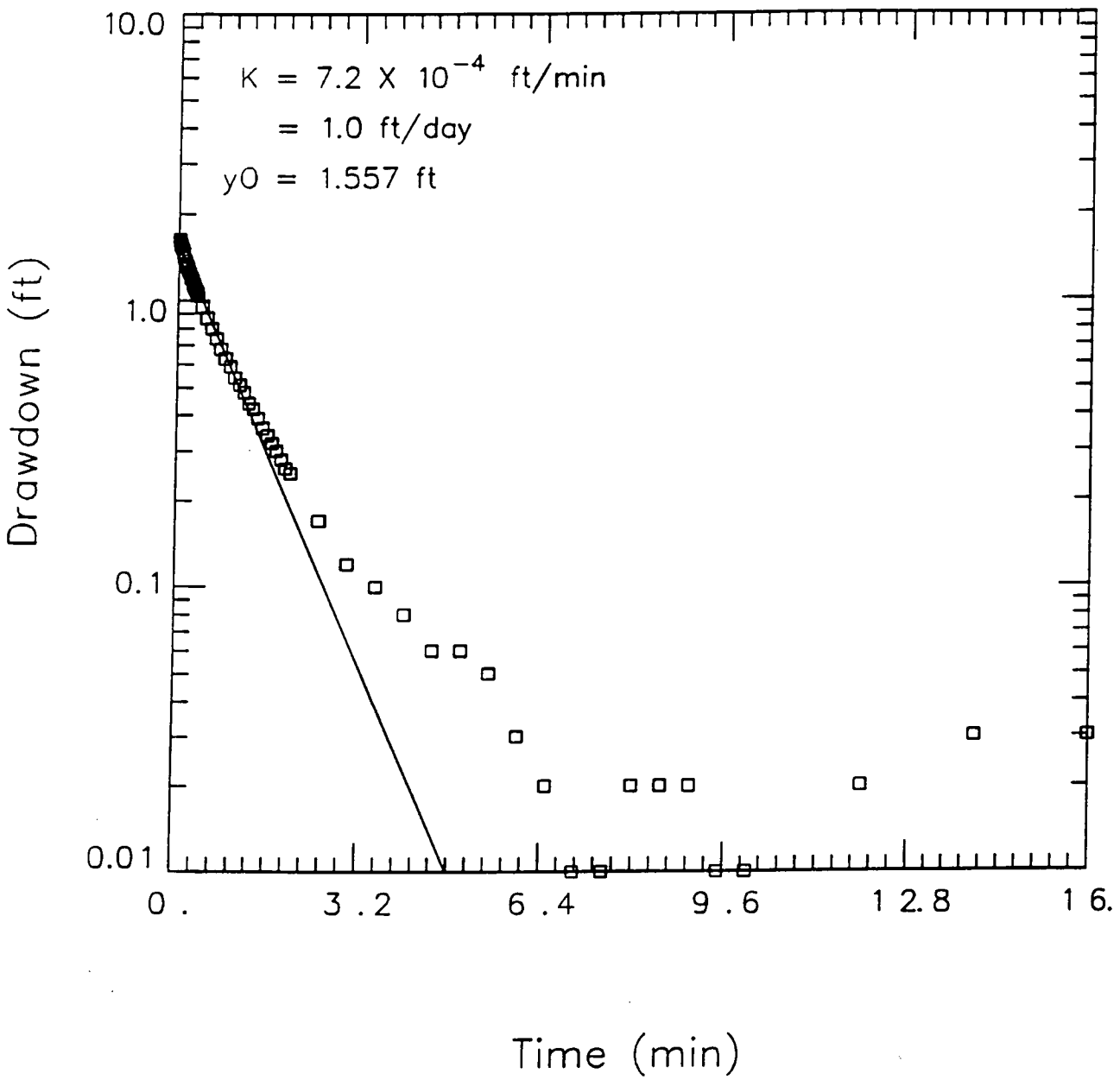
INPUT 1: Level (F)

Reference	14.58
Scale factor	10.01
Offset	0.00

Step# 0 02/18 15:54

Elapsed Time	Value
0.0000	12.27
0.0033	12.36
0.0066	12.83
0.0099	13.35
0.0133	13.75
0.0166	13.79
0.0200	13.45
0.0233	13.07
0.0266	12.89
0.0300	12.95
0.0333	13.23
0.0500	13.34
0.0666	13.77
0.0833	13.58
0.1000	13.78
0.1166	13.87
0.1333	13.86
0.1500	13.98
0.1666	13.99
0.1833	14.03
0.2000	14.06
0.2166	14.07
0.2333	14.10
0.2500	14.12
0.2666	14.14
0.2833	14.16
0.3000	14.17
0.3166	14.18
0.3333	14.20
0.4167	14.25
0.5000	14.28
0.5833	14.31
0.6667	14.33
0.7500	14.34
0.8333	14.35
0.9167	14.37
1.0000	14.38
1.0833	14.39
1.1667	14.40
1.2500	14.41
1.3333	14.42
1.4166	14.42
1.5000	14.43
1.5833	14.44
1.6667	14.44
1.7500	14.45
1.8333	14.46
1.9167	14.46
2.0000	14.47
2.5000	14.50
3.0000	14.51
3.5000	14.53
4.0000	14.54
4.5000	14.55
5.0000	14.55
5.5000	14.56
6.0000	14.56
6.5000	14.57
7.0000	14.57
7.5000	14.57
8.0000	14.57
8.5000	14.57
9.0000	14.57
9.5000	14.57
10.0000	14.58
12.0000	14.58
14.0000	14.58

Slug Extraction Well 2W-MW-5S



SE1000B
Environmental Logger
03/01 09:15

Unit# 00000 Test# 1

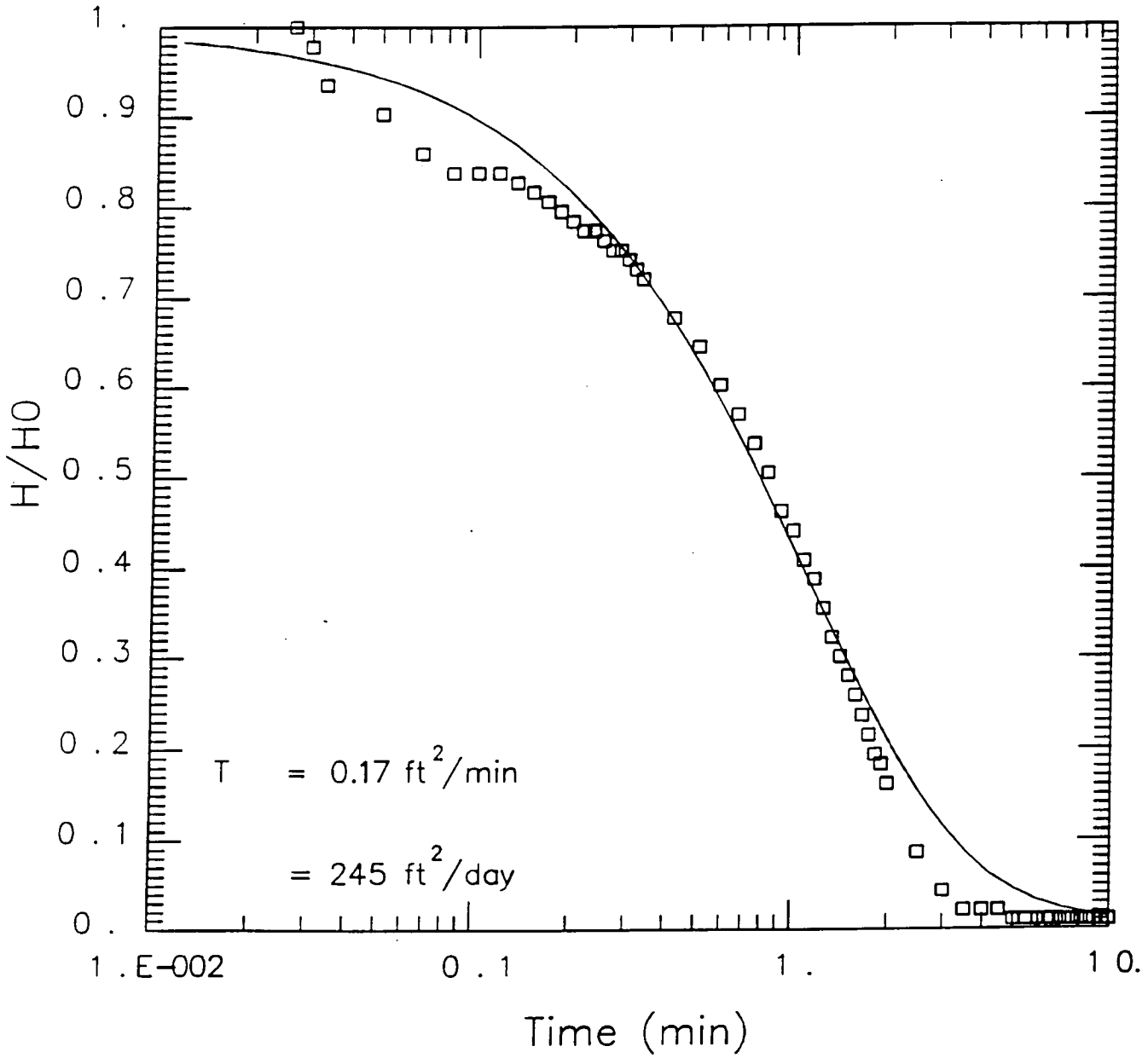
INPUT 1: Level (F)

Reference	10.42
Scale factor	10.01
Offset	0.00

Step# 0 02/27 13:48

Elapsed Time	Value
0.0000	8.77
0.0033	8.79
0.0066	8.81
0.0099	8.82
0.0133	8.82
0.0166	8.83
0.0200	8.85
0.0233	8.86
0.0266	8.86
0.0300	8.87
0.0333	8.88
0.0500	8.92
0.0666	8.96
0.0833	9.00
0.1000	9.04
0.1166	9.07
0.1333	9.10
0.1500	9.13
0.1666	9.16
0.1833	9.18
0.2000	9.21
0.2166	9.23
0.2333	9.25
0.2500	9.28
0.2666	9.30
0.2833	9.32
0.3000	9.34
0.3166	9.36
0.3333	9.38
0.4167	9.47
0.5000	9.55
0.5833	9.62
0.6667	9.68
0.7500	9.74
0.8333	9.79
0.9167	9.83
1.0000	9.88
1.0833	9.91
1.1667	9.94
1.2500	9.98
1.3333	10.00
1.4166	10.03
1.5000	10.06
1.5833	10.08
1.6667	10.10
1.7500	10.12
1.8333	10.14
1.9167	10.16
2.0000	10.17
2.5000	10.25
3.0000	10.30
3.5000	10.32
4.0000	10.34
4.5000	10.36
5.0000	10.36
5.5000	10.37
6.0000	10.39
6.5000	10.40
7.0000	10.41
7.5000	10.41
8.0000	10.40
8.5000	10.40
9.0000	10.40
9.5000	10.41
10.0000	10.41
12.0000	10.40
14.0000	10.39
16.0000	10.39

Slug Extraction Well 2W-MW-1D



SE1000B
Environmental Logger
02/15 16:12

Unit# 00000 Test# 1

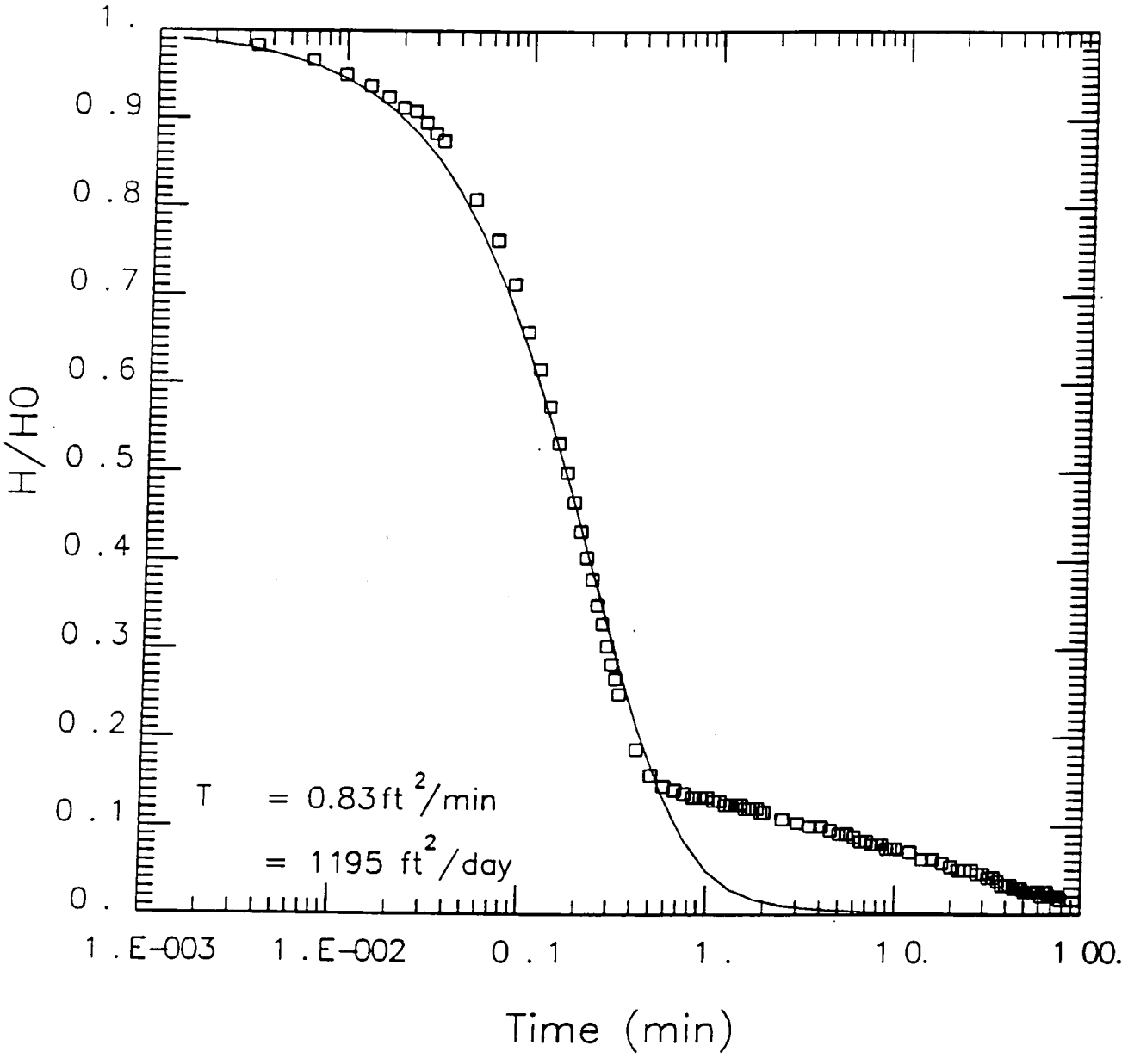
INPUT 1: Level (F)

Reference 16.10
Scale factor 10.01
Offset 0.00

Step# 0 02/15 12:21

Elapsed Time	Value
0.0000	15.83
0.0033	15.23
0.0066	15.36
0.0099	15.21
0.0133	15.29
0.0166	15.30
0.0200	15.33
0.0233	15.28
0.0266	15.17
0.0300	15.19
0.0333	15.23
0.0500	15.26
0.0666	15.30
0.0833	15.32
0.1000	15.32
0.1166	15.32
0.1333	15.33
0.1500	15.34
0.1666	15.35
0.1833	15.36
0.2000	15.37
0.2166	15.38
0.2333	15.38
0.2500	15.39
0.2666	15.40
0.2833	15.40
0.3000	15.41
0.3166	15.42
0.3333	15.43
0.4167	15.47
0.5000	15.50
0.5833	15.54
0.6667	15.57
0.7500	15.60
0.8333	15.63
0.9167	15.67
1.0000	15.69
1.0833	15.72
1.1667	15.74
1.2500	15.77
1.3333	15.80
1.4166	15.82
1.5000	15.84
1.5833	15.86
1.6667	15.88
1.7500	15.90
1.8333	15.92
1.9167	15.93
2.0000	15.95
2.5000	16.02
3.0000	16.06
3.5000	16.08
4.0000	16.08
4.5000	16.08
5.0000	16.09
5.5000	16.09
6.0000	16.09
6.5000	16.09
7.0000	16.09
7.5000	16.09
8.0000	16.09
8.5000	16.09
9.0000	16.09
9.5000	16.09
10.0000	16.09
12.0000	16.10
14.0000	16.10

Slug Extraction Well 2W-MW-2D



SE1000B
Environmental Logger
02/26 14:59

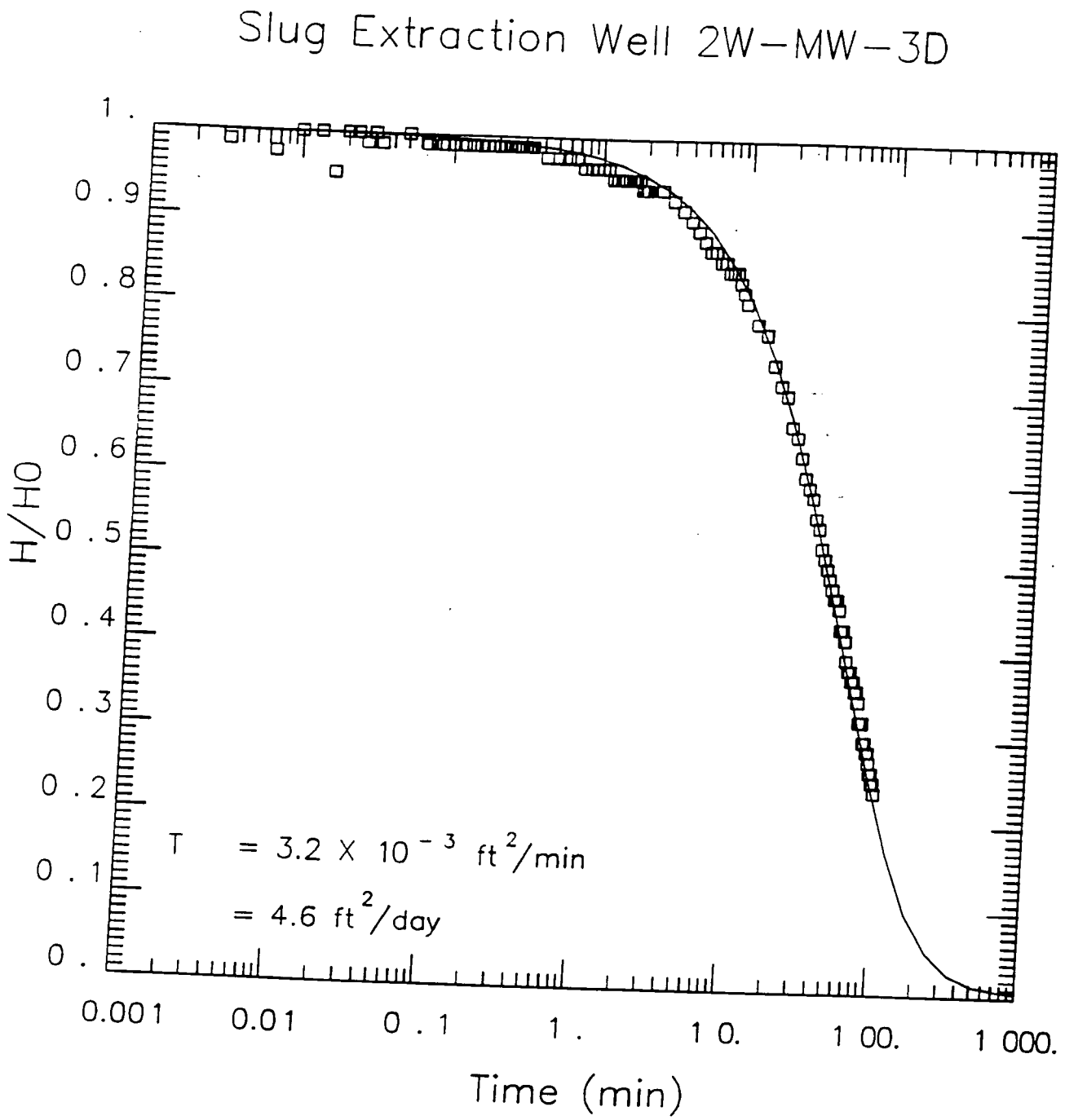
Unit# 00000 Test# 1

INPUT 1: Level (F)

Reference	17.12
Scale factor	10.01
Offset	0.00

Step# 0 02/25 14:27

Elapsed Time	Value
0.0000	14.72
0.0033	14.76
0.0066	14.80
0.0099	14.84
0.0133	14.87
0.0166	14.90
0.0200	14.93
0.0233	14.94
0.0266	14.97
0.0300	15.00
0.0333	15.02
0.0500	15.18
0.0666	15.29
0.0833	15.41
0.1000	15.54
0.1166	15.64
0.1333	15.74
0.1500	15.84
0.1666	15.92
0.1833	16.00
0.2000	16.08
0.2166	16.15
0.2333	16.21
0.2500	16.28
0.2666	16.33
0.2833	16.39
0.3000	16.44
0.3166	16.48
0.3333	16.52
0.4167	16.67
0.5000	16.74
0.5833	16.77
0.6667	16.78
0.7500	16.79
0.8333	16.80
0.9167	16.80
1.0000	16.80
1.0833	16.81
1.1667	16.81
1.2500	16.82
1.3333	16.82
1.4166	16.82
1.5000	16.82
1.5833	16.83
1.6667	16.83
1.7500	16.83
1.8333	16.83
1.9167	16.84
2.0000	16.84
2.5000	16.86
3.0000	16.87
3.5000	16.88
4.0000	16.88
4.5000	16.89
5.0000	16.90
5.5000	16.90
6.0000	16.91
6.5000	16.92
7.0000	16.92
7.5000	16.93
8.0000	16.93
8.5000	16.93
9.0000	16.94
9.5000	16.94
10.0000	16.94
12.0000	16.95
14.0000	16.97
16.0000	16.97
18.0000	16.98
20.0000	16.99
22.0000	17.00
24.0000	17.00
26.0000	17.00
28.0000	17.01
30.0000	17.01
32.0000	17.02
34.0000	17.02
36.0000	17.03
38.0000	17.04
40.0000	17.04
42.0000	17.04
44.0000	17.05
46.0000	17.05
48.0000	17.05
50.0000	17.06
52.0000	17.06
54.0000	17.06
56.0000	17.06
58.0000	17.06
60.0000	17.06
62.0000	17.07
64.0000	17.06
66.0000	17.06
68.0000	17.07
70.0000	17.07
72.0000	17.07
74.0000	17.07
76.0000	17.07
78.0000	17.08


Slug Extraction Well 2W-MW-3D
H/HO
1.
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.
T = 3.2 X 10^-3 ft^2/min
= 4.6 ft^2/day
0.001
0.01
0.1
1.
10.
100.
1000.
Time (min)

SE1000B
Environmental Logger
02/22 15:03

Unit# 00000 Test# 2

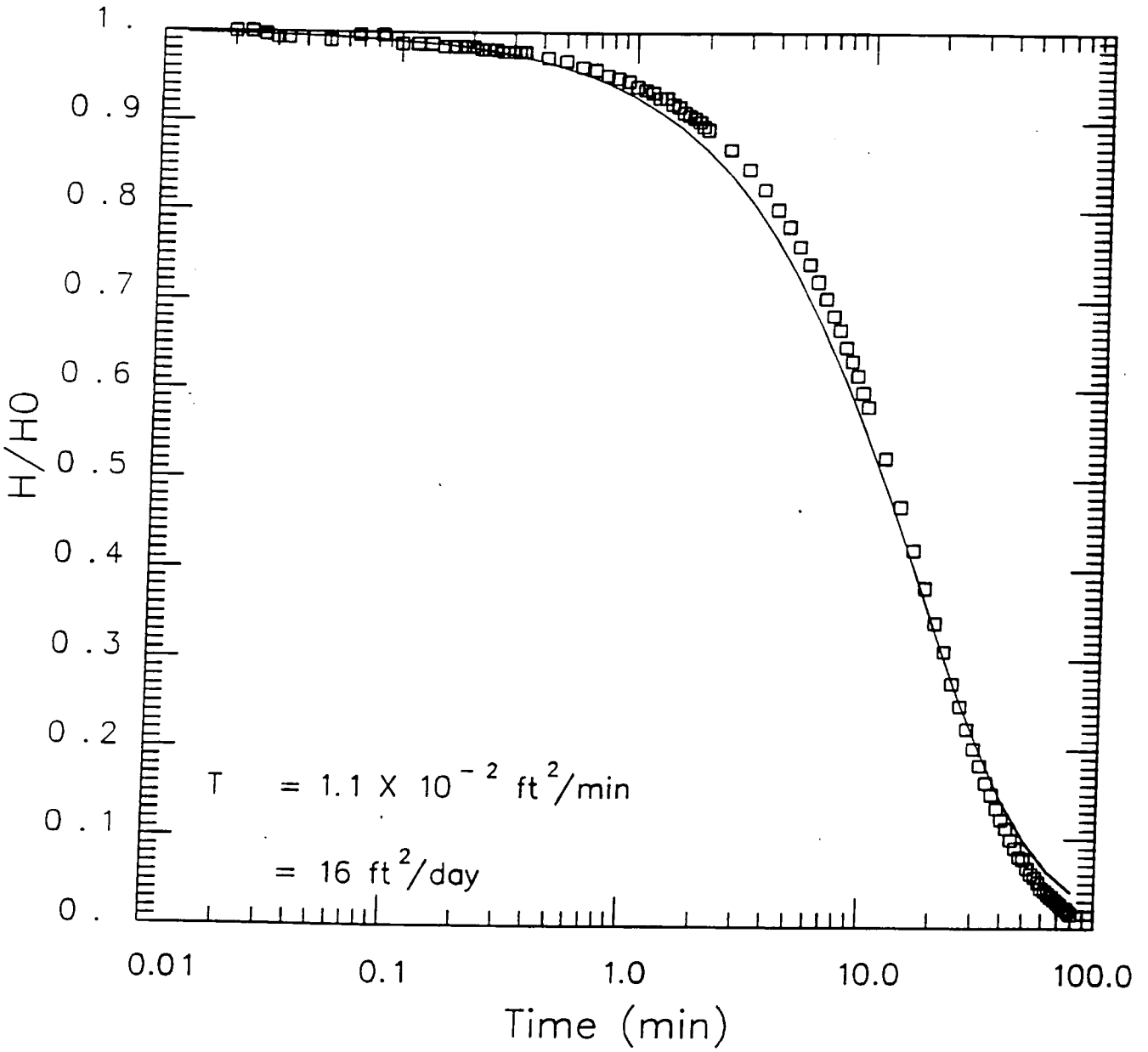
INPUT 1: Level (F)

Reference	18.59
Scale factor	10.01
Offset	0.00

Step# 0 02/21 13:58

Elapsed Time	Value
0.0000	17.75
0.0033	17.76
0.0066	17.77
0.0099	17.75
0.0133	17.75
0.0166	17.79
0.0200	17.75
0.0233	17.75
0.0266	17.76
0.0300	17.75
0.0333	17.76
0.0500	17.75
0.0666	17.76
0.0833	17.76
0.1000	17.76
0.1166	17.76
0.1333	17.76
0.1500	17.76
0.1666	17.76
0.1833	17.76
0.2000	17.76
0.2166	17.76
0.2333	17.76
0.2500	17.76
0.2666	17.76
0.2833	17.76
0.3000	17.76
0.3166	17.76
0.3333	17.76
0.4167	17.77
0.5000	17.77
0.5833	17.77
0.6667	17.77
0.7500	17.78
0.8333	17.78
0.9167	17.78
1.0000	17.78
1.0833	17.78
1.1667	17.79
1.2500	17.79
1.3333	17.79
1.4166	17.79
1.5000	17.79
1.5833	17.79
1.6667	17.79
1.7500	17.79
1.8333	17.80
1.9167	17.80
2.0000	17.80
2.5000	17.80
3.0000	17.81
3.5000	17.82
4.0000	17.83
4.5000	17.84
5.0000	17.85
5.5000	17.86
6.0000	17.86
6.5000	17.87
7.0000	17.87
7.5000	17.88
8.0000	17.88
8.5000	17.88
9.0000	17.89
9.5000	17.90
10.0000	17.91
12.0000	17.93
14.0000	17.94
16.0000	17.97
18.0000	17.99
20.0000	18.00
22.0000	18.03
24.0000	18.04
26.0000	18.06
28.0000	18.08
30.0000	18.09
32.0000	18.10
34.0000	18.12
36.0000	18.13
38.0000	18.15
40.0000	18.16
42.0000	18.17
44.0000	18.18
46.0000	18.19
48.0000	18.20
50.0000	18.20
52.0000	18.21
54.0000	18.23
56.0000	18.23
58.0000	18.24
60.0000	18.26
62.0000	18.27
64.0000	18.27
66.0000	18.28
68.0000	18.28
70.0000	18.29
72.0000	18.29
74.0000	18.30
76.0000	18.32
78.0000	18.32
80.0000	18.32
82.0000	18.34
84.0000	18.34
86.0000	18.35
88.0000	18.35
90.0000	18.36
92.0000	18.3[illegible]
94.0000	18.37
96.0000	18.38
98.0000	18.38
100.000	18.39

Slug Extraction Well 2W-MW-6



SE1000B
Environmental Logger
03/06 11:39

Unit# 01027 Test# 6

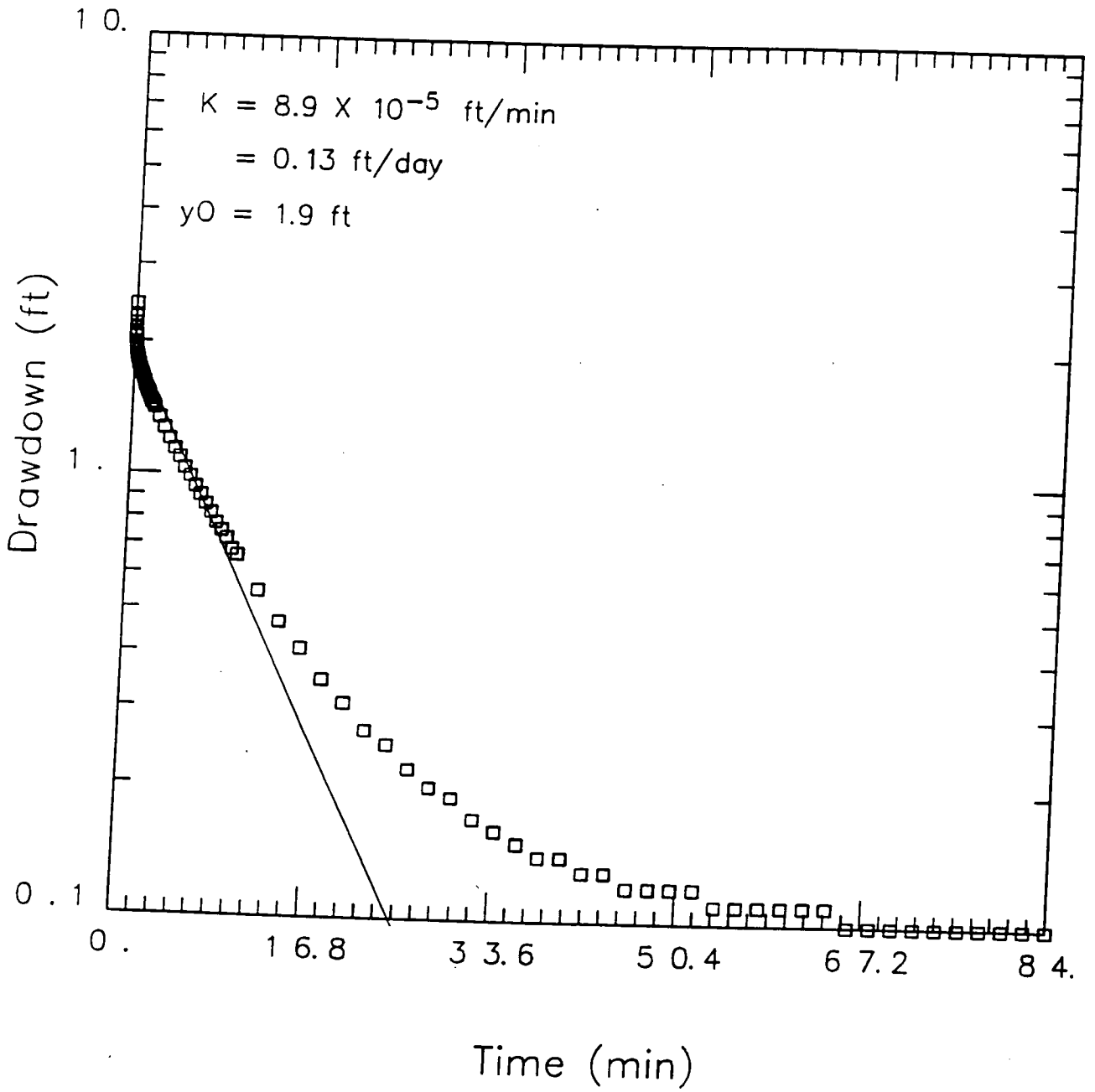
INPUT 1: Level (F)

Reference	11.47
Scale factor	10.01
Offset	0.00

Step# 0 03/04 14:37

Elapsed Time	Value
0.0000	8.35
0.0033	8.35
0.0066	8.35
0.0099	8.36
0.0133	8.35
0.0166	8.35
0.0200	8.34
0.0233	8.34
0.0266	8.35
0.0300	8.36
0.0333	8.36
0.0500	8.37
0.0666	8.35
0.0833	8.35
0.1000	8.38
0.1166	8.38
0.1333	8.38
0.1500	8.39
0.1666	8.39
0.1833	8.39
0.2000	8.39
0.2166	8.40
0.2333	8.40
0.2500	8.40
0.2666	8.41
0.2833	8.41
0.3000	8.41
0.3166	8.41
0.3333	8.41
0.4167	8.43
0.5000	8.44
0.5833	8.46
0.6667	8.47
0.7500	8.49
0.8333	8.50
0.9167	8.51
1.0000	8.53
1.0833	8.54
1.1667	8.55
1.2500	8.57
1.3333	8.57
1.4166	8.59
1.5000	8.60
1.5833	8.62
1.6667	8.63
1.7500	8.64
1.8333	8.65
1.9167	8.67
2.0000	8.68
2.5000	8.75
3.0000	8.82
3.5000	8.89
4.0000	8.96
4.5000	9.02
5.0000	9.09
5.5000	9.15
6.0000	9.21
6.5000	9.27
7.0000	9.33
7.5000	9.38
8.0000	9.44
8.5000	9.49
9.0000	9.54
9.5000	9.60
10.0000	9.65
12.0000	9.83
14.0000	10.00
16.0000	10.15
18.0000	10.28
20.0000	10.40
22.0000	10.50
24.0000	10.61
26.0000	10.69
28.0000	10.77
30.0000	10.84
32.0000	10.90
34.0000	10.96
36.0000	11.00
38.0000	11.05
40.0000	11.09
42.0000	11.12
44.0000	11.16
46.0000	11.19
48.0000	11.22
50.0000	11.23
52.0000	11.26
54.0000	11.28
56.0000	11.29
58.0000	11.31
60.0000	11.33
62.0000	11.34
64.0000	11.35
66.0000	11.36
68.0000	11.37
70.0000	11.38
72.0000	11.39
74.0000	11.40
76.0000	11.40
78.0000	11.41
80.0000	11.42

Slug Extraction Well 2L-MW-7S



SE1000B
Environmental Logger
02/20 17:27

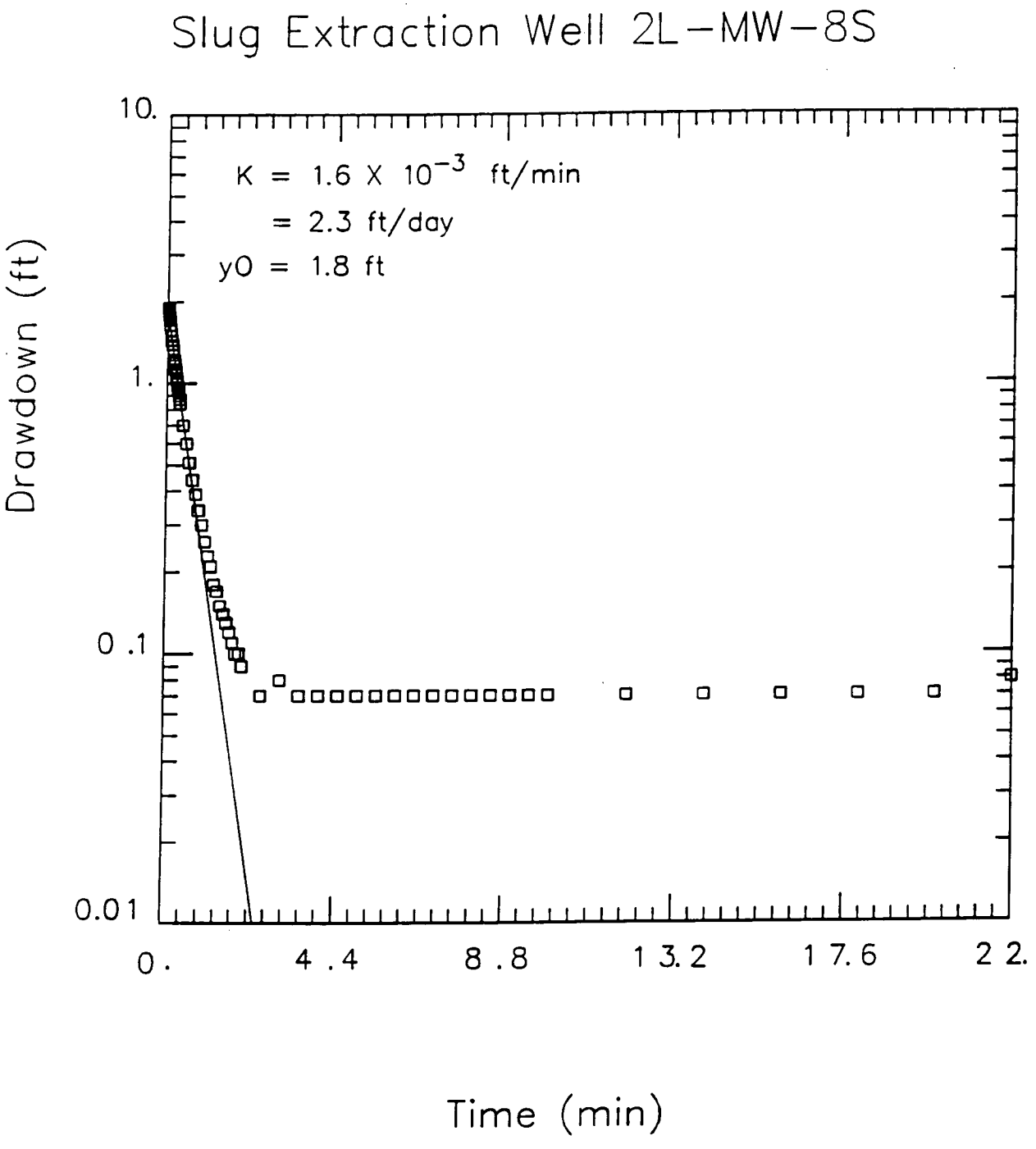
Unit# 00000 Test# 0

INPUT 1: Level (F)

Reference	12.45
Scale factor	10.01
Offset	0.00

Step# 0 02/18 13:57

Elapsed Time	Value
0.0000	10.02
0.0033	10.02
0.0066	10.26
0.0099	10.36
0.0133	10.17
0.0166	10.19
0.0200	10.38
0.0233	10.39
0.0266	10.36
0.0300	10.35
0.0333	10.39
0.0500	10.41
0.0666	10.46
0.0833	10.50
0.1000	10.52
0.1166	10.53
0.1333	10.54
0.1500	10.56
0.1666	10.57
0.1833	10.58
0.2000	10.59
0.2166	10.59
0.2333	10.60
0.2500	10.61
0.2666	10.62
0.2833	10.63
0.3000	10.63
0.3166	10.64
0.3333	10.65
0.4167	10.68
0.5000	10.71
0.5833	10.73
0.6667	10.76
0.7500	10.77
0.8333	10.79
0.9167	10.82
1.0000	10.84
1.0833	10.86
1.1667	10.88
1.2500	10.90
1.3333	10.92
1.4166	10.93
1.5000	10.95
1.5833	10.97
1.6667	10.98
1.7500	11.00
1.8333	11.01
1.9167	11.02
2.0000	11.04
2.5000	11.11
3.0000	11.18
3.5000	11.25
4.0000	11.31
4.5000	11.36
5.0000	11.42
5.5000	11.46
6.0000	11.51
6.5000	11.55
7.0000	11.59
7.5000	11.63
8.0000	11.67
8.5000	11.70
9.0000	11.73
9.5000	11.77
10.0000	11.79
12.0000	11.90
14.0000	11.98
16.0000	12.04
18.0000	12.10
20.0000	12.14
22.0000	12.18
24.0000	12.20
26.0000	12.23
28.0000	12.25
30.0000	12.26
32.0000	12.28
34.0000	12.29
36.0000	12.30
38.0000	12.31
40.0000	12.31
42.0000	12.32
44.0000	12.32
46.0000	12.33
48.0000	12.33
50.0000	12.33
52.0000	12.33
54.0000	12.34
56.0000	12.34
58.0000	12.34
60.0000	12.34
62.0000	12.34
64.0000	12.34
66.0000	12.35
68.0000	12.35
70.0000	12.35
72.0000	12.35
74.0000	12.35
76.0000	12.35
78.0000	12.35
80.0000	12.35
82.0000	12.35
84.0000	12.35


Slug Extraction Well 2L-MW-8S
K = 1.6 X 10^-3 ft/min
= 2.3 ft/day
y0 = 1.8 ft
10.
1.
0.1
0.01
Drawdown (ft)
0.
4.4
8.8
13.2
17.6
22.
Time (min)

SE1000B
Environmental Logger
03/01 09:13

Unit# 00000 Test# 0

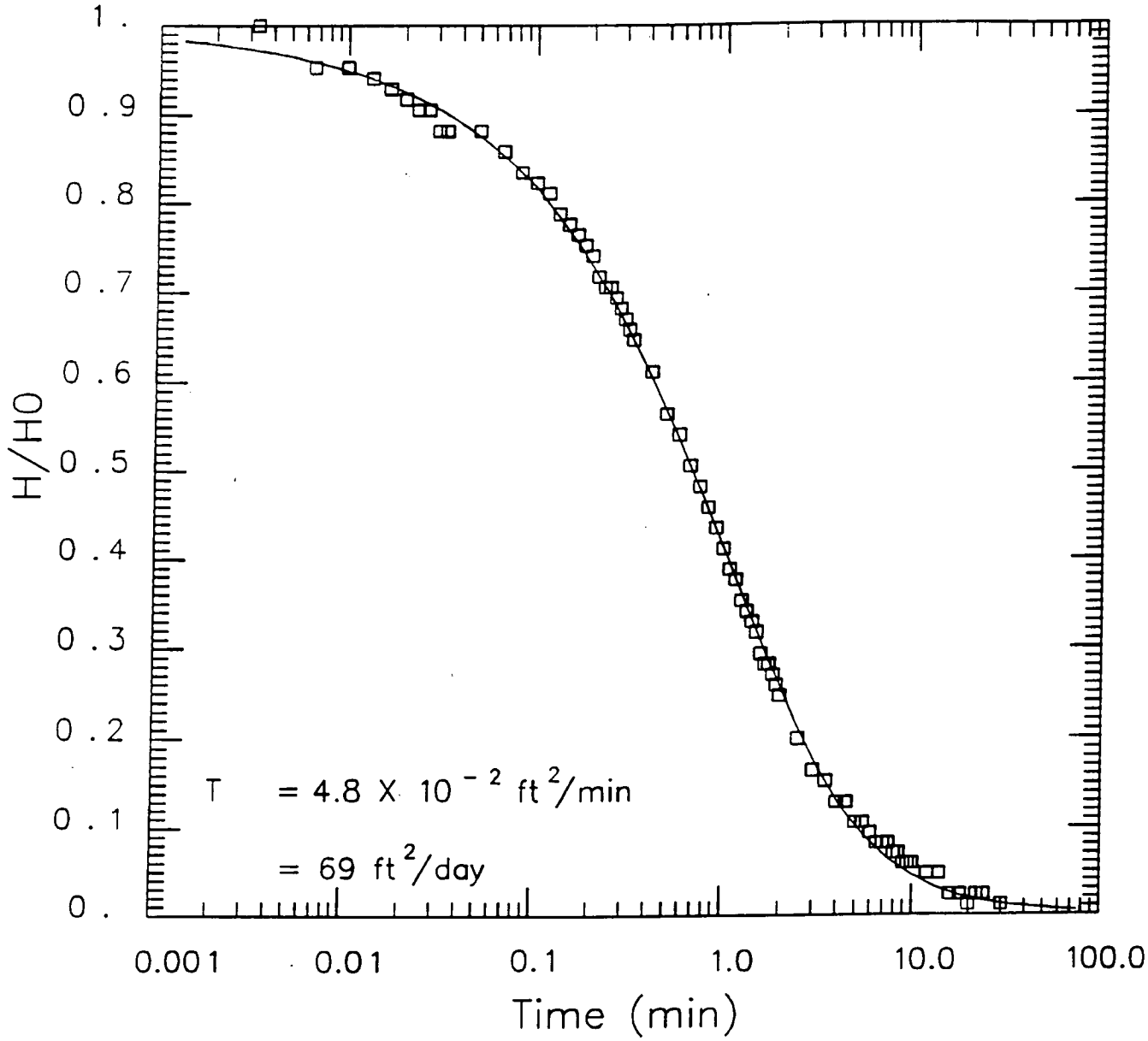
INPUT 1: Level (F)

Reference 15.08
Scale factor 10.01
Offset 0.00

Step# 0 02/27 09:59

Elapsed Time	Value
0.0000	13.15
0.0033	13.18
0.0066	13.20
0.0099	13.23
0.0133	13.25
0.0166	13.28
0.0200	13.30
0.0233	13.32
0.0266	13.34
0.0300	13.35
0.0333	13.37
0.0500	13.45
0.0666	13.52
0.0833	13.59
0.1000	13.65
0.1166	13.70
0.1333	13.76
0.1500	13.81
0.1666	13.86
0.1833	13.90
0.2000	13.95
0.2166	13.99
0.2333	14.03
0.2500	14.07
0.2666	14.11
0.2833	14.14
0.3000	14.18
0.3166	14.21
0.3333	14.24
0.4167	14.38
0.5000	14.48
0.5833	14.57
0.6667	14.64
0.7500	14.69
0.8333	14.74
0.9167	14.78
1.0000	14.82
1.0833	14.85
1.1667	14.87
1.2500	14.90
1.3333	14.91
1.4166	14.93
1.5000	14.94
1.5833	14.95
1.6667	14.96
1.7500	14.97
1.8333	14.98
1.9167	14.98
2.0000	14.99
2.5000	15.01
3.0000	15.00
3.5000	15.01
4.0000	15.01
4.5000	15.01
5.0000	15.01
5.5000	15.01
6.0000	15.01
6.5000	15.01
7.0000	15.01
7.5000	15.01
8.0000	15.01
8.5000	15.01
9.0000	15.01
9.5000	15.01
10.0000	15.01
12.0000	15.01
14.0000	15.01
16.0000	15.01
18.0000	15.01
20.0000	15.01
22.0000	15.00

Slug Extraction Well 2L-MW-7D



SE1000B
Environmental Logger
02/15 16:15

Unit# 00000 Test# 2

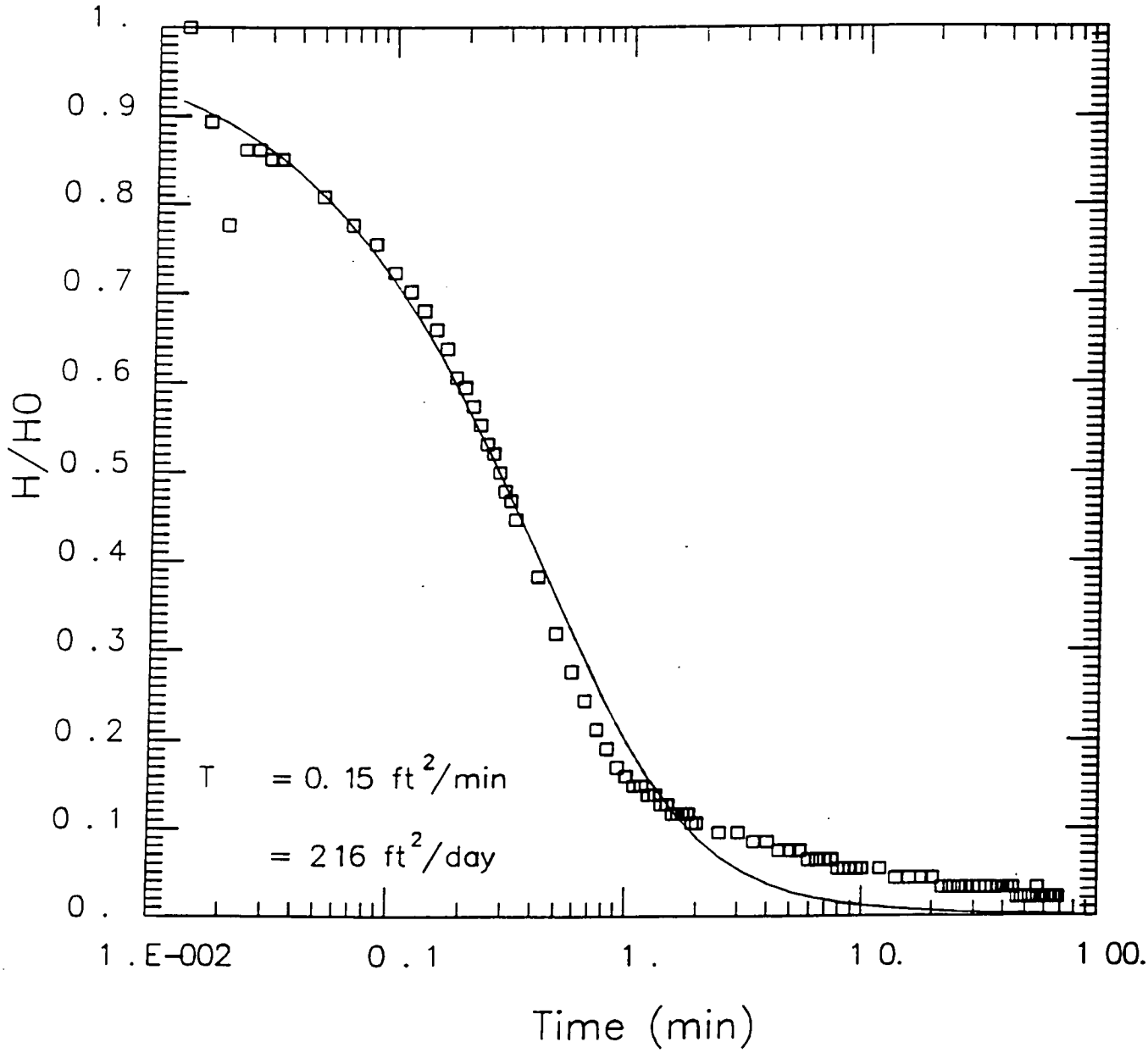
INPUT 1: Level (F)

Reference	7.18
Scale factor	10.01
Offset	0.00

Step# 0 02/15 14:22

Elapsed Time	Value
0.0000	6.38
0.0033	6.33
0.0066	6.37
0.0099	6.37
0.0133	6.38
0.0166	6.39
0.0200	6.40
0.0233	6.41
0.0266	6.41
0.0300	6.43
0.0333	6.43
0.0500	6.43
0.0666	6.45
0.0833	6.47
0.1000	6.48
0.1166	6.49
0.1333	6.51
0.1500	6.52
0.1666	6.53
0.1833	6.54
0.2000	6.55
0.2166	6.57
0.2333	6.58
0.2500	6.58
0.2666	6.59
0.2833	6.60
0.3000	6.61
0.3166	6.62
0.3333	6.63
0.4167	6.66
0.5000	6.70
0.5833	6.72
0.6667	6.75
0.7500	6.77
0.8333	6.79
0.9167	6.81
1.0000	6.83
1.0833	6.85
1.1667	6.86
1.2500	6.88
1.3333	6.89
1.4166	6.90
1.5000	6.91
1.5833	6.93
1.6667	6.94
1.7500	6.94
1.8333	6.95
1.9167	6.96
2.0000	6.97
2.5000	7.01
3.0000	7.04
3.5000	7.05
4.0000	7.07
4.5000	7.07
5.0000	7.09
5.5000	7.09
6.0000	7.10
6.5000	7.11
7.0000	7.11
7.5000	7.11
8.0000	7.12
8.5000	7.12
9.0000	7.13
9.5000	7.13
10.0000	7.13
12.0000	7.14
14.0000	7.14
16.0000	7.16
18.0000	7.16
20.0000	7.17
22.0000	7.16
24.0000	7.16
26.0000	7.18
28.0000	7.18
30.0000	7.17
32.0000	7.18
34.0000	7.18

Slug Extraction Well 2L-MW-18D



SE1000B
Environmental Logger
02/15 16:08

Unit# 00000 Test# 0

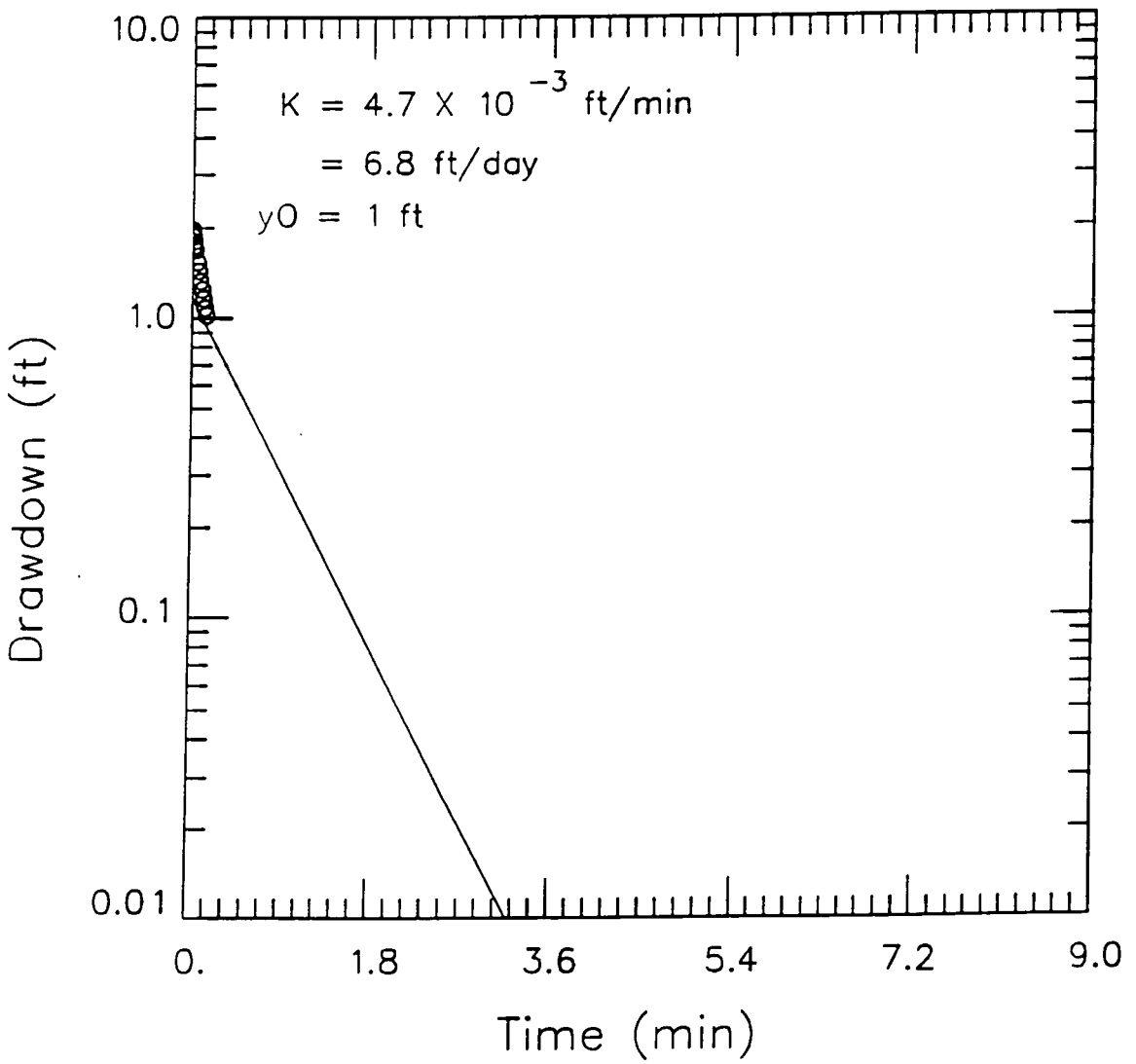
INPUT 1: Level (F)

Reference	16.10
Scale factor	10.01
Offset	0.00

Step# 0 02/15 09:39

Elapsed Time	Value
0.0000	9.50
0.0033	9.52
0.0066	9.72
0.0099	9.33
0.0133	9.02
0.0166	9.12
0.0200	9.23
0.0233	9.15
0.0266	9.15
0.0300	9.16
0.0333	9.16
0.0500	9.20
0.0666	9.23
0.0833	9.25
0.1000	9.28
0.1166	9.30
0.1333	9.32
0.1500	9.34
0.1666	9.36
0.1833	9.39
0.2000	9.40
0.2166	9.42
0.2333	9.44
0.2500	9.46
0.2666	9.47
0.2833	9.49
0.3000	9.51
0.3166	9.52
0.3333	9.54
0.4167	9.60
0.5000	9.66
0.5833	9.70
0.6667	9.73
0.7500	9.76
0.8333	9.78
0.9167	9.80
1.0000	9.81
1.0833	9.82
1.1667	9.82
1.2500	9.83
1.3333	9.83
1.4166	9.84
1.5000	9.84
1.5833	9.85
1.6667	9.85
1.7500	9.85
1.8333	9.85
1.9167	9.86
2.0000	9.86
2.5000	9.87
3.0000	9.87
3.5000	9.88
4.0000	9.88
4.5000	9.89
5.0000	9.89
5.5000	9.89
6.0000	9.90
6.5000	9.90
7.0000	9.90
7.5000	9.90
8.0000	9.91
8.5000	9.91
9.0000	9.91
9.5000	9.91
10.0000	9.91
12.0000	9.91
14.0000	9.92
16.0000	9.92
18.0000	9.92
20.0000	9.92
22.0000	9.93
24.0000	9.93
26.0000	9.93
28.0000	9.93
30.0000	9.93
32.0000	9.93
34.0000	9.93
36.0000	9.93
38.0000	9.93
40.0000	9.93
42.0000	9.93
44.0000	9.93
46.0000	9.94
48.0000	9.94
50.0000	9.94
52.0000	9.94
54.0000	9.94
56.0000	9.93
58.0000	9.94
60.0000	9.94
62.0000	9.94
64.0000	9.94
66.0000	9.94
68.0000	9.94

Slug Extraction Well 2D-MW-16S



SE1000B
Environmental Logger
02/20 17:38

Unit# 00000 Test# 2

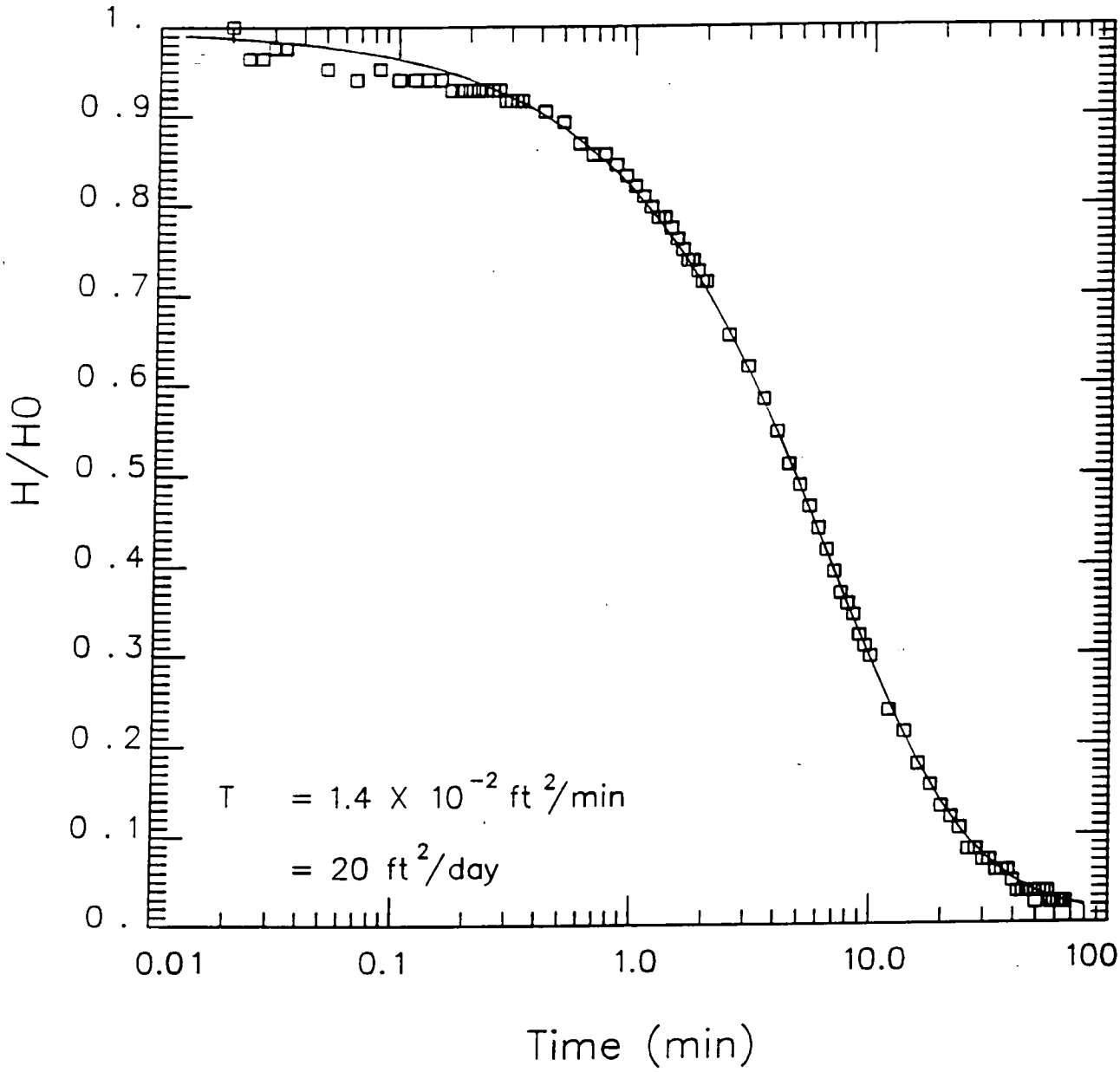
INPUT 1: Level (F)

Reference	9.15
Scale factor	10.01
Offset	0.00

Step# 0 02/20 10:04

Elapsed Time	Value		
0.0000	7.19	1.1667	8.88
0.0033	7.22	1.2500	8.92
0.0066	7.26	1.3333	8.96
0.0099	7.29	1.4166	8.99
0.0133	7.30	1.5000	9.01
0.0166	7.36	1.5833	9.04
0.0200	7.39	1.6667	9.06
0.0233	7.42	1.7500	9.07
0.0266	7.44	1.8333	9.09
0.0300	7.47	1.9167	9.09
0.0333	7.50	2.0000	9.10
0.0500	7.62	2.5000	9.13
0.0666	7.72	3.0000	9.14
0.0833	7.83	3.5000	9.14
0.1000	7.91	4.0000	9.15
0.1166	7.99	4.5000	9.15
0.1333	8.07	5.0000	9.15
0.1500	8.13	5.5000	9.15
0.1666	8.19	6.0000	9.15
0.1833	8.24	6.5000	9.15
0.2000	8.28	7.0000	9.15
0.2166	8.31	7.5000	9.15
0.2333	8.34	8.0000	9.15
0.2500	8.37	8.5000	9.14
0.2666	8.39	9.0000	9.15
0.2833	8.41	9.5000	9.15
0.3000	8.42	10.0000	9.15
0.3166	8.43		
0.3333	8.45		
0.4167	8.50		
0.5000	8.56		
0.5833	8.61		
0.6667	8.66		
0.7500	8.70		
0.8333	8.73		
0.9167	8.77		
1.0000	8.80		
1.0833	8.83		

Slug Extraction Well 2D-MW-10D



SE1000B
Environmental Logger
02/26 15:08

Unit# 00000 Test# 5

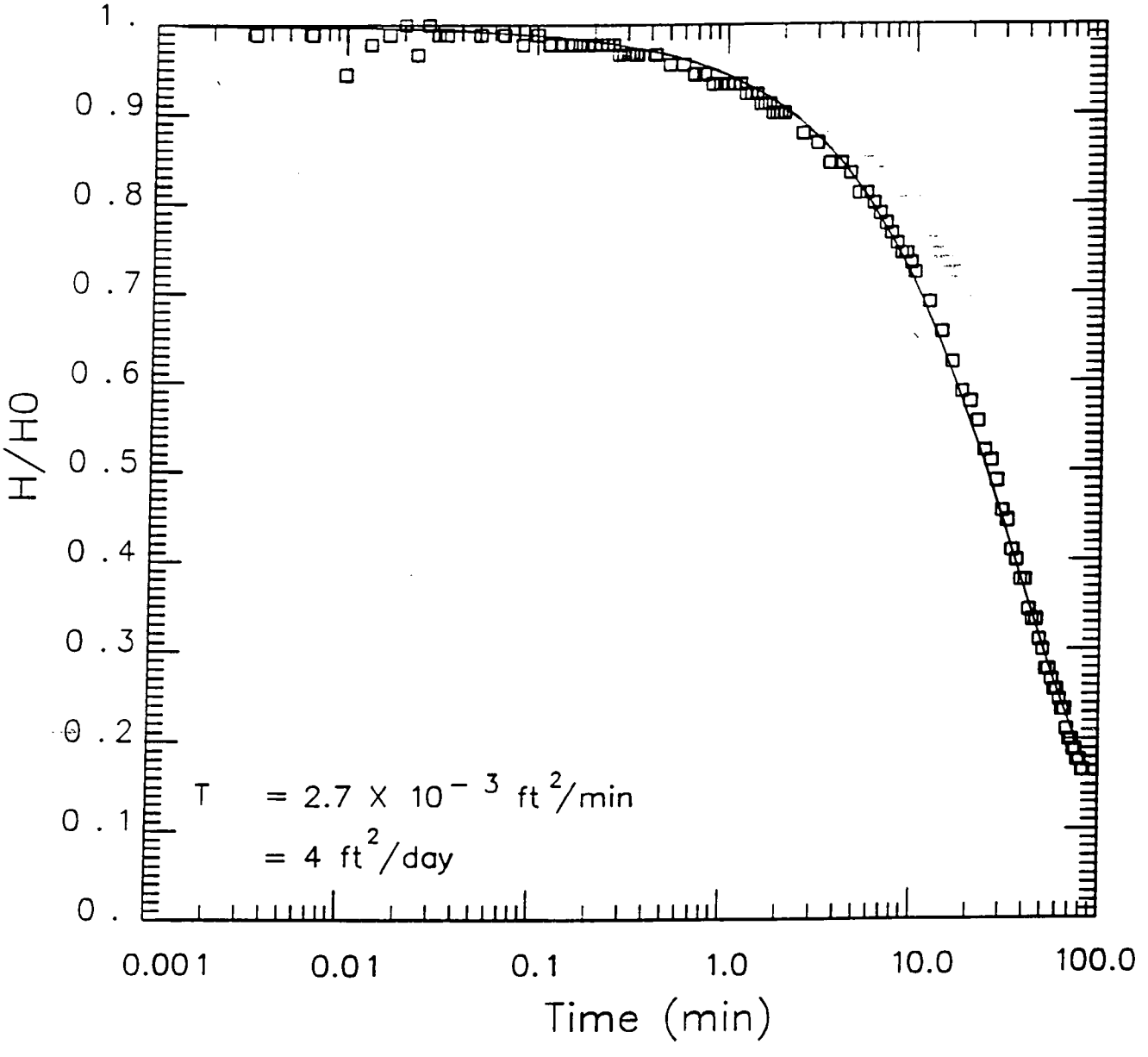
INPUT 1: Level (F)

Reference	15.88
Scale factor	10.01
Offset	0.00

Step# 0 02/26 10:50

Elapsed Time	Value
0.0000	15.07
0.0033	15.09
0.0066	15.06
0.0099	15.05
0.0133	15.06
0.0166	15.05
0.0200	15.04
0.0233	15.07
0.0266	15.07
0.0300	15.06
0.0333	15.06
0.0500	15.08
0.0666	15.09
0.0833	15.08
0.1000	15.09
0.1166	15.09
0.1333	15.09
0.1500	15.09
0.1666	15.10
0.1833	15.10
0.2000	15.10
0.2166	15.10
0.2333	15.10
0.2500	15.10
0.2666	15.10
0.2833	15.11
0.3000	15.11
0.3166	15.11
0.3333	15.11
0.4167	15.12
0.5000	15.13
0.5833	15.15
0.6667	15.16
0.7500	15.16
0.8333	15.17
0.9167	15.18
1.0000	15.19
1.0833	15.20
1.1667	15.21
1.2500	15.22
1.3333	15.22
1.4166	15.23
1.5000	15.24
1.5833	15.25
1.6667	15.26
1.7500	15.26
1.8333	15.27
1.9167	15.28
2.0000	15.28
2.5000	15.33
3.0000	15.36
3.5000	15.39
4.0000	15.42
4.5000	15.45
5.0000	15.47
5.5000	15.49
6.0000	15.51
6.5000	15.53
7.0000	15.55
7.5000	15.57
8.0000	15.58
8.5000	15.59
9.0000	15.61
9.5000	15.62
10.0000	15.63
12.0000	15.68
14.0000	15.70
16.0000	15.73
18.0000	15.75
20.0000	15.77
22.0000	15.78
24.0000	15.79
26.0000	15.81
28.0000	15.81
30.0000	15.82
32.0000	15.82
34.0000	15.83
36.0000	15.83
38.0000	15.83
40.0000	15.84
42.0000	15.85
44.0000	15.85
46.0000	15.85
48.0000	15.85
50.0000	15.86
52.0000	15.85
54.0000	15.85
56.0000	15.85
58.0000	15.86
60.0000	15.86
62.0000	15.86
64.0000	15.86
66.0000	15.86

Slug Extraction Well 2D-MW-16D



SE1000B
Environmental Logger
02/26 14:56

Unit# 00000 Test# 0

INPUT 1: Level (F)

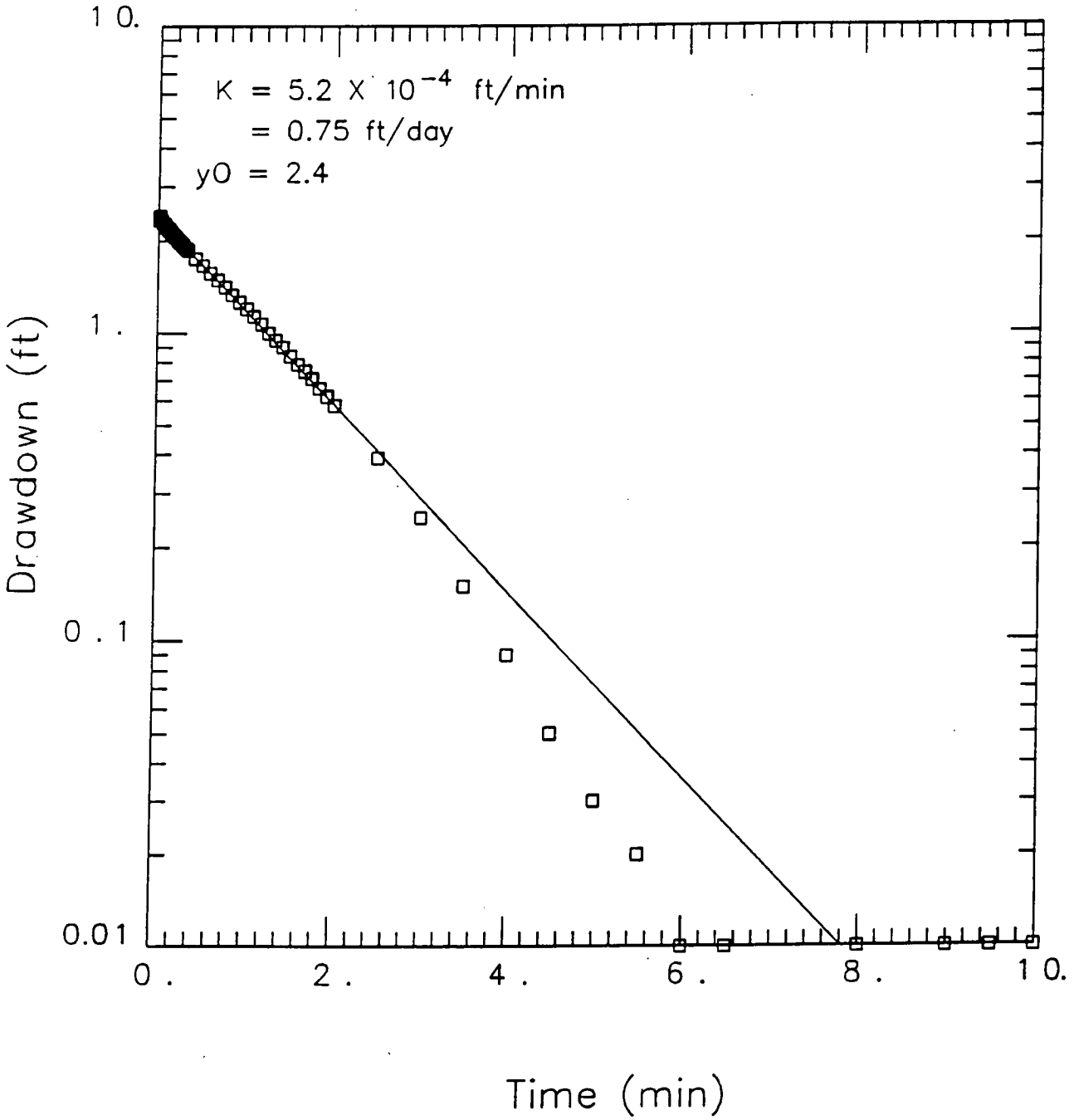
Reference	15.79
Scale factor	10.01
Offset	0.00

Step# 0 02/25 12:04

Elapsed Time	Value
0.0000	14.89
0.0033	14.90
0.0066	14.90
0.0099	14.94
0.0133	14.91
0.0166	14.90
0.0200	14.89
0.0233	14.92
0.0266	14.89
0.0300	14.90
0.0333	14.90
0.0500	14.90
0.0666	14.90
0.0833	14.91
0.1000	14.90
0.1166	14.91
0.1333	14.91
0.1500	14.91
0.1666	14.91
0.1833	14.91
0.2000	14.91
0.2166	14.91
0.2333	14.91
0.2500	14.91
0.2666	14.92
0.2833	14.92
0.3000	14.92
0.3166	14.92
0.3333	14.92
0.4167	14.92
0.5000	14.93
0.5833	14.93
0.6667	14.94
0.7500	14.94
0.8333	14.95
0.9167	14.95
1.0000	14.95
1.0833	14.95
1.1667	14.95
1.2500	14.96
1.3333	14.96
1.4166	14.96
1.5000	14.97
1.5833	14.97
1.6667	14.97
1.7500	14.98
1.8333	14.98
1.9167	14.98
2.0000	14.98
2.5000	15.00
3.0000	15.01
3.5000	15.03
4.0000	15.03
4.5000	15.04
5.0000	15.06
5.5000	15.06
6.0000	15.07
6.5000	15.08
7.0000	15.09
7.5000	15.10
8.0000	15.11
8.5000	15.12
9.0000	15.12
9.5000	15.13
10.0000	15.14
12.0000	15.17
14.0000	15.20
16.0000	15.23
18.0000	15.26
20.0000	15.27
22.0000	15.29
24.0000	15.32
26.0000	15.33
28.0000	15.35
30.0000	15.38
32.0000	15.39
34.0000	15.42
36.0000	15.43
38.0000	15.45
40.0000	15.45
42.0000	15.48
44.0000	15.49
46.0000	15.49
48.0000	15.51
50.0000	15.52
52.0000	15.54
54.0000	15.54
56.0000	15.55
58.0000	15.56
60.0000	15.56
62.0000	15.57
64.0000	15.58
66.0000	15.58
68.0000	15.60
70.0000	15.61
72.0000	15.6
74.0000	15.6
76.0000	15.62
78.0000	15.63
80.0000	15.63
82.0000	15.64
84.0000	15.64

OVER BANK DISPOSAL AREA (OBDA)

Slug Extraction Well 3-MW-12S



SE1000B
Environmental Logger
02/20 17:41

Unit# 00000 Test# 3

INPUT 1: Level (F)

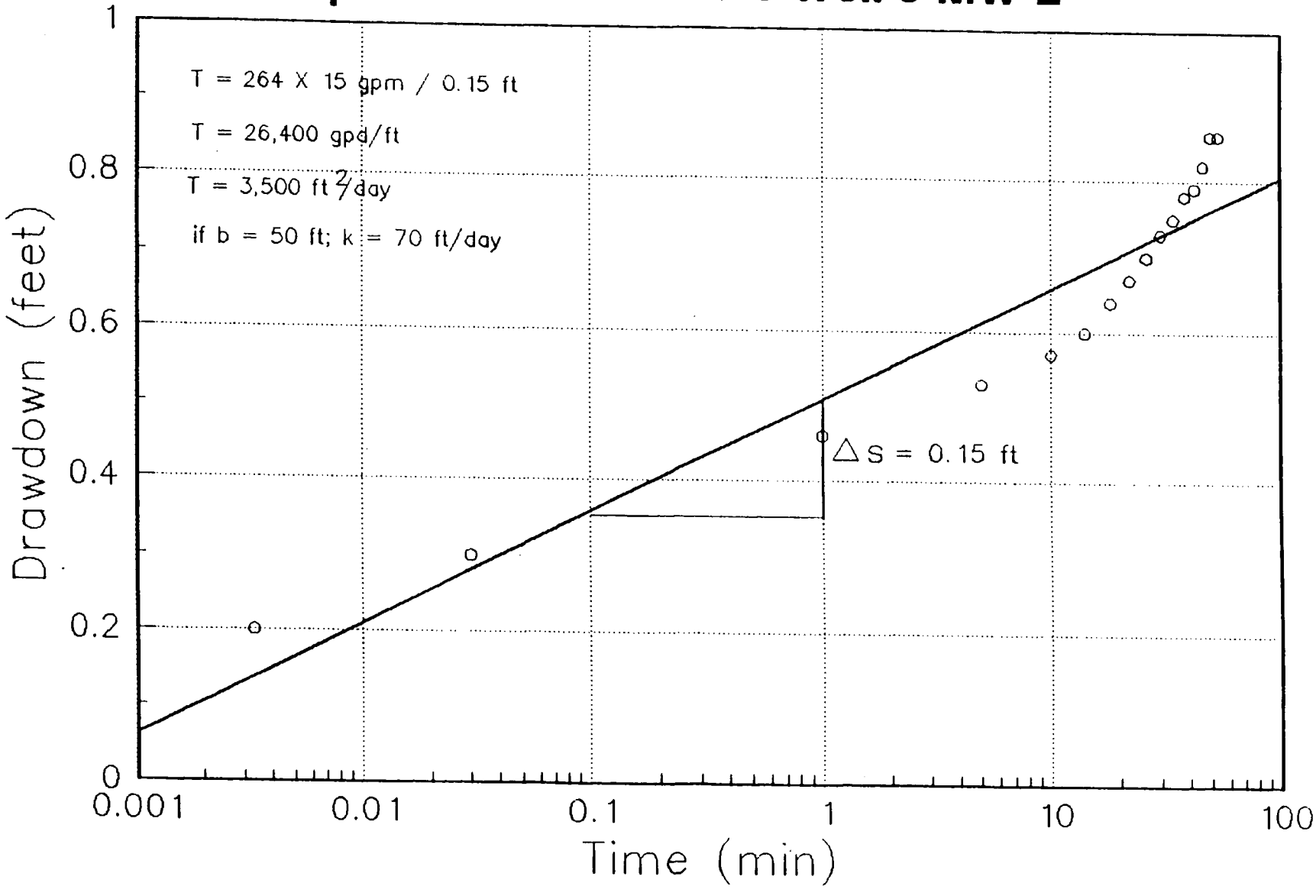
Reference	12.27
Scale factor	10.01
Offset	0.00

Step# 0 02/20 10:38

Elapsed Time	Value
0.0000	9.52
0.0033	9.94
0.0066	9.88
0.0099	9.88
0.0133	9.87
0.0166	9.95
0.0200	9.91
0.0233	9.92
0.0266	9.93
0.0300	9.94
0.0333	9.95
0.0500	9.99
0.0666	10.02
0.0833	10.05
0.1000	10.08
0.1166	10.10
0.1333	10.13
0.1500	10.16
0.1666	10.18
0.1833	10.21
0.2000	10.23
0.2166	10.26
0.2333	10.28
0.2500	10.30
0.2666	10.33
0.2833	10.35
0.3000	10.37
0.3166	10.39
0.3333	10.41
0.4167	10.52
0.5000	10.61
0.5833	10.70
0.6667	10.78
0.7500	10.86
0.8333	10.94
0.9167	11.01
1.0000	11.07
1.0833	11.14
1.1667	11.20
1.2500	11.27
1.3333	11.32
1.4166	11.37
1.5000	11.43
1.5833	11.48
1.6667	11.52
1.7500	11.56
1.8333	11.61
1.9167	11.65
2.0000	11.69
2.5000	11.88
3.0000	12.02
3.5000	12.12
4.0000	12.18
4.5000	12.22
5.0000	12.24
5.5000	12.25
6.0000	12.26
6.5000	12.26
7.0000	12.27
7.5000	12.27
8.0000	12.26
8.5000	12.27
9.0000	12.26
9.5000	12.26
10.0000	12.26

DEFENSE REUTILIZATION AND MARKETING OFFICE (DRMO)

Pump Test Drawdown for Well 6-MW-2



SE1000B
Environmental Logger
01/29 16:54

Unit# 00000 Test# 2

INPUT 1: Level (F)

Reference	8.05
Scale factor	10.01
Offset	0.00

Step# 0 01/29 14:11

Elapsed Time	Value
0.0000	7.86
0.0033	7.85
0.0066	7.85
0.0099	7.86
0.0133	7.86
0.0166	7.86
0.0200	7.86
0.0233	7.86
0.0266	7.86
0.0300	7.75
0.0333	7.51
0.0500	7.60
0.0666	7.56
0.0833	7.57
0.1000	7.58
0.1166	7.58
0.1333	7.60
0.1500	7.59
0.1666	7.58
0.1833	7.59
0.2000	7.59
0.2166	7.60
0.2333	7.59
0.2500	7.60
0.2666	7.60
0.2833	7.60
0.3000	7.60
0.3166	7.60
0.3333	7.61
0.4167	7.60
0.5000	7.60
0.5833	7.58
0.6667	7.59
0.7500	7.58
0.8333	7.58
0.9167	7.58
1.0000	7.59
1.0833	7.57
1.1667	7.58
1.2500	7.58
1.3333	7.57
1.4166	7.56
1.5000	7.58
1.5833	7.58
1.6667	7.57
1.7500	7.56
1.8333	7.56
1.9167	7.56
2.0000	7.56
2.5000	7.55
3.0000	7.54
3.5000	7.55
4.0000	7.54
4.5000	7.52
5.0000	7.52
5.5000	7.52
6.0000	7.51
6.5000	7.52
7.0000	7.50
7.5000	7.51
8.0000	7.50
8.5000	7.49
9.0000	7.49
9.5000	7.48
10.0000	7.48
12.0000	7.47
14.0000	7.45
16.0000	7.42
18.0000	7.41
20.0000	7.39
22.0000	7.38
24.0000	7.37
26.0000	7.35
28.0000	7.34
30.0000	7.32
32.0000	7.31
34.0000	7.30
36.0000	7.28
38.0000	7.27
40.0000	7.27
42.0000	7.26
44.0000	7.24
46.0000	7.23
48.0000	7.20
50.0000	7.19
52.0000	7.19
54.0000	7.19
56.0000	7.20
58.0000	7.18
60.0000	7.16
62.0000	7.16

SE1000B
Environmental Logger
01/29 16:55

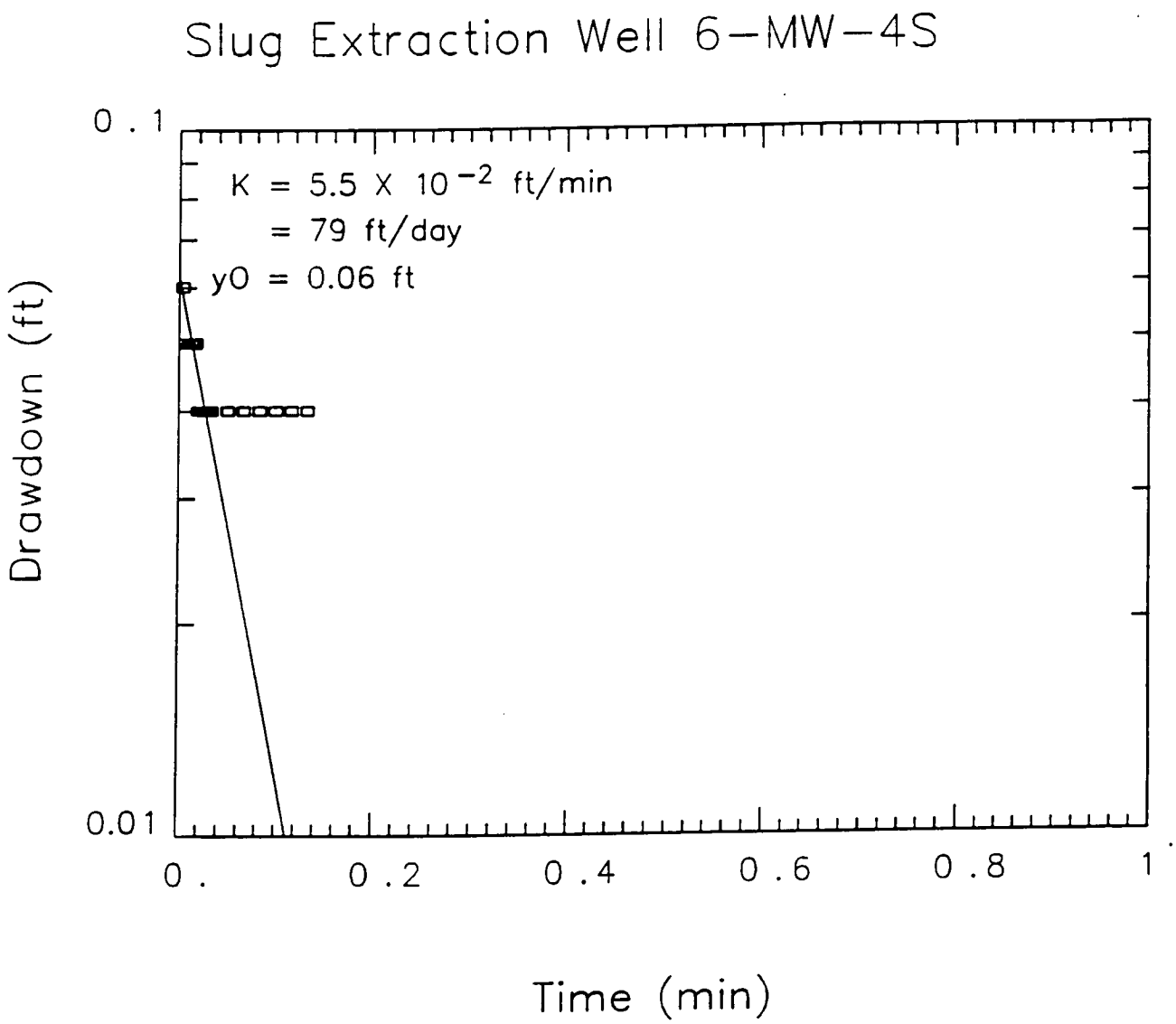
Unit# 00000 Test# 3

INPUT 1: Level (F)

Reference	8.05
Scale factor	10.01
Offset	0.00

Step# 0 01/29 15:15

Elapsed Time	Value
0.0000	7.39
0.0033	7.36
0.0066	7.37
0.0099	7.38
0.0133	7.38
0.0166	7.39
0.0200	7.39
0.0233	7.40
0.0266	7.40
0.0300	7.40
0.0333	7.40
0.0500	7.41
0.0666	7.40
0.0833	7.40
0.1000	7.40
0.1166	7.40
0.1333	7.40
0.1500	7.40
0.1666	7.40
0.1833	7.40
0.2000	7.40
0.2166	7.40
0.2333	7.40
0.2500	7.40
0.2666	7.40
0.2833	7.40
0.3000	7.40
0.3166	7.40
0.3333	7.40
0.4167	7.40
0.5000	7.41
0.5833	7.40
0.6667	7.40
0.7500	7.41
0.8333	7.41
0.9167	7.41
1.0000	7.41
1.0833	7.40
1.1667	7.40
1.2500	7.40
1.3333	7.40
1.4166	7.40
1.5000	7.40
1.5833	7.40
1.6667	7.40
1.7500	7.40
1.8333	7.40
1.9167	7.40
2.0000	7.40
2.5000	7.41
3.0000	7.41
3.5000	7.41
4.0000	7.41
4.5000	7.41
5.0000	7.41
5.5000	7.41
6.0000	7.41
6.5000	7.41
7.0000	7.41
7.5000	7.41
8.0000	7.40
8.5000	7.40
9.0000	7.40
9.5000	7.40
10.0000	7.40
12.0000	7.39
14.0000	7.39


Slug Extraction Well 6-MW-4S
K = 5.5 X 10 -2 ft/min
= 79 ft/day
y0 = 0.06 ft
0 . 1
0.01
Drawdown (ft)
0 .
0 . 2
0 . 4
0 . 6
0 . 8
1
Time (min)

SE1000B
Environmental Logger
02/22 14:54

Unit# 00000 Test# 0

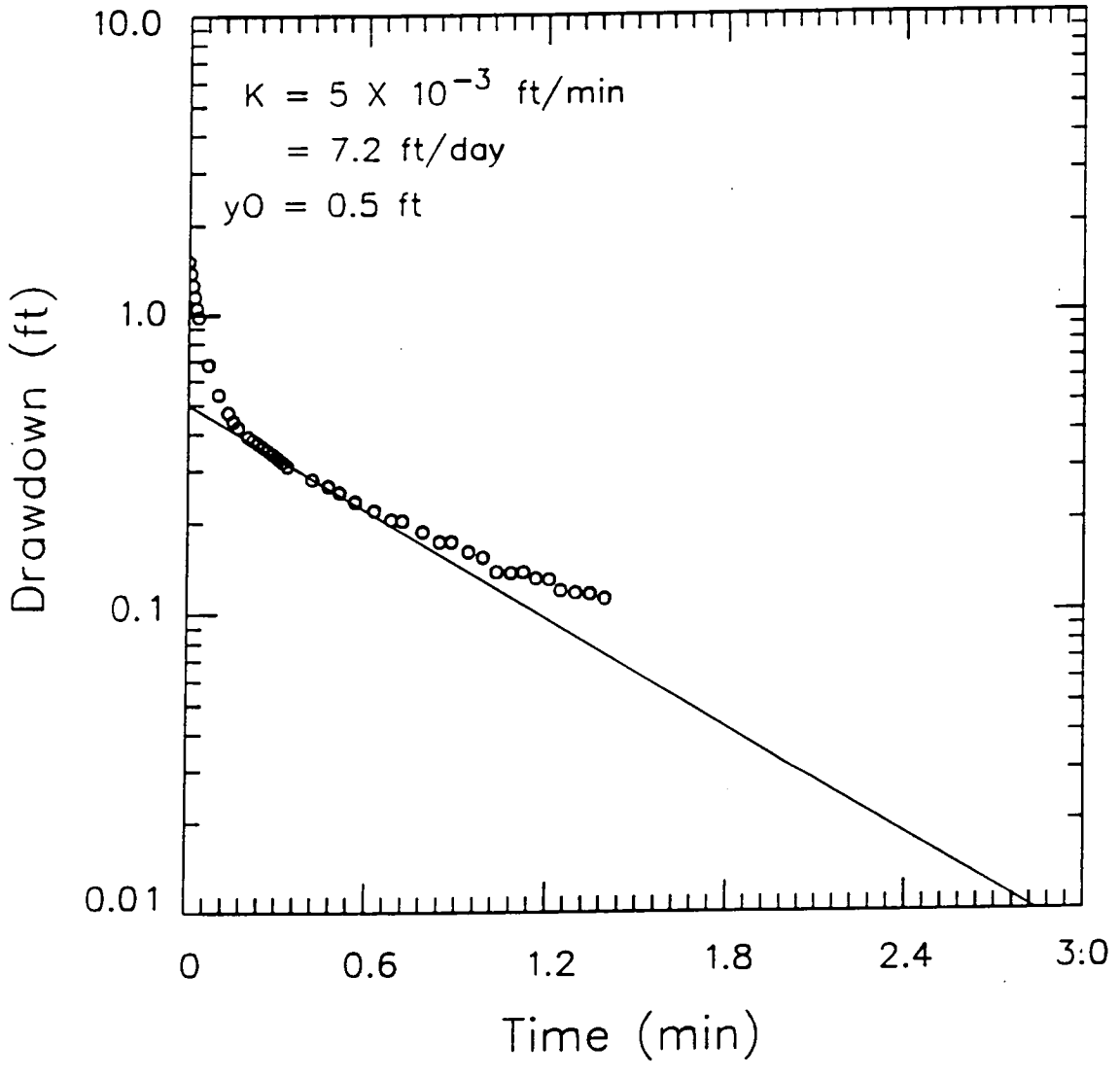
INPUT 1: Level (F)

Reference	8.36
Scale factor	10.01
Offset	0.00

Step# 0 02/21 09:47

Elapsed Time	Value
0.0000	8.30
0.0033	8.30
0.0066	8.31
0.0099	8.31
0.0133	8.31
0.0166	8.31
0.0200	8.32
0.0233	8.32
0.0266	8.32
0.0300	8.32
0.0333	8.32
0.0500	8.32
0.0666	8.32
0.0833	8.32
0.1000	8.32
0.1166	8.32
0.1333	8.32
0.1500	8.31
0.1666	8.31
0.1833	8.31
0.2000	8.31
0.2166	8.31
0.2333	8.31
0.2500	8.31
0.2666	8.31
0.2833	8.31
0.3000	8.31
0.3166	8.31
0.3333	8.31
0.4167	8.31
0.5000	8.31
0.5833	8.30
0.6667	8.30
0.7500	8.30
0.8333	8.30
0.9167	8.30
1.0000	8.30
1.0833	8.30
1.1667	8.30
1.2500	8.30
1.3333	8.30
1.4166	8.30
1.5000	8.30
1.5833	8.30
1.6667	8.30
1.7500	8.30
1.8333	8.30
1.9167	8.30
2.0000	8.30
2.5000	8.30
3.0000	8.29
3.5000	8.29
4.0000	8.29
4.5000	8.29
5.0000	8.29
5.5000	8.29
6.0000	8.29
6.5000	8.29
7.0000	8.28
7.5000	8.28
8.0000	8.28
8.5000	8.27
9.0000	8.27
9.5000	8.27
10.0000	8.26
12.0000	8.27
14.0000	8.26
16.0000	8.26
18.0000	8.26
20.0000	8.26
22.0000	8.25

Slug Extraction Well 6-MW-5S



SE10000B
Environmental Logger
02/22 14:57

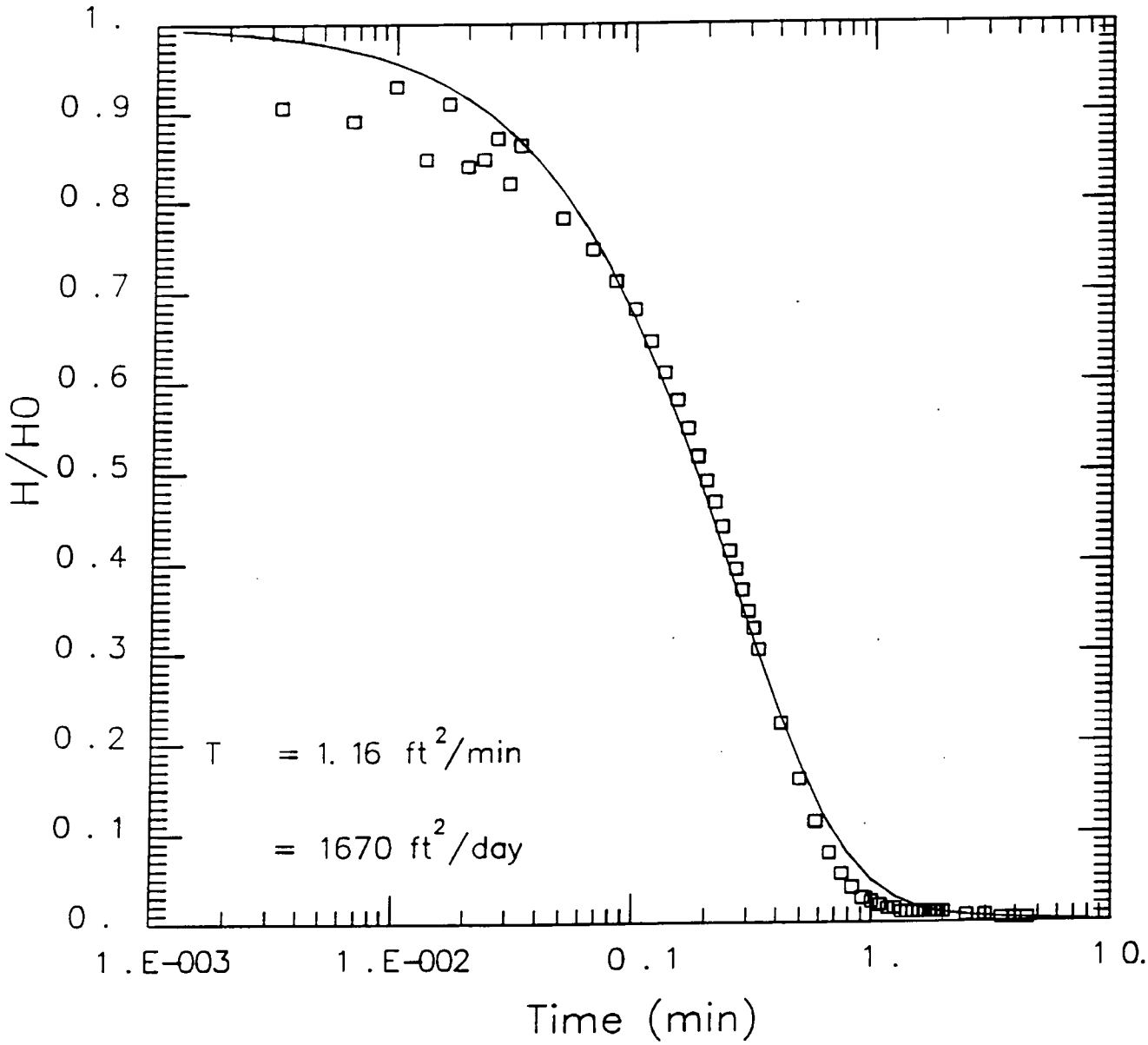
Unit # 00000 Test #1
INPUT 1: Level (F)

Reference 5.53
Scale Factor 10.01
Offset 0.00

Step# 0 02/21 11:04

Elapsed Time	Value
0.0000	4.02
0.0033	4.05
0.0066	4.15
0.0099	4.22
0.0133	4.27
0.0166	4.33
0.0200	4.38
0.0233	4.43
0.0266	4.48
0.0300	4.52
0.0333	4.55
0.0500	4.73
0.0666	4.85
0.0833	4.94
0.1000	4.99
0.1166	5.03
0.1333	5.06
0.1500	5.09
0.1666	5.11
0.1833	5.12
0.2000	5.14
0.2166	5.15
0.2333	5.16
0.2500	5.17
0.2666	5.18
0.2833	5.19
0.3000	5.20
0.3166	5.21
0.3333	5.22
0.4167	5.25
0.5000	5.27
0.5833	5.29
0.6667	5.31
0.7500	5.33
0.8333	5.35
0.9167	5.35
1.0000	5.37
1.0833	5.38
1.1667	5.38
1.2500	5.39
1.3333	5.40
1.4166	5.41
1.5000	5.41
1.5833	5.41
1.6667	5.42
1.7500	5.42
1.8333	5.43
1.9167	5.43
2.0000	5.43
2.5000	5.45
3.0000	5.46
3.5000	5.46
4.0000	5.47
4.5000	5.47
5.0000	5.47
5.5000	5.47
6.0000	5.47
6.5000	5.47
7.0000	5.47
7.5000	5.47
8.0000	5.47
8.5000	5.47
9.0000	5.47
9.5000	5.47
10.0000	5.47
12.0000	5.47
14.0000	5.47
16.0000	5.46
18.0000	5.46
20.0000	5.47
22.0000	5.46
24.0000	5.47
26.0000	5.47
28.0000	5.47
30.0000	5.47
32.0000	5.47
34.0000	5.47
36.0000	5.47
38.0000	5.47
40.0000	5.47
42.0000	5.48
44.0000	5.47
46.0000	5.47
48.0000	5.46
50.0000	5.47
52.0000	5.47
54.0000	5.46
56.0000	5.47
58.0000	5.47
60.0000	5.47
62.0000	5.47
64.0000	5.47

Recovery Data for Well 6-MW-5D



SE1000B
Environmental Logger
01/29 16:51

Unit# 00000 Test# 0

INPUT 1: Level (F)

Reference	20.21
Scale factor	10.01
Offset	0.00

Step# 0 01/29 10:06

Elapsed Time	Value
0.0000	20.18
0.0033	20.13
0.0066	20.11
0.0099	20.12
0.0133	20.07
0.0166	20.04
0.0200	20.05
0.0233	20.04
0.0266	20.03
0.0300	20.01
0.0333	19.98
0.0500	19.88
0.0666	19.78
0.0833	19.69
0.1000	19.61
0.1166	19.54
0.1333	19.45
0.1500	19.39
0.1666	19.32
0.1833	19.26
0.2000	19.19
0.2166	19.14
0.2333	19.09
0.2500	19.03
0.2666	18.98
0.2833	18.93
0.3000	18.89
0.3166	18.84
0.3333	18.80
0.4167	18.61
0.5000	18.46
0.5833	18.33
0.6667	18.23
0.7500	18.14
0.8333	18.07
0.9167	18.01
1.0000	17.96
1.0833	17.92
1.1667	17.89
1.2500	17.87
1.3333	17.84
1.4166	17.83
1.5000	17.81
1.5833	17.80
1.6667	17.79
1.7500	17.78
1.8333	17.77
1.9167	17.76
2.0000	17.76
2.5000	17.74
3.0000	17.74
3.5000	17.74
4.0000	17.73
4.5000	17.72
5.0000	17.73
5.5000	17.72
6.0000	17.72
6.5000	17.72
7.0000	17.73
7.5000	17.73
8.0000	17.72
8.5000	17.73
9.0000	17.72
9.5000	17.72
10.0000	17.72
12.0000	17.72
14.0000	17.73
16.0000	17.72
18.0000	17.73
20.0000	17.73
22.0000	17.72
24.0000	17.73
26.0000	17.73
28.0000	17.73
30.0000	17.73
32.0000	17.72
34.0000	17.72
36.0000	17.72
38.0000	17.73
40.0000	17.73
42.0000	17.73
44.0000	17.73
46.0000	17.73
48.0000	17.73
50.0000	17.74
52.0000	17.74
54.0000	17.74
56.0000	17.74
58.0000	17.74
60.0000	17.74

SE1000B
Environmental Logger
01/29 16:52

Unit# 00000 Test# 1

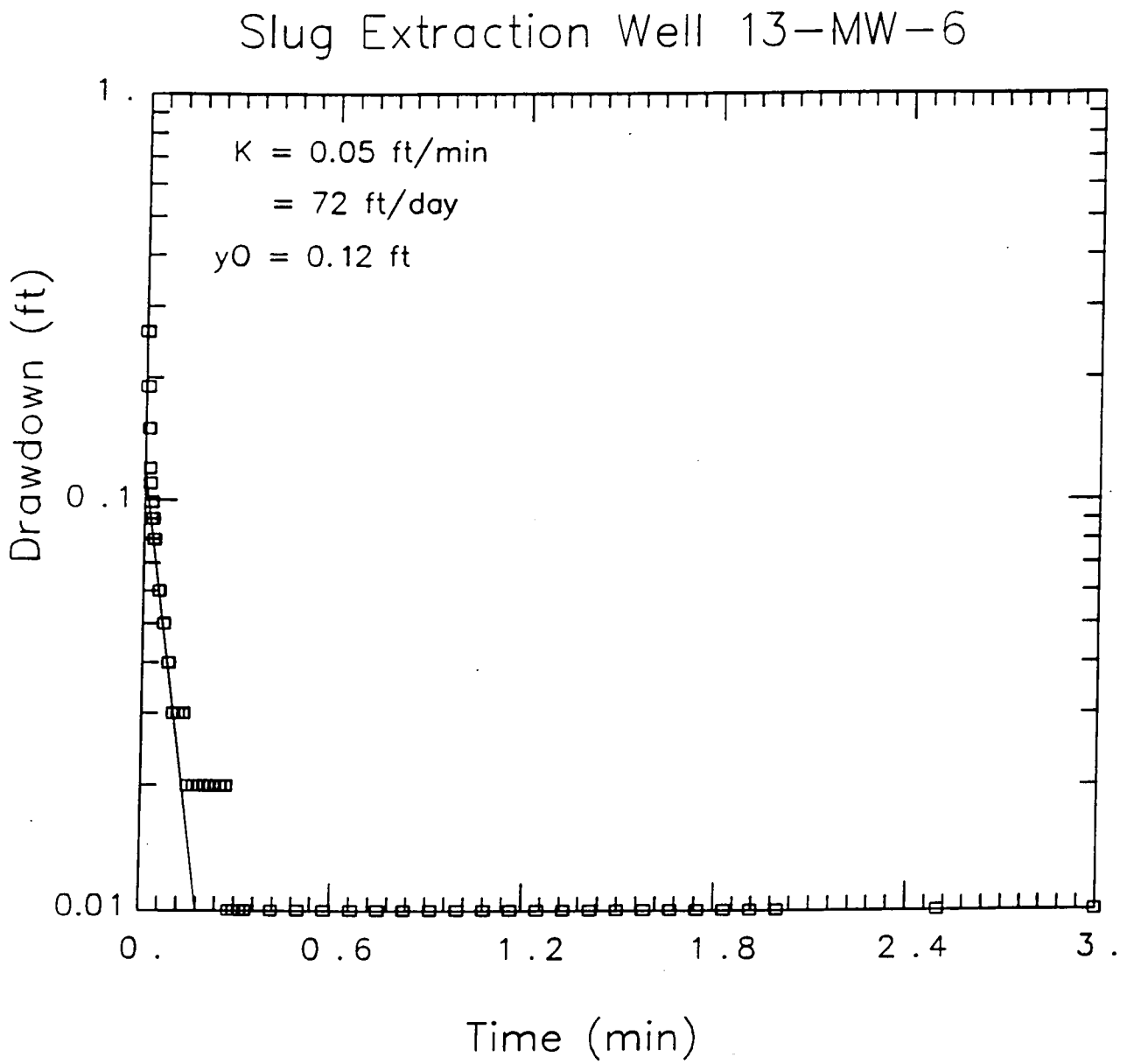
INPUT 1: Level (F)

Reference 20.21
Scale factor 10.01
Offset 0.00

Step# 0 01/29 11:07

Elapsed Time	Value		
0.0000	17.64	1.1667	20.17
0.0033	17.88	1.2500	20.17
0.0066	17.92	1.3333	20.18
0.0099	17.82	1.4166	20.18
0.0133	18.03	1.5000	20.18
0.0166	17.87	1.5833	20.18
0.0200	18.05	1.6667	20.18
0.0233	18.03	1.7500	20.18
0.0266	17.97	1.8333	20.18
0.0300	18.10	1.9167	20.18
0.0333	17.99	2.0000	20.18
0.0500	18.20	2.5000	20.19
0.0666	18.29	3.0000	20.19
0.0833	18.38	3.5000	20.20
0.1000	18.46	4.0000	20.20
0.1166	18.55	4.5000	20.20
0.1333	18.64	5.0000	20.21
0.1500	18.72	5.5000	20.21
0.1666	18.80	6.0000	20.21
0.1833	18.88	6.5000	20.21
0.2000	18.95	7.0000	20.21
0.2166	19.01	7.5000	20.21
0.2333	19.08	8.0000	20.22
0.2500	19.15	8.5000	20.22
0.2666	19.20	9.0000	20.22
0.2833	19.26	9.5000	20.22
0.3000	19.32	10.0000	20.22
0.3166	19.37		
0.3333	19.43		
0.4167	19.64		
0.5000	19.80		
0.5833	19.92		
0.6667	20.01		
0.7500	20.07		
0.8333	20.11		
0.9167	20.14		
1.0000	20.15		
1.0833	20.16		

LOWER SUBASE


Slug Extraction Well 13-MW-6
K = 0.05 ft/min
= 72 ft/day
y0 = 0.12 ft
Drawdown (ft)
1.
0.1
0.01
0.
0.6
1.2
1.8
2.4
3.
Time (min)

SE1000B
Environmental Logger
03/01 09:21

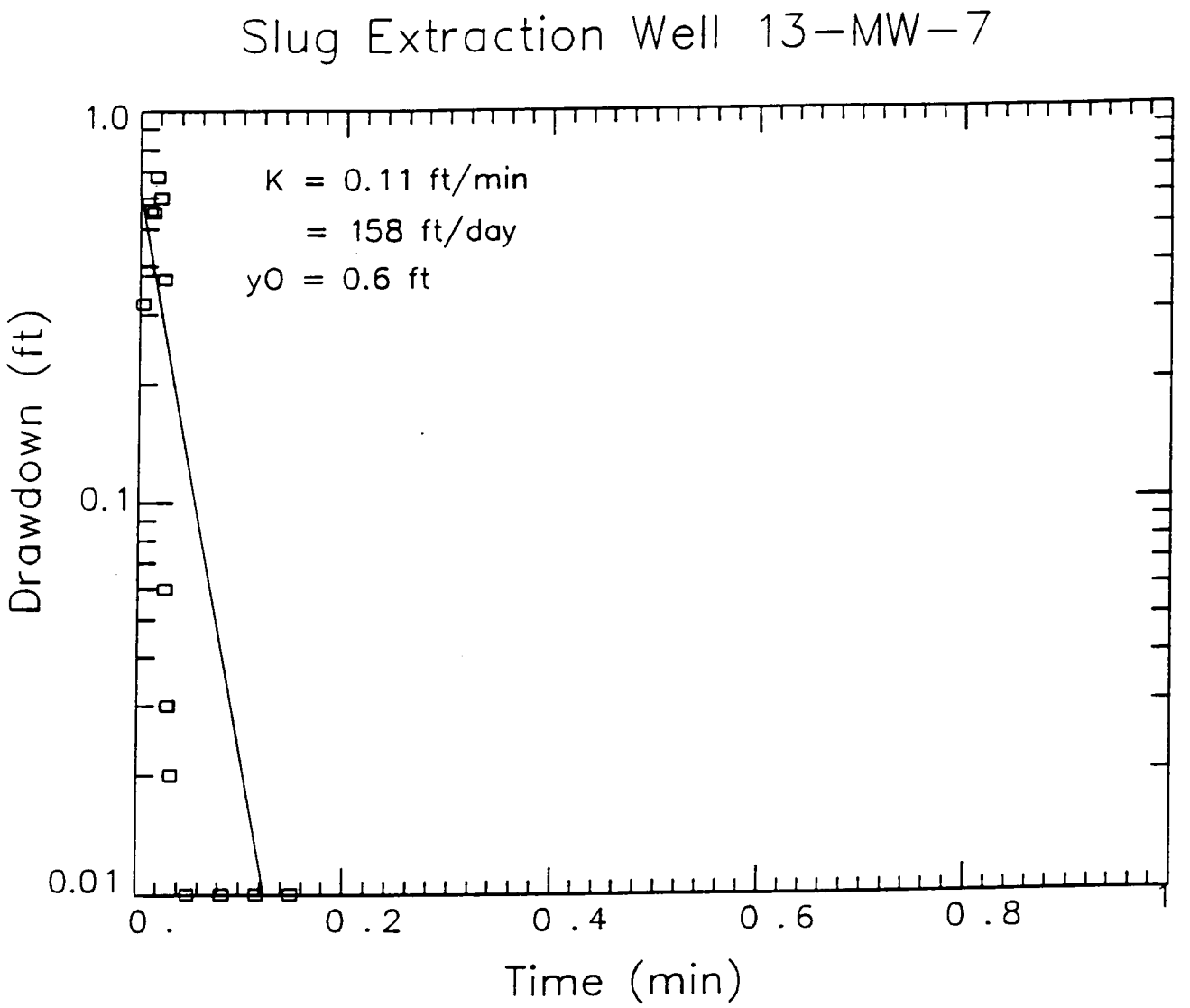
Unit# 00000 Test# 4

INPUT 1: Level (F)

Reference	8.93
Scale factor	10.01
Offset	0.00

Step# 0 02/28 11:53

Elapsed Time	Value		
0.0000	8.57	1.1667	8.92
0.0033	8.67	1.2500	8.92
0.0066	8.74	1.3333	8.92
0.0099	8.78	1.4166	8.92
0.0133	8.81	1.5000	8.92
0.0166	8.82	1.5833	8.92
0.0200	8.83	1.6667	8.92
0.0233	8.84	1.7500	8.92
0.0266	8.84	1.8333	8.92
0.0300	8.85	1.9167	8.92
0.0333	8.85	2.0000	8.92
0.0500	8.87	2.5000	8.92
0.0666	8.88	3.0000	8.92
0.0833	8.89	3.5000	8.93
0.1000	8.90	4.0000	8.92
0.1166	8.90	4.5000	8.93
0.1333	8.90	5.0000	8.92
0.1500	8.91	5.5000	8.93
0.1666	8.91	6.0000	8.92
0.1833	8.91	6.5000	8.93
0.2000	8.91	7.0000	8.93
0.2166	8.91	7.5000	8.92
0.2333	8.91	8.0000	8.93
0.2500	8.91	8.5000	8.92
0.2666	8.91	9.0000	8.93
0.2833	8.92	9.5000	8.93
0.3000	8.92	10.0000	8.92
0.3166	8.92		
0.3333	8.92		
0.4167	8.92		
0.5000	8.92		
0.5833	8.92		
0.6667	8.92		
0.7500	8.92		
0.8333	8.92		
0.9167	8.92		
1.0000	8.92		
1.0833	8.92		


Slug Extraction Well 13-MW-7
K = 0.11 ft/min
= 158 ft/day
yO = 0.6 ft
1.0
0.1
0.01
Drawdown (ft)
0.
0.2
0.4
0.6
0.8
Time (min)

SE1000B
Environmental Logger
03/06 11:36

Unit# 01027 Test# 4

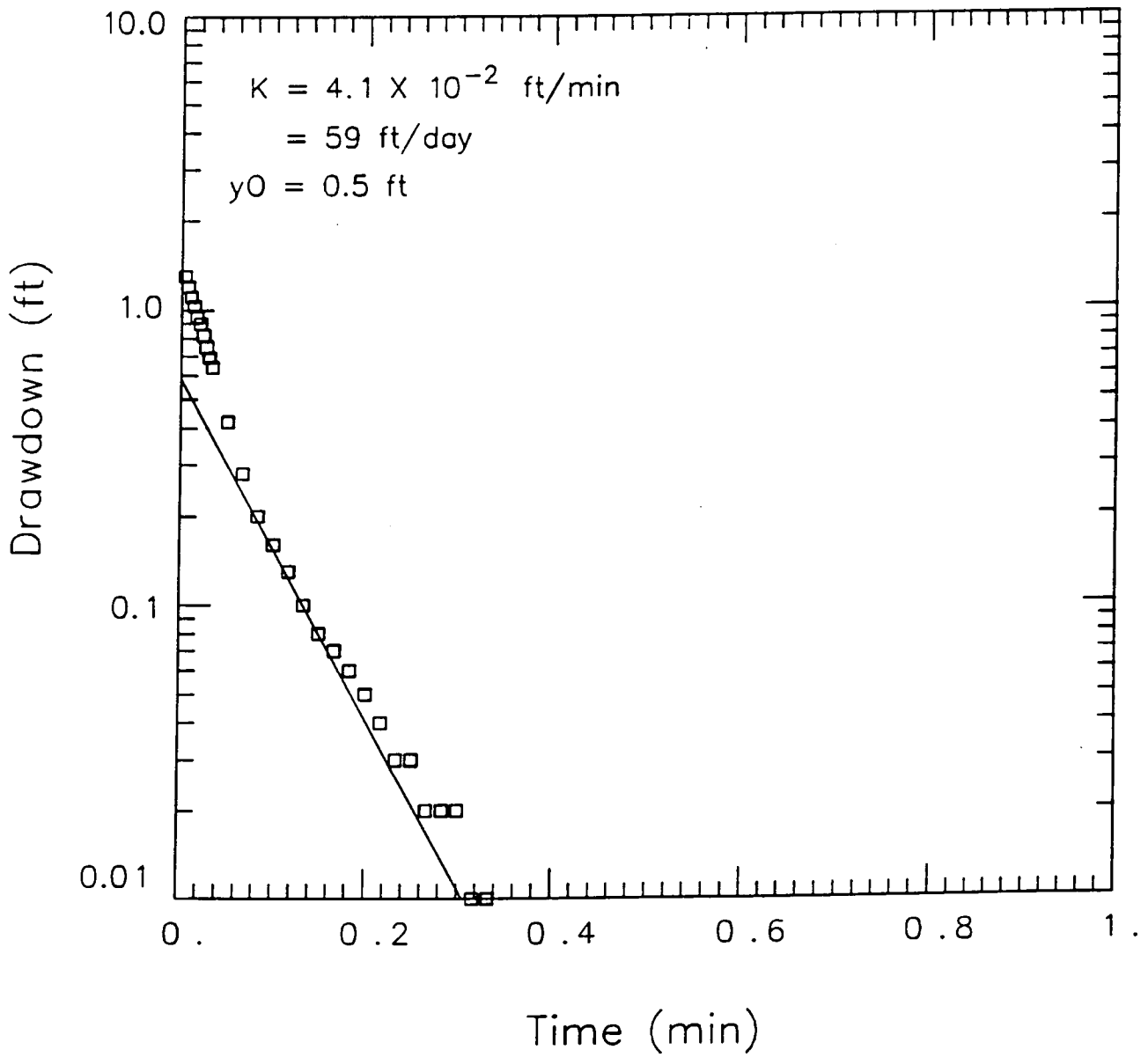
INPUT 1: Level (F)

Reference	9.49
Scale factor	10.01
Offset	0.00

Step# 0 03/04 13:24

Elapsed Time	Value
0.0000	9.04
0.0033	9.17
0.0066	9.10
0.0099	8.93
0.0133	8.94
0.0166	8.81
0.0200	8.89
0.0233	9.12
0.0266	9.43
0.0300	9.46
0.0333	9.47
0.0500	9.48
0.0666	9.49
0.0833	9.48
0.1000	9.49
0.1166	9.48
0.1333	9.49
0.1500	9.48
0.1666	9.49
0.1833	9.49
0.2000	9.49
0.2166	9.49
0.2333	9.49
0.2500	9.49
0.2666	9.49
0.2833	9.49
0.3000	9.49
0.3166	9.49
0.3333	9.49
0.4167	9.49
0.5000	9.50
0.5833	9.50
0.6667	9.50
0.7500	9.50
0.8333	9.50
0.9167	9.50
1.0000	9.50
1.0833	9.50
1.1667	9.50
1.2500	9.50
1.3333	9.50
1.4166	9.50
1.5000	9.50
1.5833	9.49
1.6667	9.50
1.7500	9.50
1.8333	9.50
1.9167	9.50
2.0000	9.50
2.5000	9.50
3.0000	9.50
3.5000	9.50
4.0000	9.50
4.5000	9.49
5.0000	9.49
5.5000	9.49
6.0000	9.49
6.5000	9.49
7.0000	9.50
7.5000	9.49
8.0000	9.50
8.5000	9.49
9.0000	9.49
9.5000	9.49
10.0000	9.49

Slug Extraction Well 13-MW-10



SE1000B
Environmental Logger
03/06 11:34

Unit# 01027 Test# 3

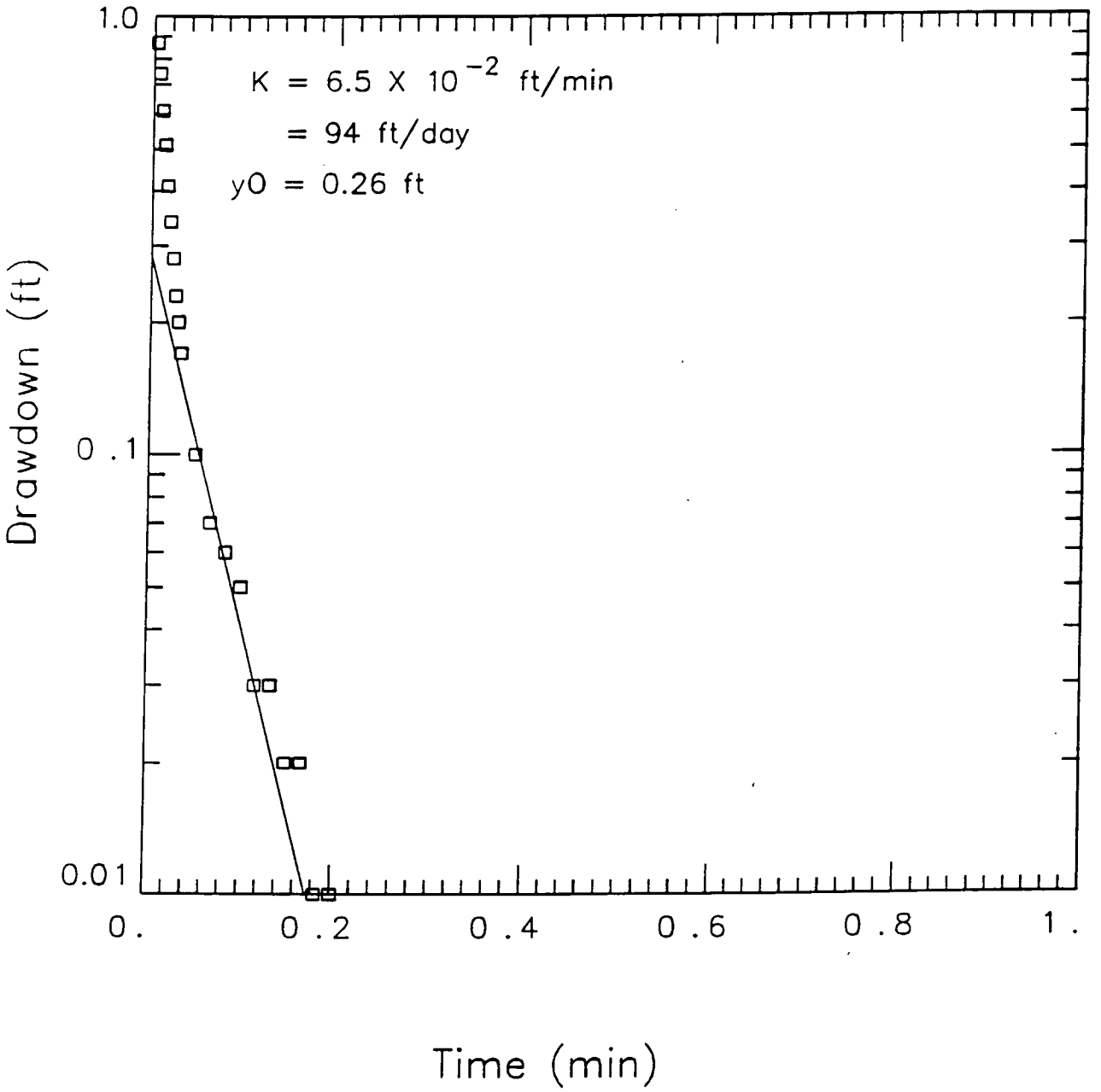
INPUT 1: Level (F)

Reference	9.53
Scale factor	10.01
Offset	0.00

Step# 0 03/04 11:16

Elapsed Time	Value
0.0000	8.13
0.0033	8.23
0.0066	8.33
0.0099	8.42
0.0133	8.50
0.0166	8.58
0.0200	8.63
0.0233	8.71
0.0266	8.78
0.0300	8.84
0.0333	8.89
0.0500	9.11
0.0666	9.25
0.0833	9.33
0.1000	9.37
0.1166	9.40
0.1333	9.43
0.1500	9.45
0.1666	9.46
0.1833	9.47
0.2000	9.48
0.2166	9.49
0.2333	9.50
0.2500	9.50
0.2666	9.51
0.2833	9.51
0.3000	9.51
0.3166	9.52
0.3333	9.52
0.4167	9.53
0.5000	9.53
0.5833	9.53
0.6667	9.53
0.7500	9.53
0.8333	9.53
0.9167	9.53
1.0000	9.53
1.0833	9.53
1.1667	9.53
1.2500	9.53
1.3333	9.53
1.4166	9.53
1.5000	9.53
1.5833	9.53
1.6667	9.54
1.7500	9.54
1.8333	9.53
1.9167	9.53
2.0000	9.53
2.5000	9.54
3.0000	9.54
3.5000	9.54
4.0000	9.54
4.5000	9.54
5.0000	9.54
5.5000	9.54
6.0000	9.54
6.5000	9.54
7.0000	9.54
7.5000	9.54
8.0000	9.54
8.5000	9.55
9.0000	9.55
9.5000	9.55
10.0000	9.55

Slug Extraction Well 13-MW-11



SE1000B
Environmental Logger
03/06 11:33

Unit# 01027 Test# 2

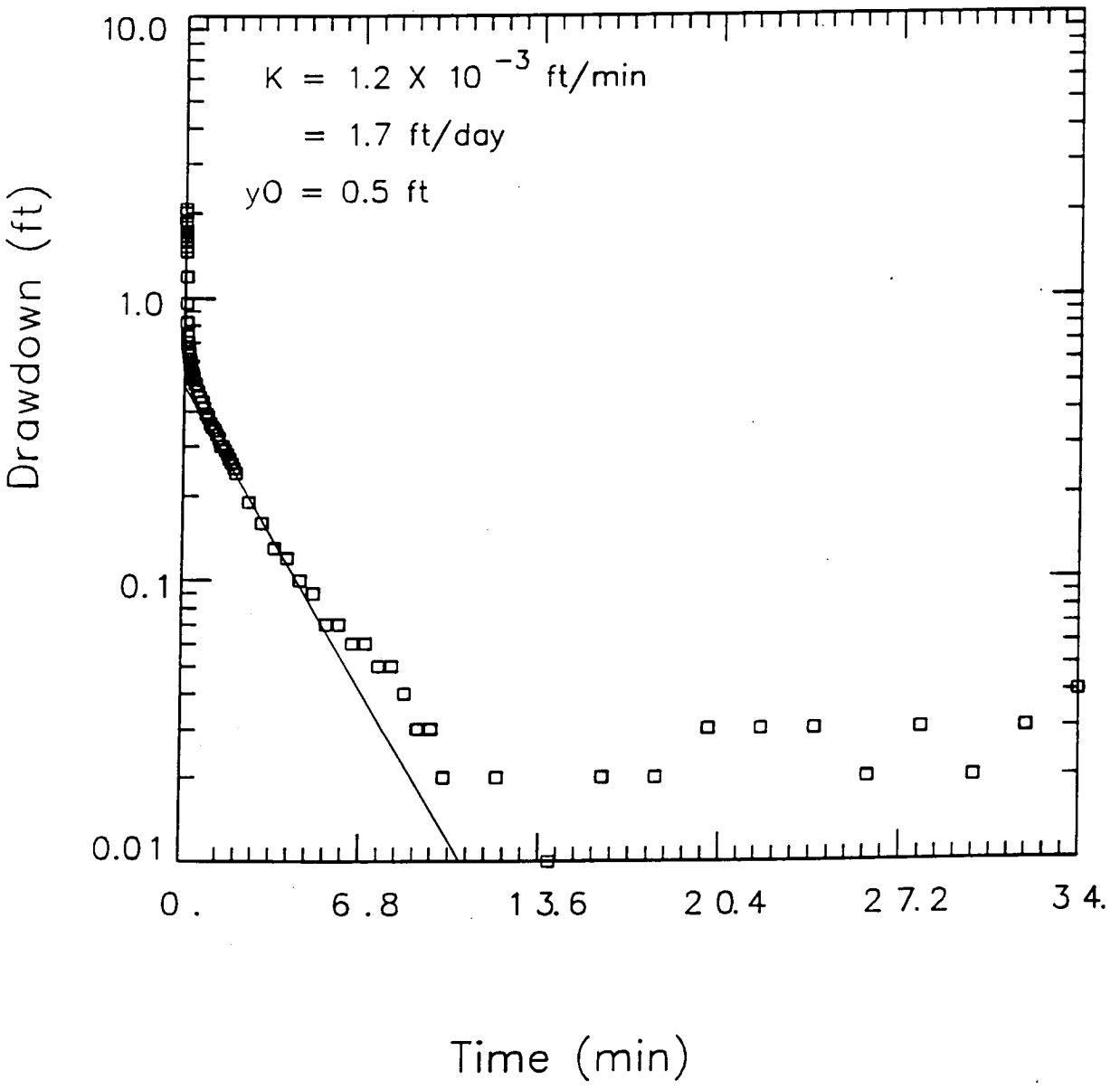
INPUT 1: Level (F)

Reference	7.90
Scale factor	10.01
Offset	0.00

Step# 0 03/04 10:54

Elapsed Time	Value
0.0000	6.83
0.0033	7.03
0.0066	7.16
0.0099	7.29
0.0133	7.39
0.0166	7.49
0.0200	7.56
0.0233	7.62
0.0266	7.67
0.0300	7.70
0.0333	7.73
0.0500	7.80
0.0666	7.83
0.0833	7.84
0.1000	7.85
0.1166	7.87
0.1333	7.87
0.1500	7.88
0.1666	7.88
0.1833	7.89
0.2000	7.89
0.2166	7.90
0.2333	7.90
0.2500	7.90
0.2666	7.90
0.2833	7.90
0.3000	7.90
0.3166	7.90
0.3333	7.90
0.4167	7.90
0.5000	7.90
0.5833	7.90
0.6667	7.90
0.7500	7.91
0.8333	7.91
0.9167	7.91
1.0000	7.91
1.0833	7.91
1.1667	7.91
1.2500	7.91
1.3333	7.91
1.4166	7.91
1.5000	7.91
1.5833	7.91
1.6667	7.91
1.7500	7.91
1.8333	7.91
1.9167	7.91
2.0000	7.91
2.5000	7.91
3.0000	7.91
3.5000	7.91
4.0000	7.91
4.5000	7.91
5.0000	7.92
5.5000	7.92
6.0000	7.92
6.5000	7.92
7.0000	7.92
7.5000	7.92
8.0000	7.93
8.5000	7.93
9.0000	7.93
9.5000	7.94
10.0000	7.94

Slug Extraction Well 13-MW-12



SE1000B
Environmental Logger
03/01 09:23

Unit# 00000 Test# 5

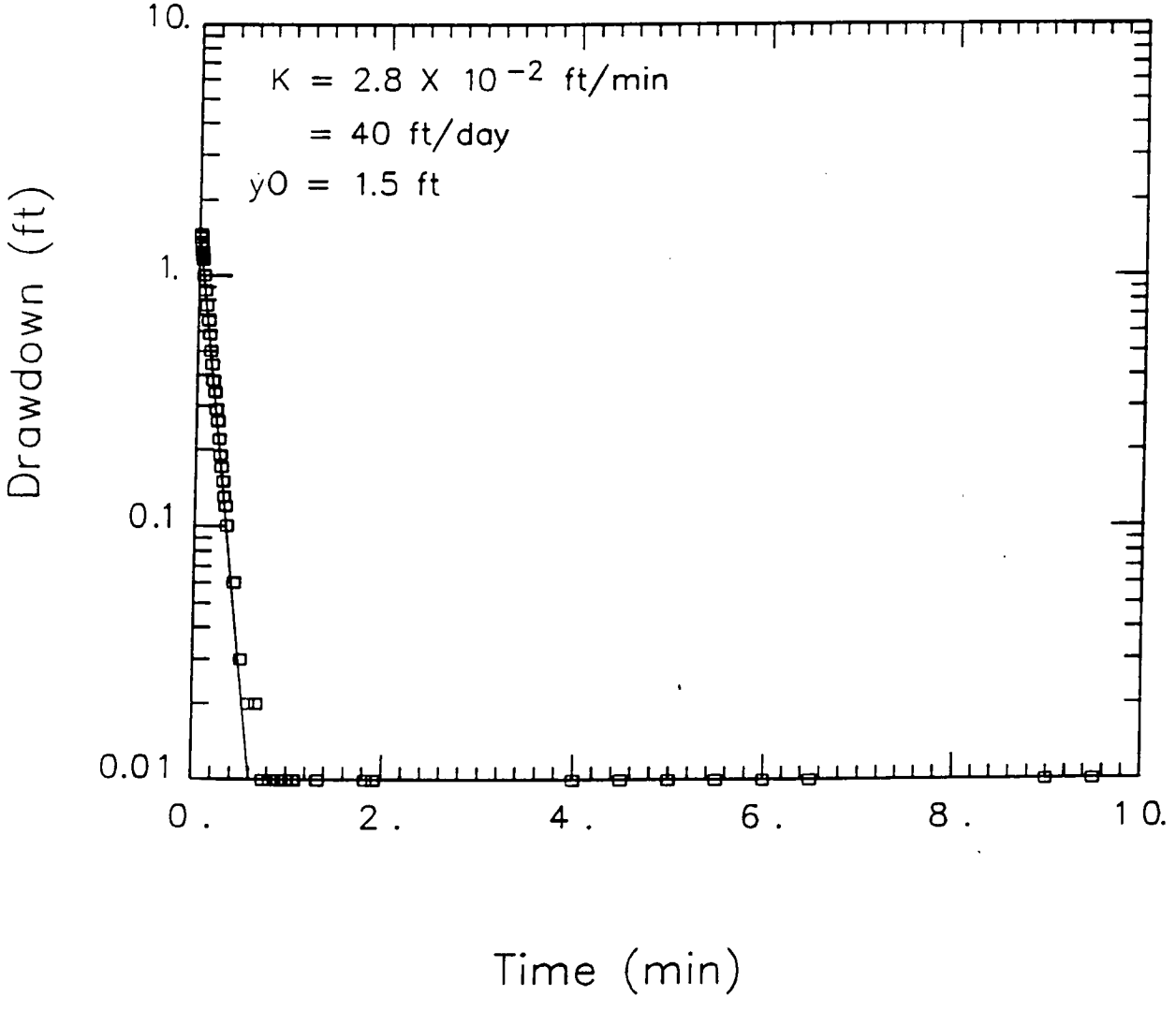
INPUT 1: Level (F)

Reference	8.43
Scale factor	10.01
Offset	0.00

Step# 0 02/28 13:50

Elapsed Time	Value
0.0000	6.37
0.0033	6.36
0.0066	6.42
0.0099	6.55
0.0133	6.59
0.0166	6.65
0.0200	6.72
0.0233	6.78
0.0266	6.84
0.0300	6.91
0.0333	6.97
0.0500	7.24
0.0666	7.47
0.0833	7.61
0.1000	7.69
0.1166	7.73
0.1333	7.76
0.1500	7.78
0.1666	7.80
0.1833	7.82
0.2000	7.83
0.2166	7.84
0.2333	7.85
0.2500	7.86
0.2666	7.87
0.2833	7.88
0.3000	7.89
0.3166	7.89
0.3333	7.90
0.4167	7.93
0.5000	7.96
0.5833	7.98
0.6667	8.00
0.7500	8.02
0.8333	8.04
0.9167	8.05
1.0000	8.07
1.0833	8.08
1.1667	8.09
1.2500	8.10
1.3333	8.11
1.4166	8.13
1.5000	8.13
1.5833	8.14
1.6667	8.15
1.7500	8.16
1.8333	8.17
1.9167	8.18
2.0000	8.19
2.5000	8.24
3.0000	8.27
3.5000	8.30
4.0000	8.31
4.5000	8.33
5.0000	8.34
5.5000	8.36
6.0000	8.36
6.5000	8.37
7.0000	8.37
7.5000	8.38
8.0000	8.38
8.5000	8.39
9.0000	8.40
9.5000	8.40
10.0000	8.41
12.0000	8.41
14.0000	8.42
16.0000	8.41
18.0000	8.41
20.0000	8.40
22.0000	8.40
24.0000	8.40
26.0000	8.41
28.0000	8.40
30.0000	8.41
32.0000	8.40
34.0000	8.39

Slug Extraction Well 13-MW-13



SE1000B
Environmental Logger
03/06 11:29

Unit# 01027 Test# 0

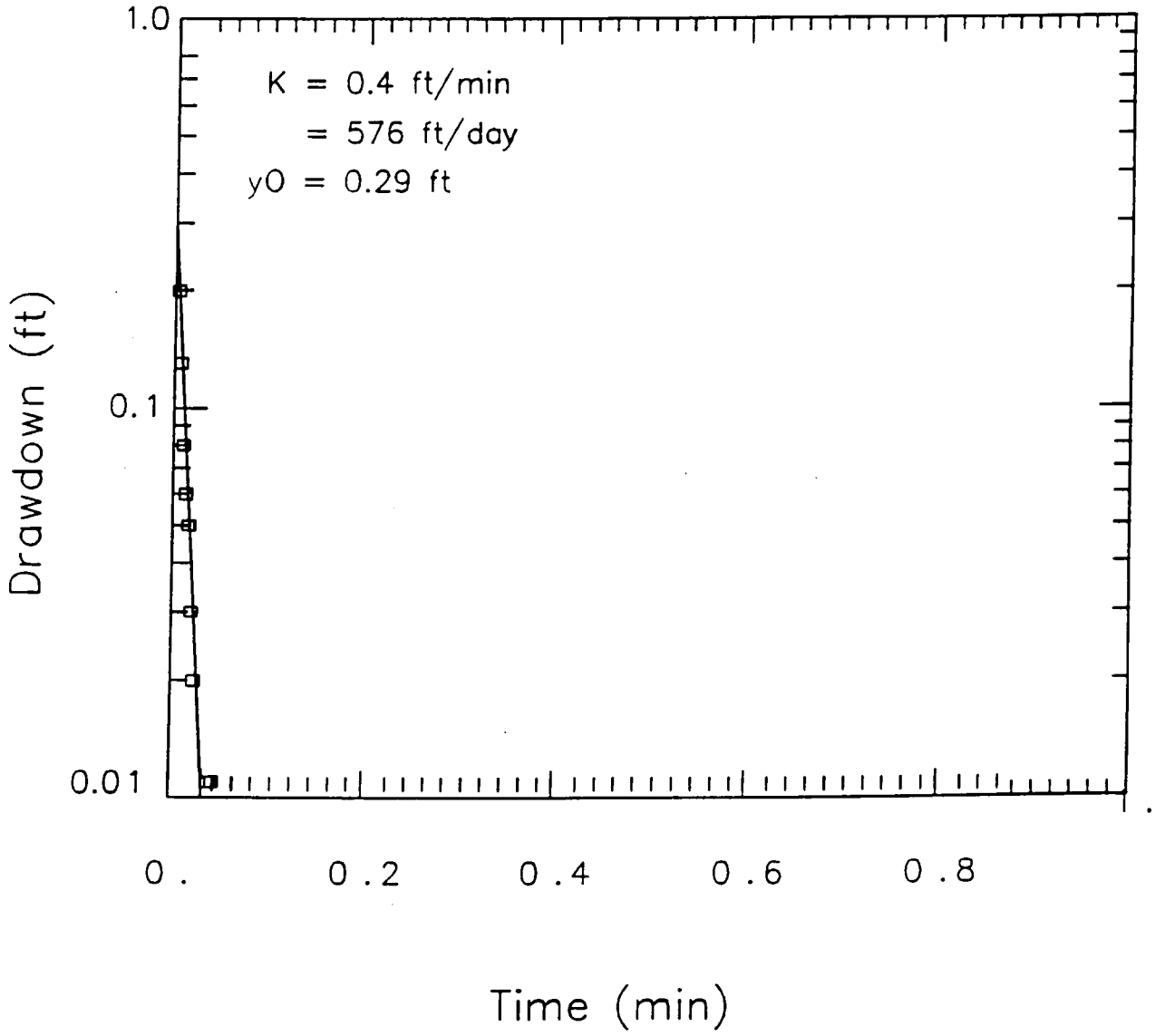
INPUT 1: Level (F)

Reference	7.97
Scale factor	10.01
Offset	0.00

Step# 0 03/04 09:38

Elapsed Time	Value
0.0000	6.42
0.0033	6.53
0.0066	6.51
0.0099	6.55
0.0133	6.61
0.0166	6.64
0.0200	6.68
0.0233	6.72
0.0266	6.75
0.0300	6.78
0.0333	6.82
0.0500	6.97
0.0666	7.10
0.0833	7.21
0.1000	7.31
0.1166	7.39
0.1333	7.47
0.1500	7.53
0.1666	7.59
0.1833	7.63
0.2000	7.68
0.2166	7.71
0.2333	7.75
0.2500	7.78
0.2666	7.80
0.2833	7.82
0.3000	7.84
0.3166	7.85
0.3333	7.87
0.4167	7.91
0.5000	7.94
0.5833	7.95
0.6667	7.95
0.7500	7.96
0.8333	7.96
0.9167	7.96
1.0000	7.96
1.0833	7.96
1.1667	7.97
1.2500	7.97
1.3333	7.96
1.4166	7.97
1.5000	7.97
1.5833	7.97
1.6667	7.97
1.7500	7.97
1.8333	7.96
1.9167	7.96
2.0000	7.97
2.5000	7.97
3.0000	7.97
3.5000	7.97
4.0000	7.96
4.5000	7.96
5.0000	7.96
5.5000	7.96
6.0000	7.96
6.5000	7.96
7.0000	7.97
7.5000	7.97
8.0000	7.97
8.5000	7.97
9.0000	7.96
9.5000	7.96
10.0000	7.97

Slug Extraction Well 13-MW-14



SE1000B
Environmental Logger
03/06 11:31

Unit# 01027 Test# 1

INPUT 1: Level (F)

Reference	10.05
Scale factor	10.01
Offset	0.00

Step# 0 03/04 10:27

Elapsed Time	Value
0.0000	9.75
0.0033	9.85
0.0066	9.92
0.0099	9.97
0.0133	9.99
0.0166	10.00
0.0200	10.02
0.0233	10.03
0.0266	10.04
0.0300	10.04
0.0333	10.05
0.0500	10.05
0.0666	10.05
0.0833	10.06
0.1000	10.06
0.1166	10.06
0.1333	10.06
0.1500	10.06
0.1666	10.07
0.1833	10.07
0.2000	10.06
0.2166	10.07
0.2333	10.07
0.2500	10.07
0.2666	10.07
0.2833	10.07
0.3000	10.07
0.3166	10.07
0.3333	10.07
0.4167	10.07
0.5000	10.07
0.5833	10.07
0.6667	10.07
0.7500	10.07
0.8333	10.08
0.9167	10.08
1.0000	10.08
1.0833	10.08
1.1667	10.08
1.2500	10.08
1.3333	10.08
1.4166	10.08
1.5000	10.08
1.5833	10.08
1.6667	10.08
1.7500	10.09
1.8333	10.09
1.9167	10.09
2.0000	10.09
2.5000	10.09
3.0000	10.09
3.5000	10.10
4.0000	10.10
4.5000	10.10
5.0000	10.10
5.5000	10.10
6.0000	10.10
6.5000	10.10
7.0000	10.10
7.5000	10.10
8.0000	10.10
8.5000	10.10
9.0000	10.10
9.5000	10.11
10.0000	10.11

APPENDIX C

QUALITY ASSURANCE/QUALITY CONTROL REPORT

AND

DATA REVIEW CHECKLIST

QUALITY ASSURANCE/QUALITY CONTROL REPORT

APPENDIX C

1.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) REPORT

This report provides a summary of the QA/QC procedures carried out as part of this project.

This project was conducted in accordance with the approved Quality Assurance/Quality Control and Data Management Plan and Field Sampling Plan dated April 1989. The QA/QC plan was developed based on guidance provided in *Sample and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program,* NEESA 20.2-047B. The program implemented at the Subase was performed under NEESA Level C Guidelines. This is equivalent to Data Quality Objective (DQO) Level 3 as defined by the USEPA. The major differences between Navy Level C and Navy Level D (DQO Level 4) occur in the analytical procedures used and validation of data. Level C allows for the use of EPA-approved analytical methods, whereas Level D requires the use of CLP procedures only. However, CLP analytical procedures were used for this project. Level C involves data review as described in Section 1.3 of this appendix, in contrast to the CLP validation required for Level D.

This report provides a discussion of field QC samples, field audits, data validation and data quality objectives.

1.1 Field Quality Control (QC) Samples

The QA/QC plan called for the collection of field duplicates, referee duplicates, trip blanks, field blanks, and equipment rinsates. Matrix spike and matrix spike duplicates were also analyzed as a part of laboratory QA/QC. Quality control samples specified frequencies to be collected, and actual sample quantity collected as part of this project are summarized in Table C-1.

The referee duplicates were collected by Alliance Technologies, an EPA oversight contractor. To date, final results of the referee duplicate analyses have not been received; however, the USEPA has indicated that preliminary results indicate the precision of the analytical results is acceptable. The trip blanks which contained deionized laboratory water originate at the laboratory, stay with the samples, and are sent back to the laboratory. The equipment rinsates consisted of distilled water utilized as a final rinse during equipment decontamination procedures. The field blanks were samples of driller's water, and water used for equipment decontamination.

A small number of trip blanks contained low levels of volatile organics, but neither trip nor field blanks demonstrated any significant problems. Equipment rinsates were found to contain elevated levels of metals in the beginning of the sampling program. It was determined that the use of ten percent (10%) nitric acid solution as a decon fluid on the driller's split spoons may have been causing leaching of metals into the rinsates. This procedure was modified to use 1% nitric acid solution and the levels of metals in the rinsates did diminish. The equipment rinsates caused the estimation of some inorganic data, as is discussed in Section 1.3.2.

Matrix spikes and matrix spike duplicates were run for volatiles, semi-volatiles, and pesticides/PCBs at a frequency of 1 in 20 samples of similar matrix or one per batch of samples sent

TABLE C-1
SUMMARY OF QA/QC SAMPLES

SAMPLE TYPE	SPECIFIED FREQUENCY	SPECIFIED SAMPLE QUANTITY	ACTUAL SAMPLE QUANTITY
Field Duplicates	10% per matrix	32	36
Referee Duplicates	As determined by USEPA	---	10
Equipment Rinsates	Collect one per day, analyze every other day. Analyze remaining samples if pertinent analytes are found in the rinsates.	73	73
Trip Blanks	One per cooler containing VOC samples.	47	47
Field Blanks	One per source of decon and drilling water.	3	4

1. Matrix spikes and matrix spike duplicates were performed at a frequency of 5% per matrix for organic analyses.
2. Matrix spikes and duplicates were performed at a frequency of 5% per matrix for inorganic analyses.

to the laboratory, whichever was greater. For metals analysis, a duplicate and a matrix spike were run for every 20 samples of similar matrix, or one per batch of samples. Matrix spike recoveries were generally acceptable although small amounts of data were estimated or rejected based on poor matrix spike recoveries. See Section 1.3 for further discussion.

1.2 Field Audits

Several audits were performed by Atlantic's QA coordinator to ensure that the field work was conducted according to the procedures contained in the Field Sampling Plan. Field audits and/or inspections were performed on the following days:

DATE	TYPE OF SAMPLING OBSERVED
August 30, 1990	Subsurface Soils
November 13, 1990	Subsurface Soils
January 15, 1991	Ground Water

The field audits indicated general compliance with the required sampling procedures; several minor deviations of the procedures were noted and corrected.

USEPA oversight was provided by Alliance Technologies, Inc.

1.3 Data Validation

A checklist (included as an attachment to this appendix) was developed to facilitate the review of analytical data generated under Navy Level C requirements (DQO Level 4). The checklist incorporated the provisions for validation presented in the NEESA document entitled *Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program,* NEESA 20.2-047B. The criteria presented in the checklist to evaluate sample and quality control results are based on the analytical requirements and validation guidelines defined in NEESA 20.2-047B.

Data validation involved the checking of laboratory-generated forms for sample quality control, standards results, and assignment of the data qualifiers if appropriate.

The checklist provides summary pages for listing estimated and rejected data results upon completion of the validation process. The resulting data qualifiers were transcribed onto the laboratory data result forms and subsequently added to any data tables generated. A summary of the data qualifiers are provided on Table C-2.

It is important to note that there are a variety of reasons for estimating or rejecting data. Reasons for qualification of data are discussed in further detail in the subsequent sections. The completed data review checklists provide validation information pertaining to any specific samples.

A summary of data qualification is presented in Table C-3. These qualifications are discussed in more detail below.

1.3.1 Estimation of Laboratory Data (Organics)

The highest percentage of organic data estimation was based upon review of holding times.

TABLE C-2
LABORATORY ANALYTICAL DATA QUALIFIERS

Organic Data Qualifier Flags	
ND	None detected.
J	The "J" flag indicates an estimated value due to validation requirements or when the data indicates the presence of a compound that meets identification criteria, but the quantitated value is less than the CRQL.
B	The "B" flag indicates that the analyte was found in the associated blank as well as in the sample.
D	The "D" flag indicates that the sample was diluted due to high concentrations.
E	The "E" flag indicates compound concentrations that exceed the calibration range of the GC/MS instrument.
X or Y	The "X" or "Y" flag indicates that the compound values have been edited on a laboratory data system.
R	The "R" flag indicates that the result is rejected based on validation guidelines.
Inorganic Data Qualifier Flags	
ND	None detected.
J	The "J" flag indicates an estimated value due to laboratory or data validation requirements.
B	The "B" flag indicates that the reported value is less than the CRDL, but greater than the IDL (Instrument Detection Limit).
R	The "R" flag indicates that the result is rejected based on validation guidelines.

TABLE C-3
SUMMARY OF VALIDATION QUALIFICATIONS

ORGANIC DATA REASONS FOR QUALIFICATION								
Holding Times	**Matrix Spike**	**Duplicate**	**Surrogate**	**Calibration Standard**	**Internal Standard**	**DDT or Endrin Breakdown**	**Blank Results**	**No Pest/PCB Confirmation**
Number of Results Estimated								
2762	13	264	374	20	567	5		
Number of Results Rejected								
157	6		181			1		5
Number of Results Changed								
							480	

$$\%\ organic\ data\ estimated = \frac{4005}{28852} x100 = 13.9\%$$

$$\%\ organic\ data\ rejected = \frac{350}{28852} x100 = 1.2\%$$

$$\%\ organic\ data\ changed = \frac{480}{28852} x100 = 1.7\%$$

INORGANIC DATA REASONS FOR QUALIFICATION				
Blank Results	**Matrix Spike**	**Duplicate**	**Laboratory Control Sample**	**MSA[1] Correlation**
Number of Results Estimated				
1556	765	397	21	13
Nunber of Results Rejected				
	173		8	

Notes:

1 MSA indicates Method of Standard Addition

$$\%\ inorganic\ data\ estimated = \frac{2752}{8004} x100 = 34.4\%$$

$$\%\ inorganic\ data\ rejected = \frac{181}{8004} x100 = 2.3\%$$

$$\%\ total\ data\ estimated = \frac{6757}{36856} x100 = 18.3\%$$

$$\%\ total\ data\ rejected = \frac{531}{36856} x100 = 1.4\%$$

Other reasons for estimating relatively small amounts of organic data included the following:

- poor duplicate reproducibility;
- matrix spike recoveries exceeding limits;
- surrogate recoveries exceeding limits;
- internal standards exceeding limits;
- pesticides calibration check compounds and continuing calibration check compounds outside of limits; and
- pesticides DDT and endrin allowable percent breakdown exceeded.

Several groups of samples were resampled due to grossly exceeded holding times. One batch of pesticide samples was estimated rather than rejected based on exceeding holding times. These samples included: 2WTB6(0-2), 2WTB6(4-6), 2WTB4(0-2), 2WTB1(8-10), 2WTB1 (10-12), 2WTB1(15-17), and 2WTB1(20-22). These were extracted within holding time but were analyzed eight to nine days outside holding time. Pesticides tend to exhibit stability once extracted into solvent. Since these samples were extracted within holding times, it was decided to estimate the data results rather than reject them. Data from other samples in the vicinity was evaluated before making this decision, and the results compared favorably.

1.3.2 Estimation of Laboratory Data (Inorganics)

The two main causes of estimated inorganic data were the presence of analytes in method and equipment blanks, and matrix spike recoveries outside of acceptable limits. These two factors accounted for the estimation of a significant amount of inorganic data. A small amount of inorganic data was also estimated based on poor laboratory and field duplicate reproducibility, unacceptable laboratory control samples, and poor Method of Standard Addition (MSA) correlation.

1.3.3 Rejection of Laboratory Data (Organics)

Very few samples were rejected for organic parameters. One sample, 15TB3(4-8) pesticides, was rejected due to holding times being grossly exceeded. Two samples, 8MW2(10-12) and 8TB3 (10-12), had positive pesticides rejected due to the lack of confirmatory runs. A few analytes were rejected due to the following problems:

- matrix spike recoveries < 10%;
- surrogate recoveries < 10%; and
- pesticides DDT and endrin exceeding allowable percent breakdown.

1.3.4 Rejection of Laboratory Data (Inorganics)

A small amount of none detected inorganic results were rejected as a result of matrix spike recoveries < 30%. A small number of samples were rejected due to poor laboratory control sample results.

Due to the large number of samples analyzed in this investigation, the preceding sections discussing estimation and rejection of data are of a general scope. Only major sources of data

qualification and notable individual samples were discussed. The reasons for qualifying all individual samples are noted on the completed data review checklists.

1.3.5 Changing of Laboratory Data (Organics)

Nearly two percent of organic data was changed based upon results of method blanks, equipment rinsates, and trip blanks. The finding of organics in any of these blanks affects the sample results by allowing the reviewer to raise the detection limits of these analytes in associated samples (see Section B.7 of the Data Review Checklist).

1.4 Data Quality Objectives

Data validation was used to evaluate whether the data quality objectives (DQO) for all measurements (field and laboratory) had been reached. The DQOs include considerations of precision, accuracy, and completeness as summarized in the following paragraphs.

Precision is a test of the repeatability of a measurement. Precision is evaluated directly by recording and comparing multiple measurements of the same parameter on the same sample under the same conditions. These samples can take the form of laboratory or field duplicates. Precision is considered acceptable if the relative percent difference (RPD) between two samples is within $\pm$ 20 percent. The RPD is calculated as:

$$RPD = \frac{V1 - V2}{\left(\frac{V1 + V2}{2}\right)} x100$$

Where $V_1 V_2$ = two values obtained by analyzing duplicates.

Duplicate analysis results were scrutinized as part of the data validation process. RPDs were calculated by the laboratory and as part of data validation. Approximately two percent of the analytical results were estimated due to duplicates having RPDs greater than 20 percent.

Accuracy of analysis was determined by the evaluation of matrix spike samples of known quantities. The degree of accuracy and recovery of an analyte expected for the analysis of QA samples and spiked samples is dependent upon the matrix, method of analysis, and compound or element being determined in the analysis. Unless otherwise specified, the QC objective for accuracy is a percent recovery of 75 to 125 percent.

Accuracy calculations, prepared by the laboratory, are provided in the laboratory analytical package. Analytes exhibiting values lower or higher than this were estimated in associated samples. Samples for inorganic analysis which were not detected and had associated spike recoveries $<30\%$ were rejected as part of data validation. Samples for organic analysis which were none detected and had spike recoveries $<10\%$ were rejected as part of data validation.

Completeness is a measure of the amount of valid data obtained relative to the total amount of data generated. This project's QC objective for completeness, as a percentage of valid data reported, was $\geq$90%. The actual completeness was calculated as follows:

$$C=100\frac{V}{T}$$

where: C = percent completeness
V = number of judgements deemed valid
T = total number of analytes measured

$$C=100x\frac{36325}{36856}=98.6\%$$

Thus the completeness, or percentage of results determined valid, equaled 98.6%.

Based upon the performance of both field and laboratory QC samples, the data quality objectives for this project were met or exceeded. The data validation process was adequate to determine any significant problems with the data generated. Precision, accuracy and completeness were all acceptable.

DATA REVIEW CHECKLIST

PART A: DATA SUMMARY

Case Nos.: _____ Laboratory: _____

Site: _____ Reference: _____

ORGANICS:

Date: _____ Reviewer: _____

Aqueous Samples: _____

_____

Soil/Sediment Samples: _____

_____

QC Samples: _____

_____

INORGANICS:

Date: _____ Reviewer: _____

Aqueous Samples: _____

_____

Soil/Sediment Samples: _____

_____

QC Samples: _____

_____

A.1.0 Data Review Checklist	YES	NO	N/A
A.1.1 Does the package contain any Volatiles (VOA) data?	___	___	___
A.1.2 Does the package contain any Semivolatiles (ABN) data?	___	___	___
A.1.3 Does the package contain any Pesticides/PCB (PEST) data?	___	___	___
A.1.4 Does the package contain any Metals/Inorganic data?	___	___	___
A.1.5 Does the package contain any non-TCL data?	___	___	___

A.2.0 Acceptability of Data

A.2.1 Are all VOA data results acceptable as reported?	[___]	___	___
If no, list exceptions in A.3.0 and A.4.0.			
A.2.2 Are all ABN data results acceptable as reported?	[___]	___	___
If no, list exceptions in A.3.0 and A.4.0.			
A.2.3 Are all PEST data results acceptable as reported?	[___]	___	___
If no, list exceptions in A.3.0 and A.4.0.			
A.2.4 Are all Metals/Inorganic data acceptable as reported?	[___]	___	___
If no, list exceptions in A.3.0 and A.4.0.			
A.2.5 Are all non-TCL data results acceptable as reported?	[___]	___	___
If no, list exceptions in A.3.0 and A.4.0.			

A.3.0 Estimated Data Results

List estimated data results:

Sample	Fraction	Analyte	Value	Reason

A.4.0 Rejected Data Results

List rejected data results:

Sample	Fraction	Analyte	Value	Reason

PART B: ORGANIC DATA REVIEW

B.1.0 Data Completeness and Deliverables	YES	NO	N/A[1]
B.1.1 Is the Case Narrative present?	[___][2]	___	___
B.1.2 Is the Chain of Custody present?	[___]	___	___
B.1.3 Are any NEESA deliverables missing from the data package?	___	[___]	___

RECOMMENDED ACTION: Call laboratory project manager for explanation/resubmittal of any missing deliverables.

B.1.4 Were the missing deliverables received?	[___]	___	___

B.2.0 Case Narrative

B.2.1 Does the Case Narrative indicate any problems with any of the analyses?	___	[___]	___

List noted problems here:

_____

_____

B.3.0 Holding Times

B.3.1 Review COC for sampling date, and review Forms I for date of analysis. Were any VOA, ABN, or PEST samples analyzed outside of holding times?	___	[___]	___

1) Not Applicable
2) Bracketed column is desired response. Deviation from bracketed response requires following Recommended Action.

B.3.1 Continued . . .

RECOMMENDED ACTION: If any sample is extracted or analyzed outside of holding times, estimate all positive detects in the associated samples. If holding times are grossly exceeded, the reviewer may choose to reject non-detected results.

List samples (fraction) analyzed outside of holding times, and action taken:

_____

_____

B.3.2 Review Forms I for dates of extraction. Were any ABN or PEST samples extracted outside of holding times? ___ [___] ___

List samples (fraction) extracted outside of holding times, and action taken:

_____

_____

B.3.3 If any samples were reanalyzed outside of holding times, are both the original and the reanalyzed runs reported? [___] ___ ___

B.3.4 Review COC for shipping date. Were samples shipped within 24 hours of collection? [___] ___ ___

B.4.0 <u>Surrogate Recoveries</u>

B.4.1 Review Forms II. Are any surrogate recoveries for any VOA or PEST samples or blanks outside of QC limits? ___ [___] ___

If yes, were samples reanalyzed? [___] ___ ___

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

B.4.1 Continued . . .

Reanalysis okay? [___] ___ ___

RECOMMENDED ACTION: For VOA samples estimate positive results within that region of the chromatogram in the associated samples. (No action for PEST samples).

List associated samples (compounds) and action taken:

_____

_____

_____

B.4.2 Are any surrogate recoveries in any ABN blank outside of QC limits? ___ [___] ___

If yes, was blank reanalyzed? [___] ___ ___

Reanalysis okay? [___] ___ ___

RECOMMENDED ACTION: Estimate all positive results in all associated samples.

List associated samples (compounds) and action taken:

_____

_____

_____

B.4.3 Are any two surrogates in either the acid or the base/neutral fraction of any ABN sample outside of QC limits? ___ [___] ___

If yes, were samples reanalyzed? [___] ___ ___

Reanalysis okay? [___] ___ ___

RECOMMENDED ACTION: Estimate positive results within that region of the chromatogram in associated samples.

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

B.4.3 Continued . . .

List associated samples (compounds) and action taken:

_____

_____

_____

B.4.4 Are any surrogates in any sample recovered at less than 10%? ___ [___] ___

If yes, were samples reanalyzed? [___] ___ ___

Reanalysis okay? [___] ___ ___

RECOMMENDED ACTION: Estimate positive results and reject non-detected results within that region of the chromatogram in associated samples.

List associated samples (compounds) and action taken:

_____

_____

_____

B.5.0 Matrix Spike/Matrix Spike Duplicates

B.5.1 Were matrix spikes analyzed at the required frequency for each of the following matrices?

Low Water [___] ___ ___

Low Soil [___] ___ ___

Medium Soil [___] ___ ___

List missing MS/MSD (fraction, matrix, concentration):

_____

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

B.5.2 How many VOA spike recoveries are outside QC limits?

Water	Low Soil	Medium Soil	N/A
___ out of 10	___ out of 10	___ out of 10	___

B.5.3 How many VOA RPDs are outside QC limits?

Water	Low Soil	Medium Soil	N/A
___ out of 5	___ out of 5	___ out of 5	___

RECOMMENDED ACTION: If recovery is >10%, then estimate positive results for that compound in the unspiked sample. If the recovery is <10%, then estimate positive results or reject negative results for that compound in the unspiked sample.

List affected samples (compound) and action taken:

_____

_____

B.5.4 How many ABN spike recoveries are outside QC limits?

Water	Low Soil	Medium Soil	N/A
___ out of 22	___ out of 22	___ out of 22	___

B.5.5 How many ABN RPDs are outside QC limits?

Water	Low Soil	Medium Soil	N/A
___ out of 11	___ out of 11	___ out of 11	___

List affected samples (compounds) and action taken:

_____

_____

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

B.5.6 How many PEST spike recoveries are outside QC limits?

Water	Low Soil	Medium Soil	N/A
___ out of 12	___ out of 12	___ out of 12	___

B.5.7 How many PEST RPDs are outside QC limits?

Water	Low Soil	Medium Soil	N/A
___ out of 6	___ out of 6	___ out of 6	___

List affected samples (compound) and action taken:

_____

_____

B.5.8 If any VOA, ABN, or PEST spike percent recoveries or RPDs are outside QC limits, refer to questions B.4.1 and B.4.2. Are any of the surrogate percent recoveries for the spike/blank associated with the MS/MSD pair also outside of QC limits? ___ [___] ___

RECOMMENDED ACTION: If both the MS/MSD pair and the associated method spike/blank are outside QC limits, th n estimate positive results and reject non-detected results for all compounds in all samples associated with that spike/blank.

If yes, list associated samples and action taken:

_____

_____

B.5.9 Was the sample that was analyzed as an MS/MSD also analyzed as a field duplicate? [___] ___ ___

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

B.5.10 If no, compare the results for the non-spiked compounds in the MS/MSD/sample set, and calculate RSDs. Are any water RSDs > 30%, or any soil RSDs > 50%? ___ [___] ___

RECOMMENDED ACTION: If any RSD is > 30% for waters or > 50% for soils, estimate positive results for that compound in the affected samples.

If yes, list affected compounds (samples) and action taken:

_____

_____

B.6.0 Field Duplicate Samples

B.6.1 Were field duplicate samples collected and analyzed at the required frequency? [___] ___ ___

B.6.2 Compare the field duplicate sample results as well as the MS/MSD/sample unspiked compound results. Calculate the RPD or RSD for each compound. Was any RPD or RSD > 30% for aqueous samples or > 50% for soil samples? ___ [___] ___

RECOMMENDED ACTION: If any RPD or RSD is > 30% for aqueous samples or > 50% for soil samples, estimate positive results for that compound in all the samples used to calculate the RPD or RSD.

If yes, list the compound (RPD or RSD), and action taken:

_____

_____

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions ar not absolute: care and professional judgement should be used when qualifying data.

B.7.0 Method Blank/Spike Samples

B.7.1 For each day and each instrument of VOA sample analysis, has a method blank/spike sample been analyzed for each sample matrix and concentration analyzed? [___] ___ ___

If no, list missing method blank/spike samples (dat , instrument, matrix, level):

B.7.2 For each extraction date and each instrument of ABN and PEST analysis, has a method blank/spike sample been analyzed for each sample matrix and concentration analyzed? [___] ___ ___

If no, list missing method blank/spike samples (fraction, extraction date, instrument, matrix, level):

B.7.3 In addition to the method blank/spike sample, was a PEST blank/spike sample, spiked with at least one PEST or PCB compound besides dibutylchlorendate, analyzed? [___] ___ ___

If no, list associated samples:

B.7.4 Review Forms IV. Are all analyzed samples listed? [___] ___ ___

B.7.5 Were any of the following compounds detected in any VOA or ABN method blank/ spike samples?

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

B.7.5 Continued . . .

a. Methylene chloride	___	[___]	___
b. Acetone	___	[___]	___
c. 2-Butanone	___	[___]	___
d. Toluene	___	[___]	___
e. Phthalate esters	___	[___]	___

If yes, multiply 10x the highest blank concentration found for each compound to determine "action level."

B.7.6 Were any of the remaining TCL compounds detected in any VOA, ABN or PEST method blank/spike sample? ___ [___] ___

If yes, multiple 5x the highest blank concentration found for each compound to determine the "action level."

RECOMMENDED ACTION: Review Forms IV to determine associated samples. Review Forms I for affected samples. If associated sample concentration is < CRQL and < action level, report value as the CRQL (non-detect). If the associated sample concentration is > CRQL but < action, level, elevate detection limit to sample concentration and report as non-detect.

List associated samples (compound) and action taken:

_____

_____

B.7.7 Were trip, field, and equipment blanks analyzed at the required frequency? [___] ___ ___

If no, list missing blanks (type, date):

_____

B.7.8 Were any contaminants detected in any of the equipment blanks analyzed? ___ [___] ___

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

B.7.8 Continued . . .

If yes, were the remaining equipment blanks additionally analyzed? [___] ___ ___

B.7.9 Were any of the following compounds detected in any VOA or ABN trip, field or equipment blanks?

a. Methylene chloride	___	[___]	___
b. Acetone	___	[___]	___
c. 2-Butanone	___	[___]	___
d. Toluene	___	[___]	___
e. Phthalate esters	___	[___]	___

If yes, multiply 10x the highest blank concentration found for each compound to determine "action level."

B.7.10 Were any of the remaining TCL compounds detected in any VOA, ABN or PEST trip, field or equipment blank? ___ [___] ___

If yes, multiple 5x the highest blank concentration found for each compound to determine the "action level."

RECOMMENDED ACTION: Same as above, except qualifications are limited to the samples shipped with the trip blank and/or the samples taken the same day as the equipment/ field blank.

List associated samples (compound) and action taken:

_____

_____

B.8.0 GC/MS Tuning

B.8.1 Review Forms V. Was a GC/MS tune performed every twelve hours on each VOA and ABN instrument? [___] ___ ___

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

B.8.2 Were the ion abundance criteria met for each GC/MS tune performed? [___] ___ ___

If no, list tune (fraction, date, time, instrument, matrix) and associated samples:

B.8.3 Were all samples run within twelve hours of an acceptable GC/MS tune? [___] ___ ___

If no, list affected samples and action taken:

B.9.0 Initial Calibration of the GC/MS System

B.9.1 Review Forms VI. Are the %RSDs $\leq$ 30% for all CCC compounds for all VOA and ABN initial calibration curves? [___] ___ ___

RECOMMENDED ACTION: Estimate positive results for that compound in associated samples. If %RSD > 50%, estimate non-detected results as well in associated samples.

List associated samples (compounds) and action taken:

B.9.2 Are the RRFs $\geq$ 0.300 for all VOA SPCC compounds (except bromoform $\geq$ 0.250)? [___] ___ ___

RECOMMENDED ACTION: Estimate positive results for that compound in associated samples.

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

B.9.2 Continued . . .

List associated samples (compounds) and action taken:

_____

_____

_____

B.9.3 Are the RRFs $\geq$ 0.050 for all ABN SPCC compounds? [___] ___ ___

RECOMMENDED ACTION: Estimate positive results for that compound, and reject non-detected results for that compound in associated samples.

List associated samples (compounds) and action taken:

_____

_____

_____

B.10.0 Continuing Calibration of the GC/MS System

B.10.1 Review Forms VI. Are the %Ds $\leq$ 25% for all VOA and ABN CCC compounds? [___] ___ ___

RECOMMENDED ACTION: Estimate positive results for that compound in associated samples. If %D > 50%, then estimate non-detected results as well in associated samples.

List associated samples (compounds) and action taken:

_____

_____

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

B.10.2 Are the RRFs ≥ 0.300 for all VOA SPCC compounds (except bromoform ≥ 0.250)? [___] ___ ___

RECOMMENDED ACTION: Estimate positive results for that compound in associated samples.

List associated samples (compounds) and action taken:

_____

_____

_____

B.10.3 Are the RRFs ≥ 0.050 for all ABN SPCC compounds? [___] ___ ___

RECOMMENDED ACTION: Estimate positive results, and reject negative results for that compound in associated samples.

List associated samples (compounds) and action taken:

_____

_____

_____

B.11.0 Internal Standard Performance

B.11.1 Review Forms VIII. Are the internal standard areas for all VOA and ABN analyses within -50 to +100% of the associated continuing calibration standard? [___] ___ ___

If no, list affected samples (I.S.) and action taken:

_____

_____

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: car and professional judgement should be used wh n qualifying data.

B.12.0 Pesticide Instrument Calibration

B.12.1 Review Forms VIII. Are the initial calibration linearity check compound %RSDs ≤ 10% for the quantitation column? [___] ___ ___

If no, list compounds (%RSD):

RECOMMENDED ACTION: If linearity criterion for DDT is not met, then an additional three point calibration curve is required for the quantitation of DDT, DDE, and DDD.

Was the additional three point calibration curve for DDT analyzed? [___] ___ ___

RECOMMENDED ACTION: If initial linearity criteria ar not met, then estimate positive results for that compound in associated samples.

List associated samples and action taken:

B.12.2 Review Forms VIII. Was the proper 72-hour analytical sequence followed? [___] ___ ___

If no, note discrepancies and action taken:

B.12.3 Review Forms IX. Are the continuing calibration factor %Ds ≤ 15% for the quantitation column, and ≤ 20% for the confirmation column for all compounds? [___] ___ ___

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used wh n qualifying data.

B.12.3 Continued . . .

RECOMMENDED ACTION: Estimate positive results for that compound in the associated samples.

List associated compounds (samples) and action taken:

_____

_____

B.13.0 Pesticide Instrument Performance

B.13.1 Review Forms IX. Are the DDT RTs ≥ 12 minutes for all packed column analyses? [___] ___ ___

If no, list affected samples and action taken:

_____

B.13.2 Review Forms IX. Are all continuing calibration standard compounds within the defined RT windows? [___] ___ ___

List affected samples (compounds) and action taken:

_____

_____

B.13.3 Review Forms VIII. Are the % Breakdowns for either DDT or endrin or the combined % Breakdown > 20%? ___ [___] ___

RECOMMENDED ACTION: DDT - estimate positive results for DDT in associated samples. If DDT was not detected, but DDD and DDE are positive, then reject the detection limit for DDT. Endrin - estimate positive results for endrin in associated samples. If endrin was not detected, but endrin aldehyde and endrin ketone are positive, th n reject the detection limit for endrin.

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

B.13.3 Continued . . .

List associated samples (compounds) and action taken:

_____

_____

B.13.4 Review Forms VIII. Are the DBC RT %Ds < 2.0% for all packed column analyses? [___] ___ ___

If no, list affected samples (%D) and action taken:

_____

_____

B.14.0 Pesticide Compound Identification

B.14.1 Review Forms I and X. Are positive identifications confirmed by analysis on a secondary column? [___] ___ ___

RECOMMENDED ACTION: If confirmation of positive detects was not performed, reject results.

List affected samples (compound) and action taken:

_____

_____

B.14.2 Are the RTs for the compounds identified within the defined RT windows for both the primary and the confirmation column? [___] ___ ___

If no, list affected samples (compound, column) and action taken:

_____

_____

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judg ment should be used when qualifying data.

PART C: INORGANIC DATA REVIEW

C.1.0 Data Completeness and Deliverables	YES	NO	N/A
C.1.1 Is the Case Narrative present?	[___]	___	___
C.1.2 Is the Chain of Custody present?	[___]	___	___
C.1.3 Are any NEESA deliverables missing from the data package?	___	[___]	___

RECOMMENDED ACTION: Call the laboratory project manager for explanation/resubmittal of any missing deliverables.

C.1.4 Were the missing deliverables received?	[___]	___	___

C.2.0 Case Narrative

C.2.1 Does the Case Narrative indicate any problems with any of the analyses?	___	[___]	___

List noted problems here:

_____

_____

_____

C.3.0 Preservation and Holding Times

C.3.1 Review the COC for sampling date, and review the Forms 10 for analysis dates. Were any mercury (28 days), cyanide (14 days), or metals (6 months) samples analyzed outside of holding times?	___	[___]	___

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. Th se actions are not absolute: care and professional judg ment should be used when qualifying data.

RECOMMENDED ACTION: Estimate positive results for any samples which were analyzed outside of holding times.

List samples/analyte analyzed outside of holding times, and action taken:

C.4.0 Calibrations

C.4.1 Review Forms 2A. Were the ICV and CCV %R 90-110% for metals, 80-120% for mercury, and 85-115% for cyanide? [___] ___ ___

If no, list analytes (%R) and affected samples:

RECOMMENDED ACTIONS: If following any reanalysis, the ICV recovery for any metal is still outside of the 90-110 %R window, all sample results for that metal shall be rejected.

Estimate positive results for metals (75-89%, 111-125%), for mercury (65-79%, 121-135%), and for cyanide (70-84%, 116-130%). Estimate non-detected results for metals (75-89%), for mercury (65-79%), and for cyanide (70-84%). Reject all results for metals (<75%, >125%), for mercury (<65%, >135%), and for cyanide (<70%, >130%).

List any affected samples, analytes, and the recommended actions:

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. Th se actions are not absolute: care and professional judgement should b used when qualifying data.

C.5.0 Blanks

C.5.1 Was a preparation blank analyzed for each matrix, for every 20 samples, and for each digestion blank? [___] ___ ___

C.5.2 Review Forms 3. Were all elements less than the IDL? [___] ___ ___

If not, list the elements and the highest concentration of each found in any ICB, CCB or preparation blank.

_____

_____

C.5.3 Were any samples identified as field or equipment blanks? If so, review the Forms I for those samples and list the elements and the concentrations of each found in the field or equipment blanks. [___] ___ ___

_____

_____

List the action levels (10x highest concentration found in any calibration or preparation blank, and 5x highest concentration found in any field or equipment blank) for each element found in any blank.

_____

_____

RECOMMENDED ACTION: When the concentration of any analyte in a sample is greater than the IDL, but less than the Action Level, report the sample concentration with a J as estimated.

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

List the actions taken and the affected samples.

C.6.0 Interference Check Standard

C.6.1 Review Forms 4. Were all %R of elements in the ICS AB solution > 80 and < 120%? [___] ___ ___

List the concentrations of any elements detected in ICS A > 2xIDL which should not be present.

RECOMMENDED ACTIONS: Estimate all associated sample results for those elements which did not meet the %R criteria. Reject all sample results for those elements for which %R was <50%.

For those elements present in the ICS A, which should not be present, estimate positive and non-detected results when the level of interferents in the sample are greater than 50% of that in the ICS. Reject positive results which are due entirely to the interfering element.

List any actions taken and the affected samples based on the results of the ICS.

C.7.0 Matrix Spike

C.7.1 Was a matrix spike prepared at the required frequency? [___] ___ ___

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

C.7.2 Review Forms 5A. Were all spike recoveries greater than 75% and less than 125% for elements for which the sample concentration was less than 4x the spike added? [___] ___ ___

C.7.3 Was a post digestion spike analyzed for ICP elements that did not meet required criteria for spike recovery (Form 5B)? [___] ___ ___

RECOMMENDED ACTIONS: Estimate all associated sampl results for any analyte which does not meet the %R criteria. Reject all associated non-detects for any analyte for which the %R was less than 30%.

List the element, the percent recovery, and any actions taken based on the results of the spiked sample.

C.8.0 Laboratory Duplicates

C.8.1 Was a laboratory duplicate sample prepared at the required frequency? [___] ___ ___

C.8.2 Review Forms 6. Were all RPDs <20% for aqueous samples or <35% for soil samples (within ±2xCRDL for analytes whose concentration is less than 5x CRDL in the duplicate samples)? [___] ___ ___

RECOMMENDED ACTIONS: Estimate all associated positive sample results for any analyte whose RPD did not meet criteria.

List the element, the RPD, and any actions taken based on the results of the laboratory duplicates.

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guid lines. These actions are not absolute: care and professional judgement should be used when qualifying data.

C.9.0 Field Duplicates

C.9.1 Was a field duplicate pair identified? [___] ___ ___

C.9.2 If so, calculate the RPD for each element. Were all RPDs <30% for aqueous samples or <50% for soil samples (within 2xCRDL when results are less than 5xCRDL)? [___] ___ ___

RECOMMENDED ACTIONS: Estimate all associated positive sample results for any analyte whose RPD did not meet criteria.

List the element, the RPD, and any actions taken based on the results of the field blanks.

C.10.0 Laboratory Control Sample or Blank/Spike Sample

C.10.1 Was an LCS or method blank spike analyzed for every matrix and every digestion batch? [___] ___ ___

C.10.2 Was a control chart provided? [___] ___ ___

C.10.3 Review Forms 7. Were all LCS recoveries within the internal QC limits set by the laboratory? [___] ___ ___

C.10.4 Were samples reanalyzed when other QC problems were found with the data? [___] ___ ___

RECOMMENDED ACTIONS: Estimate all associated sample results for those analytes whose LCS recovery did not meet criteria.

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. Th se actions are not absolute: care and professional judgement should be used when qualifying data.

Reject all associated sample results for those analytes for which the LCS recovery was <50%. If the LCS results are outside the internal laboratory limits and if the matrix spike results are outside the CLP limits, and the laboratory did not reanalyze the samples, then reject all associated data.

List any analytes, the %R and any actions taken.

C.11.0 Graphite Furnace Atomic Absorption Quality Control

C.11.1	Were analytical spike recoveries calculated and written on the GFAA raw data?	[___]	___	___
C.11.2	Review the spike recoveries. Were all recoveries between 75-125%?	[___]	___	___
C.11.3	If not, was the Method of Standard Additions (MSA) used when required?	[___]	___	___
C.11.4	Were the correlation coefficients greater than 0.995?	[___]	___	___

RECOMMENDED ACTIONS: If sample absorbance is <50% of the post-digestion spike absorbance then, for sample results >IDL estimate the sample results. For non-detects, if the post-digestion spike recovery is >10% but <85%, estimate the detection limit (UJ). For post-digestion spike recovery <10%, reject the data. If MSA is required but not done, estimate the positive results. If the MSA correlation coefficient is <0.995, estimate the positive results.

List any analytes, affected samples, and any actions taken.

RECOMMENDED ACTION refers to the data qualification action suggested in the U.S. EPA Data Validation Guidelines. These actions are not absolute: care and professional judgement should be used when qualifying data.

APPENDIX D

APPLICABLE, RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

APPENDIX D

APPLICABLE, RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

1.0 CHEMICAL SPECIFIC ARARS

The following sections analyze federal and state requirements to determine whether or not they contain chemical specific standards that could be ARARs at NSB-NLON. Table 4-1 contains the status of each ARAR at each site. Table 4-2 is a listing of the most stringent chemical specific ARAR by media. These two tables, along with a further definition of ARARs, are found in Section 4.2 of this report.

1.1 Federal - Chemical Specific

Listed below is the chemical specific ARAR analyses for federal requirements.

Resource, Conservation and Recovery Act (RCRA) Hazardous Waste Standards **ARAR**

40 CFR Parts 260 through 270

NSB-NLON is a RCRA treatment, storage or disposal facility (TSDF), therefore, RCRA correction action requirements under Section 3004u are applicable to all Solid Waste Management Units (SWMUs). The following sites are classified as SWMUs:

- CBU Drum Storage Area
- Torpedo Shops
- Goss Cove Landfill
- Bunker A-86
- Area A Wetland
- DRMO
- OBDANE
- Spent Acid Storage and Disposal Area
- Waste Oil Tank at Former Gasoline Station
- Area A Landfill
- OBDA
- Waste Oil Pit of Building 79 at Lower Base

To date, final regulations have not been promulgated to address corrective actions for SWMUs. Interim final guidance regarding corrective actions, to be considered, is found in EPA 530/SW89031 RCRA Facility Investigation (RFI) Guidance. Region I personnel indicated that the clean-up standards used in the RCRA corrective action program are based upon chemical information contained in the Integrated Risk Information System (IRIS) and Superfund guidance on risk assessment. In addition, Region I has developed a document titled "Supplemental Risk Assessment Guidance for the Superfund Program" which they use in establishing clean-up standards. This is identical to the method they use for Superfund risk assessments. As a result, based upon existing guidance, the clean-up standards for SWMUs and those generated by Superfund risk assessments are the same.

Three of the investigation sites (Lower Base, DRMO and Spent Acid Storage and Disposal Area) contain RCRA hazardous waste deposited prior to 1980, therefore RCRA regulations will only be applicable if these wastes are excavated. Regardless, sections of the RCRA requirements

are relevant and appropriate to areas containing RCRA hazardous waste. Final regulations regarding RCRA wastes are found in 40 CFR 260 through 270. In particular, the chemical specific numerical values in the ground water monitoring sections (40 CFR 264 subpart F) and the land disposal restriction section (40 CFR 268) contain chemical specific ARARs. The ground water standards are based on Maximum Contaminant Levels (MCLs), therefore, these regulations contain no chemical specific standards more stringent than those contained in the Safe Drinking Water Act (refer to section below regarding the SDWA).

The chemical specific standards in the land disposal restriction regulations would only be ARARs if hazardous wastes are excavated and disposed at another onsite or offsite location.

RCRA Solid Waste Standards **Potential Future ARARs**

40 CFR 240 through 257

To date, solid waste regulations consist of recommended practices. No chemical specific standards have been promulgated under these standards other than the definition of an open dump which does reference MCLs and Water Quality Criteria (WQC). Future rule makings may be relevant and appropriate to some disposal areas and applicable to any new solid waste disposal areas created as part of remedial actions. The following areas contain solid waste: Goss Cove, DRMO, Area A, OBDA, OBDANE and Bunker A-86.

RCRA UST Standards **ARAR**

40 CFR 280

These standards apply to all the underground storage tanks except for those used or storing heating oil. 40 CFR Part 280, Subpart F contains standards regarding remedial actions for releases from underground storage tanks. No chemical specific standards are contained in these regulations. The UST standards do require "removal of free product to the maximum extent practicable as determined by the implementing agency". CERCLA clean-ups do not encompass petroleum products therefore, strictly speaking, these standards are only ARARs for sites with underground tanks or pits containing hazardous substances. Regardless, the Naval Installation Restoration Program does address petroleum products, therefore, for continuity the UST standards will be considered ARARs in this report even if only petroleum contamination is present. The following sites contain underground petroleum storage tanks: Lower Subase, Former Gasoline Station, and Torpedo Shops.

Safe Drinking Water Act **ARAR**

40 CFR 140 through 143

There are no public water supply wells located at NSB-NLON, therefore, SDWA requirements are not applicable. The base is located in an area that would have ground water classifications of Class II and III under EPA's guidelines for ground water classification and that have a GB/GA or GA classification pursuant to Connecticut's ground water classification system. The GB/GA designation means that ground water is presently known or presumed to be contaminated and that it is the State's long term goal to restore the ground waters to drinking water

quality. The GA designation means that ground water should be suitable for private drinking water supplies without treatment. The Class II designation is for ground waters that are not special highly valuable, irreplaceable drinking water sources, and that are current or potential sources of drinking water or have other beneficial uses. Class III ground water is not a potential source of drinking water and of limited beneficial uses. Class III ground waters include ground waters (1) with a total-dissolved solids (TDS) concentration over 10,000 mg/l or (2) that are so contaminated that they cannot be cleaned up using conventional water treatment methods.

As it is the goal of the state government to maintain or restore ground waters to drinking water quality, MCLs are relevant and appropriate requirements for the base. Proposed Maximum Contaminant Levels (PMCLs) should be considered when selecting a remedy at this site as they may soon replace the MCL being used for this purpose. Maximum contaminant level goals (MCLGs), secondary MCLs, and health advisories should also be considered at this site when developing a protective remedy when there are no MCLs.

The appropriateness of the state's GB/GA classification in areas that could be classified as Class III under the federal system and that are serviced by city water is questionable. These areas include Goss Cove, Lower Base, and DRMO. If not for the state designation, MCLs would not be ARARs in these areas. There is an administrative process to amend individual classifications.

Water Quality Criteria (WQC) **ARAR**

Section 304 of the Clean Water Act (CWA)

Water quality criteria are non-enforceable guidance developed under the Clean Water Act (CWA) and are used by the state, in conjunction with the designated use for a stream segment, to establish water quality standards under CWA 303. The state has classified the water quality of this segment of the Thames River as SC/SB. This classification is described as being suitable for fish, shellfish, and wildlife habitat; good aesthetic value; suitable for industrial cooling; and suitable for recreational boating and, in some places, bathing. The classification is further described as presently not meeting water quality criteria for one or more designated uses due to pollution. As these standards are non-enforceable guidance, they would not be applicable, however, many of the criteria are relevant and appropriate. In particular, the standards for in-stream water quality to protect aquatic organisms and those to protect human health from ingestion of fish are relevant and appropriate based upon designated water quality criteria goals for this section of the Thames River. Based upon information developed during the risk assessment, other values based upon more recent studies may be determined to be more appropriate than the water quality criteria.

There are several small streams and man-made drainage structures that transport storm water to the Thames River. It may not be appropriate to apply water quality criteria to protect aquatic life and for fish consumption to these surface waters.

All other water quality criteria (i.e., those to protect human health from ingestion of water and fish, and acute in-stream criteria to protect aquatic organisms) in certain circumstances, should be considered at this site when developing a protective remedy. Specifically, WQC for consumption of fish and water should be considered as potential clean-up standards for ground water when MCLs, PMCLs, MCLGs, or recent health advisories are not available. Acute aquatic WQC should be considered when there is no chronic criteria or criteria for fish consumption only.

Clean Air Act (NESHAPs) **Potential ARAR**

40 CFR Part 60

NESHAPs (National Emission Standards for Hazardous Air Pollutants) are a set of emissions of specific chemicals from specific production activities and would not be applicable, nor generally would they be relevant and appropriate. It is unlikely that any remedial actions will constitute listed productions processes under NESHAPs. NESHAP constituents (mercury, vinyl chloride and benzene) have been detected onsite, therefore, there is a possibility that selected remedial actions would make NESHAP standards relevant and appropriate.

Clean Air Act (NAAQs) (continued) **Potential ARAR**

40 CFR Part 50

National Ambient Air Quality Standards (NAAQs) are national limitations for ambient concentrations set for specific chemicals to protection national health and welfare. States develop State Implementation Plans (SIPs), which are reviewed and approved by EPA to meet these standards. Requirements set under the SIP are federally enforceable, and thus may become an ARAR. However, those requirements usually only apply to "major sources". No proposed remedial activities at NSB-NLON are expected to be classified as major. NAAQs do contain standards for lead and particulate matter which could potentially be relevant and appropriate to certain types or remedial actions.

Toxic Substances Control Act (TSCA) **Potential ARAR**

40 CFR Part 761

Among other requirements, TSCA authorizes EPA to establish regulations for the control of chemical substances or mixtures that pose an imminent hazard. To date, such regulations have been developed for polychlorinated biphenyls, fully halogenated chlorofluoroalkanes, and asbestos. The applicability and relevance of the PCB standards will be discussed below. Asbestos and halogenated chlorofluoroalkanes are not believed to be present in soil or ground water at NSB-NLON. EPA under TSCA reviews data on thousands of chemicals each year and from these preliminary reviews decides if a detailed review is warranted to determine if regulations are necessary. Part of this detailed review is a risk assessment. Risk assessments have not been performed on any of the chemicals found at this site.

PCB regulations under TSCA regulate the manufacture, use, storage and disposal of PCBs, and the cleanup of PCB spills. In general, these standards only apply to PCB items with concentrations above 50 ppm or to materials contaminated from such items. Four sites (Torpedo Shop, Area A, DRMO and Goss Cove Landfill) contain detectable levels of PCBs. None of these areas contain soil or ground water with PCB concentrations above 50 ppm. It is believed, based upon information provided by NSB-NLON, that the PCB contamination in Goss Cove, DRMO and Area A Landfill resulted from the storage/disposal of PCB items with PCB concentrations greater than 50 ppm. The source of PCB contamination at the Torpedo Shops is unknown.

The PCB regulations contain USEPA's spill cleanup policy which includes chemical specific guidance applicable to PCB spills which occurred after May 4, 1987. The contamination at Goss Cove and DRMO is believed to have occurred prior to May 4, 1987. As this is a policy and not a regulatory standard, and as it applies to spills which occurred after May 1987, the USEPA cleanup policy is not considered to be an ARAR. The policy, however, is to be considered. The policy contains numerical standards for solid surfaces and soils located in outdoor electrical substations, restricted access areas, and nonrestricted access areas. The standards for soils are 10 ppm PCBs by weight in non-restricted areas and 25 ppm PCBs by weight in restricted areas. Non-restricted areas include residential/commercial areas.

Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) — Not ARAR

40 CFR Part 165 (recommended procedures) and 180 (tolerance levels)

Under FIFRA, USEPA regulates the sale, distribution, use, storage, and disposal of all pesticide products in the United States. EPA accomplishes this primarily by product registration and labeling requirements. It is illegal to dispose of a pesticide in a manner inconsistent with its label. No pesticide products have been detected at NSB-NLON, therefore this part of FIFRA is not a potential ARAR. Applied pesticides are not considered products. CERCLA cleanups do not encompass applied pesticide products, therefore, strictly speaking, these standards should not be ARARs at NSB-NLON except for at pesticide disposal areas. Regardless, the Naval Installation Restoration Program does encompass applied pesticides.

In addition to the labeling requirements, EPA has promulgated tolerance levels for pesticides and pesticide residues in or on raw agricultural commodities under the authority of Federal Food, Drug and Cosmetic Act.

At NSB-NLON, no agricultural commodities or wildlife are obtained for consumption, therefore, these tolerance levels are not potential ARARs. DDT and its metabolics are the only substances found at NSB-NLON for which tolerance levels have been established. These values should be considered when developing a protective remedy.

1.2 State of Connecticut Chemical Specific

Listed below is the chemical specific ARAR analyses for State of Connecticut requirements.

Hazardous Waste Management Regulations — ARAR

22a-449(c)-100 through 110 RCSA (Regulations of Connecticut State Agencies)

Rationale for ARAR status is the same as for federal RCRA which is described above. For all applications to chemical specific ARARs, Connecticut's regulations are identical to EPA's.

Solid Waste Management Regulations — Not ARAR

These regulations apply to solid waste disposal areas. Potentially the following areas at NSB-NLON could be considered Solid Waste Disposal Areas (SWDAs) under these requirements:

- Goss Cove;
- DRMO;
- Area A;
- OBDA;
- OBDANE; and
- Bunker A-86.

These regulations, among other requirements, prohibit open dumps, require permits to construct and operate SWDAs, contain standards for operation of SWDA to prevent hazards to human health or the environment, and have standards for closure of SWDAs. There are no chemical specific standards other than a reference to Connecticut's Water Quality Standards and Criteria, and standards for quality of public drinking water. Both of these standards are considered ARARs, therefore, the solid waste management regulations do not contain any new chemical specific ARARs.

Underground Storage Tank Regulations **ARAR**

22a-449(d) RCSA

These regulations contain standards applicable to non-residential underground storage tanks containing liquid oil or petroleum products, except for tanks under 2,100 gallons in size used solely for onsite heating or intermittent power generation. These regulations are applicable to the underground storage tanks located in the sites investigated under this study. There are no numerical chemical specific standards in the regulations. If a failure is determined, the owner is required to immediately cease such discharge and reclaim, recover and properly dispose of the discharged liquid and any other substance contaminated by it, restore the environment to a condition and quality acceptable to the commissioner, and repair damage caused by the discharge, all to the satisfaction of DEP. To the extent that these regulations require removal of free product, they will be considered ARARs. The above section regarding RCRA UST regulations should be referred to regarding the cleanup of petroleum products under CERCLA.

Pesticide Regulations **Not ARAR**

22a-174-1 through 29 RCSA

These regulations pertain to pesticide registration, classification, discarding of pesticide containers, and use of pesticides. There are no pesticides found at the site other than residuals of DDT and its metabolites in soil. As such, those regulations are not applicable. Neither are they relevant or appropriate as the regulations pertain to pesticide products and their use.

Air Pollution Control Regulations **Potential ARAR**

22a-174-1 through 20 RCSA

The applicability of New Source Performance Standards (NSPS) and National Ambient Air Quality Standards (NAAQS) under the state program is relevant and appropriate as described in the above section regarding the Federal Clean Air Act. Connecticut's Ambient Air Quality Standards are listed in Section 22a-174-24 RCSA and requirements regarding performance standards are in section 22a-174-3 RCSA.

Other significant potential ARARs in Connecticut's regulations regard requirements for fugitive dust, control of odors, and, most importantly, those regarding hazardous air pollutants.

Nuisance odors are prohibited by state regulations. There are numerical standards for twelve compounds, four of which are present at the NSB-NLON (methyl ethyl ketone, tetrachloroethene, toluene and phenol). All other nuisance odors are determined by the DEP, primarily by the ability to detect an odor in ambient air that has been diluted seven to one.

Under Connecticut's regulations, persons must take reasonable precautions to prevent the emission of fugitive dust. Reasonable precautions are further defined in the regulations 22a-174-18(b)(i) through (v), RCSA.

Connecticut's hazardous air pollutant regulations control over 800 different chemicals. Basically, these regulations prohibit the emission of any hazardous air pollutants from any stationary source at a concentration at the discharge point above maximum allowable stack concentrations. Maximum ambient stack concentrations are calculated to insure that listed Hazardous Limit Values (HLV) are not exceeded at the property line of the facility. HLVs for hazardous air pollutants for eight hour and 30 minute averaging times are listed in the regulations. These standards may be applicable to certain types of remediation such as air stripping. Although not generally applicable, particularly to non-stationary sources, these standards do appear relevant and appropriate as they contain ambient air standards for hazardous constituents. If available, the eight hour standard would be the relevant and appropriate requirement. If not available, the 30 minute standard will be used. For some inorganic compounds there are no standards relevant to the form of the compound, e.g., dust versus fumes versus oxides. In those cases the HLV that most closely relates to NSB-NLON will be a "to be considered" material, and the chemical form the standard applies to directly will be noted in the comment section of Table 4-2.

Standards of Water Quality **ARAR**

22a-426 CGS (Connecticut General Statutes)

These standards specify Connecticut Water Quality Standards and Classifications for surface and ground waters. The classification given by the state designates the desired use for waters of the state and, therefore, will dictate which water quality criteria are relevant and appropriate and will dictate whether or not standards in the state and federal Safe Drinking Water Act are relevant and appropriate. For example, if the designated surface water use is as a source of drinking water, MCLs and water quality criteria to protect human health from ingestion of water and fish would be ARARs. There are no actual numerical values in these statutes, however, they are the key factor in determining if values from other environmental programs are applicable, relevant or appropriate. Waters of the state include ground and surface waters. For further detail, refer to the above sections on Federal WQC and SDWA.

Water Pollution Control **Not ARAR**

22a-426 through 22a-438 CGS

These statutes and regulations govern, among other things, potential sources of pollution to the waters of the State and permits for discharges to the waters of the State. Waters of the State

include ground and surface waters. To date, the requirements for a permit have not been applied to inactive disposal areas. Orders to correct potential sources of pollution have been issued to several inactive disposal sites. There are no numerical standards in the statute, regulations, or orders, however, decisions made regarding cleanup standards under these orders should be considered. In particular, the state guidance regarding contaminated soil remediation should be considered. This guidance sets chemical specific standards to define clean soil based upon the ground water classification of an area. In areas such as NSB-NLON with a ground water classification or goal of GA the state guidelines define "clean" soils as those that leach metals below MCLs as determined by the EP Toxicity test, or for volatile organic contamination those soils that contain concentrations below the Connecticut DOHS action level on a mass basis, i.e., the mg/kg concentration in soil must be below the mg/l action level concentration for drinking water. It should be noted that the newer, more aggressive TCLP rather than the EP Toxicity test procedures was used for this investigation. The overall policy of the DEP is to stay away from numerical standards and rely on case-by-case decisions based upon site specific environmental setting, location of receptors, and ground and surface water classifications and goals. In selecting a remedial design, the state guidelines will be considered as a screening tool, however, final selection of a remedial design will rely primarily on a case-by-case analysis, i.e., the risk assessment.

Standards for Quality and Adequacy of Public Drinking Water **ARAR**

19-13-B101 through B102 RCSA

These regulations are similar to the federal SDWA requirements and will be considered ARARs for the same reasons explained in the above section on SDWA ARARs. As stated above, there are no public water supplies at the NSB-NLON. There is one private water supply located in a residential property along Route 12. This property was recently purchased by NSB-NLON. Regarding chemical specific standards, it should be noted that Connecticut has established MCLs for copper and cyanide. Connecticut also has a standard for EDB (ethylene dibromide) in private water supplies. The State of Connecticut has developed action levels for several chemicals. Action levels are defined as the limit that, when exceeded, could reasonably create a health risk to persons using the water for drinking or other purposes. These action levels should be considered when developing a protective remedy.

2.0 LOCATION SPECIFIC ARARS

The following sections analyze federal and state rules to determine whether or not they contain location specific standards that could be ARARs at NSB-NLON.

2.1 Federal - Location Specific Standards

Listed below is the location specific ARAR analyses for federal requirements.

RCRA Location Standards **Potential ARAR**

40 CFR 264.18

Only the Lower Base and the DRMO investigation sites contain hazardous waste and have

portions located in or adjacent to the 100 year flood elevations (see Figure D-1). Areas containing hazardous waste must be designated, constructed and operated, and maintained to avoid washout.

There are no Holocene age faults, salt domes, underground mines, or caves at the NSB-NLON.

CWA, Section 404, and the Rivers and Harbors Act, Section 10 **Potential ARAR**

40 CFR 230 and 33 CFR 320-330

These standards regulate the discharge of dredged or fill material into navigable waters of the United States, including adjacent wetlands, and alterations, including structures and filling, in navigable waters of the United States. The DRMO, Area A, OBDA, Goss Cove, and Lower Base sites are located in wetlands, or adjacent to navigable waters, as shown in Figure D-1. The Thames River is a navigable water of the United States. As a result, these standards would be applicable to the above listed sites if regulated activities are conducted.

Executive Order 11988, Floodplain Management and Executive Order 11990, Protection of Wetlands **Potential ARAR**

These orders require federal agencies, wherever possible, to avoid or minimize adverse impacts of Federal actions upon wetlands and floodplains, and to preserve and enhance the natural value of wetlands and floodplains. The following sites have sections located in floodplains or wetlands:

- DRMO;
- Area A;
- OBDA;
- Goss Cove; and
- Lower Base.

As a result, these requirements would be applicable to the listed sites if regulated activities are conducted.

National Historic Preservation Act **Not ARAR**

16 USC Parts 470 et seq., 36 CFR Part 800

This act requires that any historical or cultural resources included on or eligible for inclusion on the Natural Register of Historic Places be identified. If such historical places or cultural resources are not present, or will not be affected, no further investigation regarding compliance with this act is necessary.

In preparing a draft environmental impact statement for the Thames River Dredging Project, a Phase I-A cultural resources survey was conducted in May, 1990. This investigation considered an approximately four mile section of the Thames River from its mouth on Long Island Sound northward to the Navy Subase at New London. Only four historic archeological sites were recorded in the general vicinity of the proposed dredging project area. The only site located in the

vicinity of any of the site investigation areas is the U.S.S. Nautilus Memorial, designated a National Historic Landmark in 1982, and towed to the Navy Subase in 1985. It is presently a popular tourist attraction. This landmark, however, will not be affected by any potential remedial activities.

Endangered Species Act **Not ARAR**

16 USC Part 1531 et seq.

This act provides a means for conserving various species of fish, wildlife, and plants that are threatened with extinction. This act protects endangered species themselves and critical habitats for endangered species. In preparing a draft environmental impact statement for the thames River Dredging Project, both CTDEP and the United States Fish and Wildlife Service were contacted regarding the existence of threatened or endangered species in the vicinity of the proposed dredging project. This area includes all the investigation sites under this study. No known threatened or endangered species are known to exist in the project area. Furthermore, the ecological survey for the risk assessment did not detect the presence of any endangered species at NSB-NLON.

Wild and Scenic Rivers Act **Not ARAR**

16 USC Part 1271, et seq., 36 CFR Part 297

This act established requirements applicable to projects affecting designated and proposed wild, scenic, or recreational rivers within the National Wild and Scenic Rivers System. The Thames River nor any of its tributaries on the NSB-NLON property are designated or proposed to be designated as wild, scenic, or recreational rivers. As such, this act is not a potential ARAR.

Fish and Wildlife Coordination Act **Potential ARAR**

16 USC Part 661 et seq., 40 CFR Section 122.49

This act is to protect fish and wildlife when Federal actions result in the control or structural modification of a natural stream or body of water. No controls or modifications are likely as part of potential remedial actions at this site. Regardless, this act is considered a potential ARAR as the Navy is a federal agency and natural bodies of water are present.

Coastal Zone Management Act **Potential ARAR**

16 USC Part 1451 et seq.

This act requires that federal agencies conducting or supporting activities directly affecting the coastal zone perform these activities in a manner that is consistent with approved State coastal zone management program. Connecticut does have an approved Coastal Zone Management Program. The following sites, as shown in Figure D-1, are located within the coastal boundary: DRMO, Lower Base, Former Gas Station, and Goss Cove. As a result, remedial designs for these sites should consider this act, even though it is unlikely that activities regulated under this act will be conducted at this site.

Wilderness Act **Not ARAR**

16 USC Parts 1131 et seq.

This act creates the National Wilderness Preservation System in order to preserve the wilderness character of any designated areas. There are no wilderness areas within the project area.

Clean Air Act NAAQS **Potential ARAR**

40 CFR Part 50

EPA under the CAA has promulgated NAAQS for six pollutants which are referred to as criteria pollutants. Based upon these standards, air quality control regions throughout the country are classified as attainment or non-attainment for each criteria pollutant depending upon whether they meet the standard (attainment area) or do not meet the standard (non-attainment area). The NSB-NLON is located in the Eastern Connecticut (No. 41) air quality control region. This region is classified as an attainment area for total suspended particulates (TSP), sulfur dioxide (SO_2), carbon monoxide (CO), and nitrogen dioxide (NO_2), and non-attainment for ozone (O_3).

Major sources of air pollution must comply with specific standards that vary depending upon whether the source is in an attainment or non-attainment area. It is not anticipated that any remedial activities will be classified as a major source. The definition varies for pollutant, process and attainment status, however, most sources that generate less than 100 tons per year of a criteria pollutant are not classified as major sources.

2.2 State of Connecticut - Location Specific Standards

Listed below is the location specific ARAR analyses for State of Connecticut requirements.

Inland Wetlands or Watercourses **Potential ARAR**

22a-39-1 through 15 RCSA

Under these laws the CTDEP, or a municipality that has adopted its own wetlands program may regulate "any operation within or use of a wetland or watercourse involving removal or deposition of material, or any obstruction, construction, alteration or pollution, of such wetlands or watercourses".

The Thames River and designated inland wetlands are shown in Figure D-1. The following sites contain inland wetlands: Area A and Overbank Disposal Area. As such, if remedial activities constitute regulated activities under these rules and regulations, they will be ARARs.

Tidal Wetlands **Not ARAR**

22a-30-1 through 17 RCSA

The CTDEP regulates activities in the tidal wetlands under these rules and regulations. A permit must be obtained from CTDEP prior to conducting a prohibited activity. The following

activities are prohibited: draining, dredging, excavation, or removal of soil, mud, sand, gravel, aggregate or rubbish of any kind; or dumping, filling, or depositing thereon of any soil, stones, sand, gravel, mud, aggregate of any kind, rubbish or similar material, dumped either directly or otherwise; or the erection of structures, driving of pylons, or placing of obstructions, whether or not they change the tidal ebb and flow.

There are no designated tidal wetlands at NSB-NLON, therefore, these rules are not potential ARARs.

Sanitation of Watersheds, 19-13-B32 RCSA **Not ARAR**

These regulations concern watershed areas and specify set-back distances, and have disposal prohibitions into watercourse tributaries to public water supply. As the NSB-NLON has no public water supplies onsite, nor is it tributary to any water supply areas, these regulations are not potential ARARs.

Agricultural Lands Preservation, 22a-26gg-1 through 8 RCSA **Not ARAR**

These regulations regard preservation of historical farmlands and the processes to change land use designations. None of the investigation sites at the NSB-NLON are classified as historical farmlands, therefore, these regulations are not potential ARARs.

Connecticut Siting Council Hazardous Waste Management Facility Siting Regulations

22a-116-B-1 through 11 and 22a-122-1 RCSA **Potential ARAR**

These regulations contain administrative procedures for the Connecticut Siting Council regarding the issuance of certificates of public safety and necessity to new hazardous waste disposal facilities. Within the regulations are minimum separation distances between active portions of a facility and facility property lines. As these rules only apply to new facilities, they would only apply to remedial activities at NSB-NLON if it is necessary to construct new disposal facilities. Disposal facilities are defined as incinerators, long-term storage facilities (greater than one year), or land disposal facilities.

Coastal Zone 22a-92 & 94 CGS **Potential ARAR**

Areas located within the coastal zone boundary are identified in Figure D-1 and include the following investigation sites: Goss Cove, Former Gas Station, Lower Base and DRMO. As such, any remedial activities directly affecting the coastal zone must be done in a manner consistent with Connecticut's Coastal Zone Management Program.

Connecticut RCRA Program 22a-449(c) 100 through 110 RCSA **Potential ARAR**

See discussion on federal RCRA standards. There are no significant differences regarding location standards between federal and state regulations.

Stream Channel Encroachment **Not ARAR**

22a-342 to 350 CGS

These statutes prohibit the establishment of any obstruction or encroachment, without a

permit from the DEP, within designated stream channel encroachment lines. There are no stream channel encroachment lines established in this section of the Thames River. As a result, these standards are not potential ARARs.

Aquifer Protection Areas **Not ARAR**

22a-354a through 356 CGS

These statutes provide for the municipal regulation of various activities in aquifer protection areas. These statutes came from public acts 88-324, 89-305, and 90-275. As of this date regulations and mappings under this statute are not complete. The NSB-NLON property is not presently an existing well field and to date has not been identified as a potential well field area. As such, any future regulations would not be ARARs.

Regulation of Dredging and Erection of Structures and Placement of Fill in Tidal, Coastal or Navigable Waters **Potential ARAR**

22a-359 through 363 CGS

These statutes control activities in navigable waters of the state waterward of the high tide line. It is unlikely that remedial activities that constitute regulated activities under this statute will take place. Regardless, as the Thames River is a navigable waterway, there is a potential for such activities as a result this statute is a potential ARAR for sites adjacent to the Thames River.

Storage of Hazardous Substances Near a Watercourse **Potential ARAR**

22a-134p CGS

This law regulates storage of hazardous substances pursuant to Section 302 of the Emergency Planning and Community Right-to-Know Act near watercourses. The Thames River is a watercourse. Regulations have not yet been promulgated under this statute. It is unlikely that the regulations will be applicable to remedial actions at NSB-NLON as no defined hazardous substance products have been found at the base, regardless, they may be relevant and appropriate to the extent that they will specify best management practices for the storage of hazardous substances.

3.0 ACTION SPECIFIC ARARS

Action specific ARARs cannot be specifically defined until remedial alternatives have been selected during the Feasibility Study. When the detailed analysis of alternatives is made during the Feasibility Study, action specific ARARs can be defined. This list was compiled with the understanding that there are no asbestos, radioactive materials, or pesticides present onsite except for the presence of DDT and its metabolites in soils.

3.1 Federal Action Specific ARARs

Listed below is the action specific ARAR analyses of federal requirements.

Federal RCRA Hazardous Waste Regulations **Potential ARAR**

40 CFR 260 through 272

The only contaminants at the Navy Subase that originate from listed hazardous wastes are the organic solvents detected in soil and ground water near Building 79. The only areas containing characteristically hazardous waste are the Lower Base, DRMO and the Spent Acid Storage and Disposal Area sites. In these three areas, soils contain TCLP lead concentration above the regulatory threshold. These regulations govern the generation, transportation, treatment, storage or disposal of those soils or ground water. RCRA will be applicable, or relevant and appropriate to wastes removed from these three sites. The disposal standards would only be applicable onsite if the waste was excavated and redeposited onsite as these wastes were deposited prior to the implementation of the RCRA regulation (11/19/80).

Federal RCRA Underground Storage Tank Regulations **Potential ARAR**

40 CFR 280

These rules govern corrective actions for leaks from underground storage tanks. These requirements will be applicable to several of the underground storage tanks and relevant and appropriate to underground storage tanks that are exempt from these regulations, i.e., those used solely for onsite heating. Strictly speaking, CERCLA only regulates hazardous substances. Oil is not classified as a hazardous substance under CERCLA. Regardless, the Naval Installation Restoration Program does address oil and petroleum contamination.

Federal RCRA Standards for Solid (Non-Hazardous) Waste Management **Potential ARAR**

40 CFR 240 to 257

To date, these regulations consist of a set of recommended procedures. This may change with future rule makings. These future recommendations may be applicable to any new solid waste disposal area and relevant and appropriate regarding any solid waste that is to remain in place.

USEPA Underground Injection Control **Potential ARAR**

40 CFR 1144 through 147

These rules would only be an ARAR if any of the remedial actions selected constitute underground injection. It is not likely that underground injection will be used at this site.

DOT Hazardous Materials Transportation **Potential ARAR**

49 CFR

For sites containing hazardous materials, these regulations may be ARARs if such hazardous materials are transported. The only sites with hazardous materials present are the Lower Base, DRMO, and the Spent Acid Storage and Disposal Area sites. At these sites, hazardous wastes which are classified as hazardous materials are present.

OSHA Standards, 29 CFR 1910.120 **ARAR**

As this is a federal Superfund site, these regulations are applicable to all investigation and remedial activities at the Naval Subase.

USEPA - NPDES, 40 CFR 122 through 125 **Potential ARAR**

NPDES (National Pollution Discharge Elimination System) permits are required for any discharges to navigable waters. If remedial activities include such a discharge, the NPDES standards would be ARARs.

USEPA and Army Corps of Engineers Rules Regarding Activities in Wetlands and Watercourses **Potential ARAR**

33USC 404, 33 CFR 320-330, 40 CFR 230

Certain activities such as dredging and filling in wetlands and watercourses require federal permits from the Army Corps of Engineers and the USEPA.

USEPA Review of New Sources and Modification **Potential ARAR**

40 CFR 60

These standards would only be ARARs if any remedial treatment technologies are classified as major sources. All major new sources require permits. It is unlikely that any remedial activities will be classified as major sources.

USEPA PCB Regulations Under TSCA **Potential ARAR**

40 CFR 761

These standards are potential ARARs at any site containing PCBs. The regulations govern, among other things, the storage, transportation and disposal of PCBs, and the cleanup of PCB spills. For the most part, these standards only apply to PCB items with concentrations above 50 ppm or to materials contaminated from such items. Several areas contain detectable levels of PCBs. None of these areas contain PCBs above 50 ppm. It is believed that the PCB contamination in Goss Cove, DRMO and Area A Landfill resulted from the storage of transformers containing greater than 50 ppm of PCBs. At the Torpedo Shop, the source of PCBs is unknown.

For the above listed sites, if contaminated soils are removed, the storage, transport and disposal requirements in the TSCA regulations would be ARARs.

National Environmental Policy Acts (NEPA) **Potential ARAR**

NEPA requires analysis of environmental impacts and consideration of alternatives for significant activities that are federally sponsored. Any remedial actions that constitute significant activity would make NEPA an ARAR.

3.2 State of Connecticut

Listed below is the action specific ARAR analyses of State of Connecticut requirements.

Water Pollution **Potential ARAR**

22a-430-1 through 8 RCSA

The State of Connecticut is the authority to issue NPDES and UIC permits. In addition, Connecticut requires permits for discharges to any surface or ground waters of the state. As a result, any remedial activities that constitute a discharge to waters of the state require a permit.

Solid Waste Management **Potential ARAR**

22a-209-1 through 13 RCSA

Solid wastes have been buried at the following sites: Goss Cove, DRMO, Area A, and OBDA, OBDANE and Bunker A-86. Therefore, if these materials are to be excavated and disposed, the new disposal site must have a permit to manage solid waste.

Hazardous Waste Management **Potential ARAR**

22a-449 (c)-100 through 110 RCSA

These standards are nearly identical to the federal RCRA regulations and are potential ARARs for the reasons described in that section. Two additional action specific requirements of the state are that transporters of hazardous waste must have a permit, and the underground injection of hazardous waste is prohibited.

Safe Storage and Transportation of Chemicals **Potential ARAR**

29-337-1 through 3 RCSA

These regulations directly reference 49 CFR which govern the transportation of hazardous materials. See the section on DOT hazardous materials regulations for a discussion of these regulations as ARARs.

Connecticut Siting Council Hazardous Waste Facility Siting Regulations **Potential ARAR**

22a-116-B1 through 11 RCSA

These regulations require a certificate of public safety and necessity from the Connecticut Siting Council prior to construction of any new hazardous waste disposal facility. The term hazardous waste refers to RCRA hazardous waste and PCBs, and the term disposal means landfilling, incineration or long term storage.

Regulations for the Well Drilling Industry **Potential ARAR**

25-128-33 through 64 RCSA

These rules apply to any new water supply or withdrawal wells; they do not apply to monitoring wells. If remediation involves installation of withdrawal wells, these rules will be applicable. The sections of these rules regarding monitoring well abandonment should be considered even though they are not applicable.

Air Pollution Control **Potential ARAR**

22a-174-1 through 29 RCSA

Permits are required for certain stationary sources of air pollution. Any remedial activity so defined would require a permit from CTDEP.

Transportation of Oils and Chemical Liquids **Potential ARAR**

22a-454 CGS

A permit is required from CTDEP to transport waste oils or chemical liquids.

Non-Residential Underground Storage Tanks **Potential ARAR**

22a-449(d) RCSA

These regulations would be ARARs for any remedial activities associated with failures of underground petroleum storage tanks at the Naval Subase.

Connecticut OSHA, 31-372-101-1910 RCSA **Not ARAR**

These regulations directly reference federal OSHA regulations, however, they only apply to state employees.

Control of Noise Regulations **Potential ARAR**

22a-69-1 through 7.4 RCSA

These regulations have allowable noise levels based upon noise class zones. Exempted from these regulations are mobile sources and construction noise. The Naval Subase would be classified as a Class C noise zone under these regulations. Any non-exempt remedial activities would need to comply with applicable standards.

The Connecticut Water Diversion Policy Act **Potential ARAR**

22a-365 through 378 CGS

A permit is required for any non-exempt diversion of waters of the State. To the extent that any remedial activities at this site constitute a non-exempt diversion, a permit from CTDEP is

required. A few examples of non-exempt diversions are wells, or withdrawals or discharges to surface waters greater than 50,000 gallons per day.

4.0 TBCs (TO BE CONSIDERED)

Listed below are federal and state requirements that will be considered in selection of a final remedy at NSB-NLON. Certain statutes or regulations contain both ARARs and TBCs. This list, in addition to listing requirements that are solely TBCs, details the TBC sections of the statutes or regulations that are also ARARs. Requirements that are also ARARs are so noted.

4.1 Federal TBCs

- Air/Superfund National Technical Guidance Study Series. Volume 1-4 (EPA/450/1-89/001-EPA/45-/1-89/004)

- Safe Drinking Water Act (ARAR)

  - Proposed MCLs (Maximum Contaminant Levels)
  - MCLGs (Maximum Contaminant Level Goals)
  - Proposed MCLGs
  - Secondary MCLs
  - Health Advisories

- CWA Water Quality Criteria (ARAR)

  - Standards to protect human health from water and fish ingestion

- RCRA Facility Investigation (RFI) Guidance (EPA 530/SW89031)

4.2 State of Connecticut TBCs

- Department of Health Services Action Levels for drinking water and for lead in soils under their Standards for Drinking Water Program (ARAR).

- Connecticut Department of Environmental Protection "Contaminated Soils Removal and Disposal Guidelines" under Water Pollution Control Authorities (ARAR).

- Guidelines for Soil Erosion and Sediment Control

APPENDIX E

HUMAN HEALTH RISK ASSESSMENT DATA

ONSITE ACTIVITY DATA

CBU DRUM STORAGE AREA

Access to area:

Occasional Naval personnel - contractors
Limited access. This is a secured area, but with no fence.

Current use of Area:

Drum storage area, in vicinity of trash pick-up area

Future use of this area:

None

CBU DRUM STORAGE AREA

Human Health Exposure Assessment

Current Activities:

Contractor trailers are parked over site

Exposure Groups:

Transient military personnel
Contractors

Number of People within the Identified Exposure Group Involved in the Activity:

Three to Four people

Activity:

Parking of Construction trailers

Frequency:

Monday through Friday

RUBBLE FILL AT BUNKER A-86

Human Health Exposure Assessment

FUTURE SCENARIOS

Number of People within the Identified Exposure Group Involved in the Activity:

????

Activity:

Involves excavation for sewer lines, and possibly a spreadfoot foundation

a. Amount of clothing worn during this activity.(gives the percentage of body exposure):

Typically 17 %

b. Time of year this type of activity occurs

Activity could occur in spring, summer and fall

Frequency:

This is a one-time event for contractors

Duration:

Eight hours

Period:

one time event for contractors
predicted two-six months

RUBBLE FILL AT BUNKER A-86

Scenario:

Primary activity is the excavation of soil for natural gas lines.
Naval public works employees, will dig the trenches. Natural gas employees, will install the gas lines.

Number of People within the Identified Exposures group Involved in this Activity:

Public works depends on how many natural gas lines are needed.

Activity:

Construction

a. amount of clothing worn during activity

Assume 17%

b. time of year activity occurs

Spring, summer, fall

Frequency:

One-time event

Duration:

Eight hours

Period:

One time event

RUBBLE FILL AT BUNKER A-86

Scenario:

Primary activity is the excavation of soil for natural gas lines.
Naval public works employees, will dig the trenches. Natural gas employees, will install the gas lines.

Number of People within the Identified Exposures group Involved in this Activity:

Public works depends on how many natural gas lines are needed.

Activity:

Construction

a. amount of clothing worn during activity

Assume 17%

b. time of year activity occurs

Spring, summer, fall

Frequency:

One-time event

Duration:

Eight hours

Period:

One time event

TORPEDO SHOPS

Source:

Bill Mansfield, Joe Simmons

Access to the area:

Area is highly restricted with surveillance and is fenced on all sides.

Current use of this area:

* Maintenance of utilities
* BLDG 325 used as administration and quality assurance offices for undersea weapons and for torpedo overhaul
* BLDG 450 serves as the primary torpedo overhaul assembly building facility
* Function of BLDG 477 unknown

Future use of this area:

* Build an addition onto the BLDG 325, will become a torpedo shop
* Construction of Auto reclaim facility, installation of utility lines

TORPEDO SHOPS

Human Health Exposure Assessment

CURRENT ACTIVITIES

Activity:

Maintenance of utilities

Exposure Groups:

Naval public works employees and civilian repair people

Number of People within the Identified Exposure Group Involved in the Activity:

Five to ten people

a. Type of clothing worn during activity

Typical attire for excavation

b. Time of year activity occurs:

Spring, summer, fall unless emergency in the case of water main break

Frequency :

Refer to excavation table

Duration:

Eight hours

Period :

Naval public works employees work in this capacity for 25 -35 years

TORPEDO SHOPS

Activity:

Office personnel working in BLDG 325 (used as administration and quality assurance offices for undersea weapons).

Exposure Groups:

Authorized Military Personnel (adults)

Number of People within the Identified Exposure Group Involved in the Activity :

100

a. Type of clothing worn during activity (gives the percentage of body exposure):

Business attire

b. Time of year activity occurs

Year-round, eating lunch outdoors in nice weather.

Frequency

Five days a week

Duration :

Eight hours

Period :

Authorized D.O.D. administrative staff can work in this capacity up to 35 years.

TORPEDO SHOPS

Activity:

Technicians who work in BLDG 450 (serves as the primary torpedo overhaul assembly facility).

Exposure Group:

Torpedo technicians.

Number of People within the Identified Exposure Group Involved in the Activity :

100

Activity :

a. Type of clothing worn during activity (gives the percentage of body exposed):

Welding machine shop workers. typically wear jumpsuits, gloves, safety glasses

b. Time of year activity occurs:

all year

Frequency :

Five days/week for D.O.D. civilian employees; seven days/week for military

Duration :

Eight hours/day for civilian employees sometimes 12 hours/day military

Period :

Torpedo technicians can work in this capacity for 35 years.

TORPEDO SHOPS

FUTURE ACTIVITIES

Activity:

Build an addition onto the BLDG 325, will become a torpedo shop

Exposure Group:

Construction workers

Number of People within the Identified Exposure Group Involved in the Activity:

Varies

a. Type of clothing worn during activity

Typical attire for construction

b. Time of year activity occurs:

Winter for internal construction, spring, summer, and fall for outdoor construction.

Frequency :

One-time event

Duration :

Eight hours

TORPEDO SHOPS

Activity:

Construction, installation of utility lines and excavation of foundation

Exposure Group:

Military Personnel (adults) which includes Naval public works employees; independent contractors & electricians

Number of People within the Identified Exposure Group Involved in the Activity:

a. Type of clothing worn during activity

Typical attire for construction b. time of year activity occurs: possibly year

b. Time of year activity occurs:

All year

Frequency :

One-time event 18 months

Duration :

Eight hours

GOSS COVE LANDFILL (NAUTILUS MUSEUM)

Sources:

Commander Allen Adel, Officer John Livingston, Joe Simmons

Access to the area:

Goss Cove Landfill is owned by the Navy and has security surveillance with potential access from the military highway (unpaved). A fence prevents access to the cove from the highway. Children can enter restricted property by following the railroad tracks.

Presently, there is no access to Goss Cove Landfill through the Nautilus Museum grounds. The gates to Museum and parking lot are locked after visiting hours.

The unpaved military highway along the Thames River will be designated a coastal viewing area, and the Town of Groton is presently building a parking lot and picnic area. Once the town finishes this Thames River estuary coastal viewing area, children could access Goss Cove.

Current Conditions:

The museum is open year-round six days a week, closed on Tuesdays. The Nautilus Museum heating system is forced hot air and oil heat. Hot water boiler in the museum works through heat exchangers which cool and heat the ship An underground fuel oil storage tank is located near the museum entrance. The parking lot is not prone to flooding.

Current use of ;this area:

* Conducting museum activities
* Surveillance
* Using the utility tunnel under Nautilus Museum
* Maintenance of utilities
* Tourists visiting Museum
* Building a parking lot for the new coastal (off-site)

Future use of this area:

* Visiting the state coastal picnic area (off-site)
* Construction of a public boat launch either on Naval property or within the new coastal park.
* Possible addition scheduled to be built onto the museum
* Storm drain construction through museum parking lot to be completed by contractors.

Condition of the area does not vary over the course of the year.

GOSS COVE LANDFILL (NAUTILUS MUSEUM)

CURRENT ACTIVITIES

Activity

Maintenance of utilities

Exposure Groups

Naval public works employees, and independent contractors.

Number of People within the Identified Exposure Group Involved in the Activity.

Five to Ten people

Activity

Excavation of soil to conduct repairs.

a. Amount of clothing worn during activity

Approximately 17%

b. Time of year activity occurs:

Year-round, unless emergency, such as water main break.

Frequency:

One-time event

Duration:

Eight hours/daily

Period:

Naval public works employees, as well as outside utility repair people, are usually employed in this capacity 25 to 35 years.

GOSS COVE LANDFILL (NAUTILUS MUSEUM)

Activity:

Accessing the utility tunnel from inside the Museum.

Exposure Groups:

Naval Public works employees

Number of People within the Identified Exposure Group Involved in the Activity

42

Activity:

When repairs are required, naval public works employees may be exposed to groundwater infiltration, or flooding with tunnel.

Time of year activity occurs:

Year-round

Frequency:

Refer to Excavation table

Duration:

Eight hours/daily

Period

Naval public works employees work in this capacity for 25-35 years

GOSS COVE LANDFILL (NAUTILUS MUSEUM)

Activity:

Civilian personnel working in the Nautilus Museum.

Number of People within the Identified Exposure Group Involved in the Activity

Five

Activity:

Working inside Museum

Time of year activity occurs:

Year-round

Frequency:

Five day/week assuming they work one day during the weekend. 50 weeks/year.

Duration:

Eight hours/daily

Period

Civilian Administrative personnel may work in this capacity for a maximum of 25 to 30 years according to Commander Adel.

GOSS COVE LANDFILL (NAUTILUS MUSEUM)

Activity:

Surveillance of Nautilus Museum grounds.

Exposure Group:

Military security personnel

Number of People within the Identified Exposure Group Involved in the Activity

Three

Activity:

Outdoor surveillance of the grounds

Time of year activity occurs:

Year-round

Frequency:

Five to six days/week (includes one over-night shift).

Duration:

Eight hours/daily

Period

The military serve a three year tour of duty.

GOSS COVE LANDFILL (NAUTILUS MUSEUM)

Activity:

Military Officers working under Commander Adel, rotate between ship and office duties.

Exposure Group:

Military security personnel

Number of People within the Identified Exposure Group Involved in the Activity

Thirty

Time of year activity occurs:

Year-round

Frequency:

Five to six days/week (includes one over-night shift).

Duration:

Eight hours/daily

Period

Military serve a three year tour of duty.

GOSS COVE LANDFILL (NAUTILUS MUSEUM)

Activity:

Tourists (adults and children) visiting Nautilus Museum and playing on the grounds.

Exposure Group:

Adults and children ranging from ages 5 and up.

Number of People within the Identified Exposure Group Involved in the Activity

Museum receives 270,000 visitors annually, including children. During peak months, July and August, 2,000 people daily.

Activity:

Children visiting the Museum may escape surveillance, playing or climbing into Goss Cove. with possible exposure to surface water and soils.

Type of clothing worn during activity

Shorts, sneakers T-shirts

Time of year activity occurs:

May through September

Frequency:

One-time event .

Duration:

Approximately two hours

Period

Usually a one-time.event

GOSS COVE LANDFILL (NAUTILUS MUSEUM)

Activity:

Residents visiting the Nautilus Museum and coastal park Children playing along the Goss Cove shoulder.

Exposure Group:

Adults and children ranging from ages 5 and up.

Number of People within the Identified Exposure Group Involved in the Activity

Museum receives 270,000 visitors annually, including children. During peak months, July and August, 2,000 people daily.

Activity:

Children visiting the Museum may escape surveillance, playing or climbing into Goss Cove. with possible exposure to surface water and soils.

Type of clothing worn during activity

Shorts, sneakers T-shirts

Time of year activity occurs:

May through September

Frequency:

One-time event .to the Museum. Visiting coastal park between May and September more frequently over an average 13-year period.

Duration:

Approximately two hours/daily

Period

The children live in the area until they are 18, potentially visiting the coastal park between five to 18 years of age.

SPENT ACID STORAGE AREA ADJACENT TO BUILDING 410

Sources:

Bill Mansfield and Joe Simmons

Access to the area:

Not limited

Current use of this Area:

* Present site is below parking area
* Maintenance of utilities (one is under building)

Future use of this area:

* Build a new warehouse, excavate to a minimum of four to five feet, either reconstruct or replace utility lines to be done by civilian contractor.
* Demolish Buildings 408, 409 and 410

The condition does not vary over the course of the year.

SPENT ACID STORAGE AREA ADJACENT TO BUILDING 410

CURRENT ACTIVITIES

Activity:

Maintenance of utilities and excavation of soil to access the utility lines.

Exposure Group:

Naval public works employees and independent utility workers.

Number of People within the Identified Exposure Group Involved in the Activity:

Approximately forty

a. Type of clothing worn during activity

Typical construction clothing

b. Time of year activity occurs:

Unless emergency (in the case of a water main break), spring, summer and fall.

Frequency:

Refer to Excavation Table

Duration:

Eight hours

Period:

Naval public works employee can work in this capacity for 25 to 35 years

SPENT ACID STORAGE AREA ADJACENT TO BUILDING 410

FUTURE ACTIVITIES

Activity:

Building a warehouse to replace building 33 (involves stripping concrete pavement to four to five feet either construct or remove old utility lines). To be done by civilian contractor.

Exposure Groups:

Private contractors

Number of People within the Identified Exposure Group Involved in the Activity:

Approximately forty

Activity

Involves stripping concrete pavement four to five feet, constructing or removing old utility lines. (To be done by civilian contractor. Estimate three - six months for excavation of old pavement and laying down of new foundation.

Time of year activity occurs:

Most of the excavation will take place in the spring, summer and fall .

Frequency:

One-time event, lasting approximately 18 months

Duration:

eight hours/daily

Period:

One-time event for contractors

FORMER GASOLINE STATION

Sources:

Bill Mansfield and Joe Simmons

Access to the area:

Not limited. Area is under street

Current use of this area:

* Activities ongoing in Building 164 Dealey Center, Movie Theater, Credit Union, Bank, Burger King , Library, Newsstand, Recreations Services Office, Lifeco Travel, Chaplains Office, Post Office, Dockside Mail and Barber Shop.
* Building 96 Counseling and Assistance Center
* Building 168 Base Chapel
* Area in front of Buildings 164, 96 and 168 (location of former gasoline station) is paved
* Maintenance of utilities

Future use of this area:

* Demolish Building 96, use of former gasoline station are to remain the same.

FORMER GASOLINE STATION

Human Health Exposure Assessment

CURRENT ACTIVITIES

Activity:

Visitors to the Dealey Center
Activities ongoing in Building 164 Dealey Center, Movie Theater, Credit Union, Bank, Burger King , Library, Newsstand, Recreations Services Office, Lifeco Travel, Chaplains Office, Post Office, Dockside Mail and Barber Shop.

Exposure Groups:

Adults and children

Number of People within the Identified Exposure Group Involved in the Activity :

The Dealey Center receives numerous visitors annually

Frequency:

Multiple visits, or one-time event to the Dealey Center

Duration :

Two plus hours

Period:

Multiple visits or one-time event over the visitor lifetime

FORMER GASOLINE STATION

Activity:

Maintenance of water mains, sanitary and storm sewers

Exposure Group:

Navy public works employees and independent utility workers.

Number of People within the Identified Exposure Group Involved in the Activity:

11 Laborers and operating engineers
12 electricians
18 pipe fitters
total = 41 in Naval Public Works Dept.

Activity :

Excavation of soil to access the utility lines

Time of year activity occurs:

Unless water mains breaks, spring, summer and fall.

Frequency :

Refer to Excavation table

Duration :

Eight hours

Period:

Navy public works employees usually work in this capacity 25 -35 years

FORMER GASOLINE STATION

Activity:

Daily visits by employees

Exposure Group:

Personnel on base

Number of People within the Identified Exposure Group Involved in the Activity:

Activities ongoing in Building 164 Dealey Center, Movie Theater, Credit Union, Bank, Burger King , Library, Newsstand, Recreations Services Office, Lifeco Travel, Chaplains Office, Post Office, Dockside Mail, Barber Shop; BLDG 96 counseling and assistance Center Building 168 Base Chapel.

Time of year activity occurs:

Daily

Frequency :

Three - five weeks

Duration:

Varies, depending on purpose of visit, varying from between five minutes to 2 hours

Period:

Maximum length of employment on base for employees is 35 years.

FORMER GASOLINE STATION

Activity:

Daily operation ongoing in Dealey Center and Counseling Center during five day work week

Exposure Group:

Military Personnel and civilians (adults)

Number of People within the Identified Exposure Group Involved in the Activity:

Several people employed in Buildings 164, 96 and 168, Chaplain's Office, Counseling Services, theater personnel, Burger King, post office, newsstand, travel agency, library

Activity :

Recreational services, administrative duties, Chaplain, counseling services, operating the theater, Burger King, post office, newsstand, travel agency, library are being performed on a daily basis.

Time of year activity occurs :

All year round

Frequency :

Assuming full-time position five days a week, 50 weeks a year

Duration :

Eight hours daily

Period:

Average 40 hour week, fifty weeks per year, totaling 2000 hours

FORMER GASOLINE STATION

FUTURE ACTIVITIES

Activity:

Demolishment of building 96 and removing old utility lines by civilian contractors

Exposure Groups:

Private contractors

Frequency:

One-time event

Duration:

Eight hours

Period:

One-time event for contractors

AREA A LANDFILL

Source

Bill Mansfield, Frank Delcarmen, Chief Dregger, Joe Simmons

Access to the area:

Area A Landfill storage, is open from 8:00 am to 4:00pm Monday through Friday. The facility is closed all other times. A dirt road southeast of North Lake and off Wahoo Ave leads to the landfill area, Another dirt road (which could be considered an extension of Thresher Ave from Hobby shop) goes through Deployed parking and eventually intersects with the landfill.

Current use of this area:

* Transient military personnel (security).
* Placement of trash and outdoor storage of large items (copy of operation procedures in the landfilmaterial stored is palliated.
* Storage of trailers belonging to independent contractors.
* Daily trash pickup
* Building 496 unoccupied electrical shop.
* Car auction from the deployed parking area
* Sandbagging activity during the summer by restricted enlisted personnel

Future use of this area:

Reorganization of Area A landfill

Condition of Area

The condition of the area does not vary significantly over the course of the year

AREA A LANDFILL

Human Health Exposure Assessment

CURRENT ACTIVITIES

Activity:

Delivery of palettes for large items to be stored from the base

Exposure Groups:

Transient military personnel

Number of People within the Identified Exposure Group Involved in the Activity :

Three to Four people

Activity :

Placement of large items to be stored on palettes

Time of year activity occurs:

All year

Frequency :

Monday through Fridays

Duration :

20 minutes per day

Period :

Two months

AREA A LANDFILL

Activity:

Active trailers of independent contractors stationed in this area (usually storing materials being used for contract work).

Exposure Group:

Independent contractors

Number of People within the Identified Exposure Group Involved in the Activity :

Maximum of two people are seen using the trailer on daily basis.

Activity :

The trailers serve as a storage area for materials while conducting work on base,

Frequency :

Possible one-time event, depending on the contract. Average length of contracted work is two to three months. (One contractor has kept a trailer in Area A landfill for 9 months).

Duration :

Maximum of eight hours, with contractors periodically visiting the trailers during the day..

Period :

Independent contractors are employed by Navy for three to years.

AREA A LANDFILL

Activity:

Sandbagging activity during the summer by the restricted enlisted personnel.

Exposure Group:

Restricted military (mostly enlisted)

Number of people within the identified exposure group involved in the activity :

Three to four people

Activity:

Sandbagging by restricted enlisted personnel serving as punishment.

Frequency :

Possible one time event

Duration :

Two - three hours

Period :

Tour of shore duty lasts for approximately 3 years

AREA A LANDFILL

Activity:

Car auction in the deployed parking area

Exposure Group:

Military personnel and general public possibly with children,

Number of People within the Identified Exposure Group Involved in the Activity :

1-100 people at these auctions

Activity :

Auction off abandoned cars

Frequency :

Periodically

Duration :

Three to six hours.

Period :

Probable one-time event or occurring over a number of years depending on the individual

Tour of duty lasts for approximatly three years.

AREA A LANDFILL

FUTURE ACTIVITIES

Activity:

Re-organization of Area A Landfill

Exposure Group:

Restricted military enlisted or transient/transfer military

Number of people within the identified exposure group involved in the activity :

Eight to Nine people

Activity:

Moving storage items and palettes, hauling materials away.

Time of year activity occurs :

Anticipate spring or summer

Frequency :

One-time event

Duration :

Eight hours

Period :

Transient military enlisted are restricted for two months a years.

AREA A DOWNSTREAM WATERCOURSES & NORTH LAKE

Sources: **Bill Mansfield, Mike Paquette, Gina LaBaire, Mr. Vendetti, Pat Russak**

Access to the area:

Not limited, Area is available to Naval personnel and guests.

North Lake is a man-made swimming pond. North Lake is only available to Naval officers, their families and guests. The lake is filled with municipal water in the spring and drained each fall. During the months of operation, North Lake is chlorinated and a residual chlorine level of 0.2 mg/l is maintained. Snow and rainwater runoff collect in the Lake over the winter months. Ice skating is allowed on the Lake which is seasonally lowered three feet for this activity. A stream runs from OBDA and is speculated to discharge into the lake at periods of high flow.

North Lake is open for swimming the second week of June to Labor Day. During the weeks of operation, hours are from 11:00 am to 7:00pm. North Lake recreational area includes a playground, beach, picnic area and the man-made lake.

A fence surrounds the Junior officer housing complex preventing young children from crossing the road or wandering unattended.

Current use of this area: **(all activities including seasonal)**

* family picnics
* swimming in North Lake
* playing golf
* playing tennis
* summer camp, operating from last week of June to Labor day weekend
* ice skating

Future use of this area:

unknown

Does the condition of the area vary over the course of the year?

Seasonal

* family picnics
* swimming in North Lake
* playing golf
* playing tennis
* summer camp
* ice skating

AREA A DOWNSTREAM WATERCOURSES & NORTH LAKE

Human Health Exposure Assessment

CURRENT ACTIVITIES

Activity:

Family picnics

Exposure Group:

Junior officers and families, with children ranging from infants to toddlers.

Number of People within the Identified Exposure Group Involved in Activity:

53 children living on base
236 adults living on base (officers, spouses of enlisted Naval officers.)

During operation, 200 to 300 women and children visit this recreation area during a weekday, 400 people on weekends.

Activity:

Children of officers play in the wooded areas and streams adjacent to North Lake.
Families picnic, adults barbecue and families play games while sitting on the grass.

a. Type of clothing worn during activity (gives the percentage of body exposure).

Both children and adults may or may not be wearing shoes. Dress is casual (shorts, T-shirts) for recreational activities.

b. Time of year this type of activity occurs:

spring, summer and fall

Frequency:

Most military families stay in the Groton area for 3 years, according to Pat Russak.

Duration:

A minimium of 2-3 hours, a maximum of 6 hours. Average estimated time spent per event is 4 hours

Period :

Tour of shore duty for military is approximately 3 years with children of officers probably exposed to this activity for duration.

AREA A DOWNSTREAM WATERCOURSES & NORTH LAKE

Activity:

Summer camp program

Exposure Group:

The children of NSB-NLON employees, officers living on base, and active or retired military who live off base. Ages range from mostly toddlers to 12, with the average age being 9 years.

Number of People within the Identified Exposure Group Involved in the Activity:

70 children participate in summer camp.

Activity:

The summer camp's daily routine consists of a variety of on-base as well as off-base activities. The on-base indoor activities include, bowling, swimming lessons in the pool (life guard/pavilion building),

On-base outdoor activities include tennis and golf lessons, lunch and swimming at North Lake recreational area, playground activities. One hour golf lessons are given on putting greens (not actual golf course). Off-base activities involve fieldtrips to museums or parks, and nature walks. Children are under adult supervision. They do not continuously stay in the North Lake area.

The summer camp is moved to Rock Lake during official visits.

a. Type of clothing worn during activity

Children's clothing varies depending on the activity.

b. Time of year activity occurs:

Summer

Frequency:

The camp operates 5 days a week, (Monday thru Friday) from the last week of June to Labor Day.

Duration :

The daily operating hours usually are 9:00 am to 3:00 pm. Occasionally some children may be at camp from 6:00am to 4:00pm to accommodate working schedule of parents.

Period:

Most children attend this summer camp for three summers.

AREA A DOWNSTREAM WATERCOURSES & NORTH LAKE

Activity:

Swimming in North Lake

Exposure Group:

Junior officers and families, with children mostly consisting of toddlers up to pre-teens.

Number of People within the Identified Exposure Group Involved in the Activity:

53 children living on base
236 adults living on base (officers, spouses of enlisted Naval officers)

During operation, 200 to 300 women and children visit this recreational area during a weekday, 400 people on the weekend.

Activity:

Swimming

a. Type of clothing worn during activity

Clothing will vary according to activity

b. Time of year this type of activity occurs:

Weeks of operation for North Lake are from the second week of June to Labor Day.

Frequency:

Could be seven days a week

Duration:

A maximum of two hours

Period:

Average time Junior officers are stationed on base is approximately three years.

AREA A DOWNSTREAM WATERCOURSES & NORTH LAKE

Activity:

Playing Golf

Exposure Group:

Golfers range from 10 to 80 years, (men and women). Military and NSB-NLON employees, as well as their dependents, have the use the golf course.

Golf fees are according to the following categories: E1-E6 (enlisted); E7 to O3; O4 and up; NSB-NLON employees, civilians/dependents of the military; guests; youths

Number of People within the Identified Exposure Group Involved in the Activity:

For the year 1990; March -236, April -1303; May -1955; June- 2303; July -2096; August -1866; Sept --1642; October -976; Nov- 499; Dec -230

Activity :

Playing the nine-hole golf course, occasionally reclaiming golf balls in the rough due to the narrow fairways; Possible contact with surface water and sediment in the streams.

a. Type of clothing worn during activity

Golf shirt, golf shoes, shorts or pants, maybe a jacket and a golf glove.

b. Time of year this type of activity occurs:

Greens are open from mid March to late December

Frequency:

During the golf season, golfers play three hours per event, with three events per week (over a six-month period)

Duration:

The average golfer plays approximately three hours of golf per round.

Period:

The length of membership to this golf course is equal to tour of duty.

Days of Week:

During the golf season, the golfers play approximately three days a week.

DEFENSE REUTILIZATION MARKETING OFFICE (DRMO)

Sources: Linda McCord, Bill Mansfield

Access to the area:

Restricted daily access; controlled gates; fence (south of the area) prevents access from Amberjack Road. Fence (north of area) deters trespassers from coming onto the base. To the west, area bounded by the Thames River, to the east by a railroad track.

Current Conditions:

The DRMO Buildings are constructed on concrete slabs with metal roofs

Current use of this area:

* daily visits to DRMO by state, federal agencies
* weekly deliveries by contractors
* weekly auctions
* monthly auctions
* sorting of scrap metal (employees)
* administrative duties performed by office personnel during the five-day work week
* storage in Building 355
* routine/repair maintenance of utilities.

Future use of this area:

To build a hazardous waste storage facility.
To extend the pavement to include the new hazardous waste storage facility

Does the condition of the area vary over the course of the year?

Prone to flooding during spring months (spring tide) and coastal storms.

DEFENSE REUTILIZATION MARKETING OFFICE (DRMO)

Human Health Exposure Assessment

CURRENT ACTIVITIES

Activity:

Sorting scrap metal into bins for recycling

Exposure Group:

Employees (adults)

Number of People within the Identified Exposure Group Involved in the Activity:

Seven

a. Type of clothing worn during activity (Gives the percentage of body exposure)

Workers may wear gloves to protect against abrasions and cuts,

b. Time of year activity occurs :

This activity occurs between January and May, and September to December.

Frequency:

Nine months of the year, five days/week. Remaining three months, workers maintain the golf course.

Duration:

Eight hours

Period:

Workers can be employed in this capacity between 25 and 35 years.

DEFENSE REUTILIZATION MARKETING OFFICE

Activity:

Daily visits to DRMO by state, federal agencies.

Exposure Group:

Governmental employees affiliated with state or federal agencies (22 to 62 yrs of age)

Number of People within the Identified Exposure Group Involved in the Activity:

Estimate ten people/hour (Linda McCord)

Activity:

Administrative duties, (not physical labor) associated with the government. Visitors to the office include some varying government officials,

a. Type of clothing worn during activity (gives the percentage of body exposure)

Business clothes

b. Time of year activity occurs:

Daily

Frequency:

Periodic or one-time visits depending on the individual.

Duration:

Varies depending on purpose of visit, from 30 minutes to one hour.

Period:

Possible one-time event, or over a number of years.

DEFENSE REUTILIZATION MARKETING OFFICE

Activity:

Weekly deliveries by contractors

Exposure Group:

Delivery people (18 to 50 yrs of age)

Number of People within the Identified Exposure Group Involved in the Activity:

Varies from day to day

Activity :

Delivery of office supplies, and commonly stocked items to office or scrap yard.

Time of year activity occurs:

Daily basis

Frequency:

Daily, weekly or monthly basis depending on delivery item.

Duration:

Average estimated time, is 15 to 30 minutes

Period:

Depending on the individual, possible one-time event or could occur over a number of years.

DEFENSE REUTILIZATION MARKETING OFFICE

Activity:

Monthly and weekly auctions

Exposure Group:

General public, adults and children.

Number of People Within the Identified Exposure Group Involved in the Activity :

Monthly: 250 people
Weekly: 50 people

Activity:

Auctioning discarded equipment

a. Type of clothing worn during activity (Gives the percentage of body exposure).

Depending on the time of year

b. Time of year activity occurs:

All year

Frequency:

Larger monthly auctions
Smaller weekly auctions

Duration :

Monthly auctions approximately four hours.
Weekly auctions approximately two hours.

Period :

Depending on the individual a possible one-time event, or something occuring over a number of years

DEFENSE REUTILIZATION MARKETING OFFICE

Activity:

Administrative duties performed by office personnel during the five day work week

Exposure Group:

Military Personnel (adults)

Number of People within the Identified Exposure Group Involved in the Activity :

Two

Activity:

Daily administrative office duties

b. Time of year activity occurs :

All year

Frequency:

Full-time position five days a week, 50 weeks a year

Duration :

Eight hour days

Period :

Workers may be in this capacity between 25 and 35 years

DEFENSE REUTILIZATION MARKETING OFFICE

Activity:

Routine maintenance of subgrade utilities

Exposure Group:

Naval public works people and utility repair people (adults)

Number of People within the Identified Exposure Group Involved in the Activity :

Five to Ten people

Time of year activity occurs :

All year

Frequency :

Refer to excavation table

Duration:

Eight hours

Period:

Naval public works employees, as well as outside utility repair people, usually employed in this capacity between 25 and 35 years.

DEFENSE REUTILIZATION MARKETING OFFICE

FUTURE ACTIVITIES

Activity:

Construction of hazardous waste storage facility

Exposed Group:

Private Contractors

Number of People within the Identified Exposure Group Involved in the Activity :

Depends on the type of construction

Activity:

Construction with several specifications to meet regulations for this type of RCRA facility

Time of year activity occurs:

Year round project, slated to take 18 months.

Frequency :

One-time event

Duration:

Eight hours daily

DEFENSE REUTILIZATION MARKETING OFFICE

Activity:

Installation of utilities

Exposure Group:

Military Personnel or public works people and outside utility repair people (adults)

Number of People within the Identified Exposure Group Involved in the Activity :

Five to Ten people

Time of year activity occurs:

Not specific

Frequency:

When needed

Duration :

Eight hours

Period:

Military public works employees, as well as outside utility repair people, are usually employed in this capacity for 25 to 35 years.

LOWER BASE

Sources:

Bill Mansfield, Joe Simmons

Access to the area:

High Security -restricted, daily access; controlled gates; a fence prevents access from Shark Boulivard to the piers. Area is bounded by the Thames River.

Current use of this area:

Authorized military.administrative staff, naval officers and enlisted workers or visitors to buildings:

BLDG 1 Commander Submarine Group 2,
BLDG 3 Commander Submarine Development Squadron 12,
BLDG 16 Lower Base Exchange and Cafeteria (Large number of transit activity)
BLDG 80 Commander Submarine Squadron 2
BLDG 87 Supply Department

* Daily pier activity includes access subs or berthing of submarines, fueling subs
* Routine/repair maintenance of steam, telephone, and condensate lines in trenches to buildings
* Routine inspection of trenches for leakage from 6 fuel lines
* Repack valves through manholes access points

Current conditions:

3% of manholes have oil contamination

Future use of this area: (interview with Joe Simmons)

* Removal of 4UST (E,H,G & 54) and installation of 1 new UST (completed)
* Removal of BLDG. 1,2,16 for a new squadron group 2 headquarters
* Demolition of BLDG.18, three feet below grade and 91
* Removal of BLDG. 70 near pier 12 for a new port control facility which includes silt building construction above flood plain
* Construction of new quay walls to replace deteriorating sheet pile bulkhead at piers 32 and 33,
* Dredging for berthing of SEAWOLF submarine at piers 32 and 33,
* Removal of BLDG 398 off of Aberjack RD
* Build out from existing quay wall at piers 15 and 17: nstall sinkholes behind existing bulkhead and perform maintenance dredging
* Perform maintenance dredging at piers 2,6, 31
* Remove UST H and replace with 30,000 gallon UST diesel fuel

Does condition of the area vary over the course of the year?

Prone to flooding due to coastal storms

LOWER BASE

Human Health Exposure Assessment

CURRENT ACTIVITIES

Activity:

Administrative duties

Exposure Group (approximate ages):

Authorized military administrative personnel and D.O.D. civilian employees (adults)

Number of People within the Identified Exposure Group Involved in the Activity :

300

Activity:

Working full-time in the buildings

Time of year activity occur:

All year round

Frequency:

Five days/week 50 weeks/year

Duration:

Eight hours

Period :

Employees are usually employed in this capacity for a maximium of 25 to 35 years

LOWER BASE

Activity:

Routine repair and maintenance of steam, telephone, and condensation in trench lines to buildings

Exposure Group

Navy public works employees and civilian utility repair people (adults)

Number of People within the Identified Exposure Group Involved in the Activity:

Five to Ten people

Activity :

Repairing on steam, telephone, and condensation trench lines to buildings

a. Type of clothing worn during activity (gives the percentage of body exposure)

Normal repair/ construction attire

b. Time of year activity occurs:

Year-round

Frequency :

Refer to excavation table

Duration :

Eight hours

Period :

Military public works employees as well as outside utility repair people are usually employed in this capacity 25 to 35 years

LOWER BASE

Activity:

Routine inspection of trenches for leakage from 6 fuel lines

Exposure Group

Navy public works employees

Number of people within the identified exposure group involved in the activity :

Five

Activity :

Accessing the trenches for leakage from 6 fuel lines

Type of clothing worn during activity

Normal repair/ construction attire

Frequency:

Once every 3 years

Duration :

Eight hours

Period :

Military public works employees are usually employed in this capacity for 25 to 35 years.

LOWER BASE

FUTURE ACTIVITIES

Activity:

Demolition or construction of buildings
Total construction estimate is approximately 18 months, 3-6 months for actual excavation of soil

Exposure Group

Outside Contractors

Number of People within the Identified Exposure Group Involved in the Activity :

Frequency :

One-time event, lasting 18 months

Duration :

Eight hour/day

LOWER BASE

Activity:

Dredging around Piers 15, 17, 32, and 33

Exposure Group:

Outside contractors (adults)

Number of People within the Identified Exposure Group Involved in the Activity :

A crew of five or six people involved in operation using clam shell bucket method

Activity :

Dredging around Piers 15, 17, 32, and 33

Loading dredge material on barges for ocean disposal.

Time of year activity occurs:

One-time event for private contractors

Frequency :

Months for each dredging operation

Duration :

Eight hours/day

LOWER BASE

Activity:

Reconstruction of existing quay walls for Piers 15, 17, 32, and 33

Exposure Group (approximate ages):

Outside contractors

Number of people within the identified exposure group involved in the activity :

???

Activity :

Removal of deteriorated sheet pile bulkhead, installing sinkholes behind existing bulkhead, construction of new quaywall

Type of clothing worn during activity:

Depending on degree of protection required.

Time of year activity occurs: one time event:

Year-round

Frequency :

One-time event; 18 months for quaywall restoration of each pier

Duration :

Eight hours/day : 5 days/week

SAMPLES USED FOR EXPOSURE SCENARIOS

AREA A LANDFILL EXPOSURE SCENARIOS

- Utility Worker Repairing Storm Sewers in Area A Landfill (Soil, Fugitive Dust)

Soil	2LMW7S	7-10
	2LMS8S	6-10
	2LMW9S	0-4
	2LMW9S	2-8
	2LTB2	2-8
	2LSS1	Surficial
	2LSS2	Surficial

- Weapons Center Personnel (Fugitive Dust)
- Military Servicemen Moving Palettes in Alpha Area Storage (Soil, Fugitive Dust)
- Military Servicemen Engaging in Nearby Recreational Activities (Fugitive Dust)
- Groton/Ledyard Residents (Fugitive Dust)

Soil	2LMW9S	0-4
	2LMW17S	0-2
	2LMW18S	0-2
	2LSS1	Surficial
	2LSS2	Surficial

- Citizens Attending Car Auctions in Deployed Parking (Soil, Fugitive Dust)

Soil	2LMW9S	0-4
	2LMW17S	0-2
	2LMW18S	0-2

AREA A DOWNSTREAM WATERCOURSES EXPOSURE SCENARIOS

- Subase Children Exploring Woods in Area A Wetland, Landfill and Downstream Watercourses (Soil, Fugitive Dust)

Soil	2LMW9S	0-4
	3MW12S	0-3
	2DMW15S	2-4
	2LSS1	Surficial
	2LSS2	Surficial

- Subase Children Exploring Area A Streambeds and Area A Wetland (Sediment)

Sediment	2DSD1	0 - 0.5
	2DSD2	0 - 0.5
	2DSD3	0 - 0.5
	2DSD4	0 - 0.5
	2DSD5	0 - 0.5
	2DSD7	0 - 0.5
	2DSD8	0 - 0.5
	2DSD9	0 - 0.5
	3SD1	0 - 0.5
	3SD2	0 - 0.5
	3SD3	0 - 0.5
	3SD4	0 - 0.5
	3SD5	0 - 0.5
	2WSD1	
	2WSD2	

- Subase Children Swimming in North Lake (Surface Water, Sediment)

Surface Water	AQUEOUS
	NAV90221
	NAV90118
	DN88116
	90-08-069
	2DSW10
Sand/Sediment	SAND
	NAV90222
	DN88118
	2DSD10

AREA A DOWNSTREAM WATERCOURSES EXPOSURE SCENARIOS

- Utility Worker Reparing Utility Lines in Area A Downstream Watercourses(Soil, Fugitive Dust, Ground

Groundwater	2DMW11S	
	2DMW16S	
	3MW12S	
Sediment	2DSD5	
	2DSD7	
	2DSD8	
	2DSD9	
	7SD1	
Soil	2DMW15S	2-4
	2DMW16S	2-4

DRMO EXPOSURES SCENARIOS

- Citizens Attending Monthly Public Auctions at DRMO (Soil, Fugitive Dust)
- Citizens Attending Weekly Public Sales at DRMO (Soil, Fugitive Dust)
- Department of Defense Workers Sorting Scrap Metal (Soil, Fugitive Dust)
- Ledyard Residents (Fugitive Dust)

Soil	6TB5	0-2
	6TB6	0-2
	6TB7	0-2
	6MW4S	0-2
	6SS1C	Surficial
	6SS2C	Surficial

- Utility Worker at DRMO Under Current Conditions (Soil, Fugitive Dust, Groundwater)

Groundwater	6MW1S	
	6MW2S	
Soil	6MW1S	0-2
	6MW1S	4-6
	6MW2S	0-2
	6MW2S	2-4
	6TB1	0-2
	6TB1	2-4
	6TB2	0-2
	6TB2	2-4
	6TB3	0-2
	6SS3C	Surficial
	6SS4C	Surficial

DRMO EXPOSURES SCENARIOS

- Utility Worker at DRMO Under Future Conditions (Soil, Fugitive Dust, Groundwater)
- Utility Worker at DRMO Under Future Conditions (Construction of Hazardous Waste Storage Facility) (Soil, Fugitive Dust, Groundwater)

Groundwater	6MW1S	
	6MW2S	
	6MW3S	
	6MW4S	
Soil	6SS1C	Surficial
	6SS2C	Surficial
	6SS3C	Surficial
	6SS4C	Surficial
	6MW1S	0-2
	6MW1S	4-6
	6MW2S	0-2
	6MW2S	2-4
	6MW3S	0-2
	6MW3S	2-4
	6MW4S	0-2
	6MW4S	2-4
	6TB1	0-2
	6TB1	2-4
	6TB2	0-2
	6TB2	2-4
	6TB3	0-2
	6TB3	6-8
	6TB4	0-2
	6TB4	6-8
	6TB5	0-2
	6TB5	2-6
	6TB6	0-2
	6TB6	2-4
	6TB7	0-2
	6TB7	2-4

- Subase Children (Fugitive Dust)

Soil	2LMW9S	0-4
	2LMW17S	0-2
	2LMW18S	0-2
	6MW4S	0-2
	6TB5	0-2
	6TB6	0-2
	6TB7	0-2
	2LSS1	Surficial
	2LSS2	Surficial
	6SS1C	Surficial
	6SS2C	Surficial

LOWER SUBASE EXPOSURE SCENARIOS

- Utility Workers in Lower Subase Vaults (Soil, Groundwater)

Groundwater	13MW1S	
	13MW2S	
	13MW3S	
	13MW4S	
	13MW5S	
	13MW6S	
	13MW7S	
	13MW8S	
	13MW9S	
	13MW10S	
	13MW11S	
	13MW12S	
	13MW13S	
	13MW14S	
	13MW15S	
	13MW16S	
	13MW17S	
	WEMW1S	
	WEMW4S	
	WEMW5S	
	NESOMW4S	
	NESOMW6S	
	NESOMW10S	
	NESO11	
Soil	13MW4	6-8
	13MW9	6-8
	13MW10	6-8
	13MW11	2-4

LOWER SUBASE EXPOSURE SCENARIOS

- Utility Worker in Lower Subase (Current Conditions) (Soil, Fugitive Dust, Groundwater)
- Utility Worker in Lower Subase (Future Construction of Buildings) (Soil, Fugitive Dust, Groundwater)

Groundwater	13MW1S	
	13MW2S	
	13MW3S	
	13MW4S	
	13MW5S	
	13MW6S	
	13MW7S	
	13MW8	
	13MW9S	
	13MW10S	
	13MW11S	
	13MW12S	
	13MW13S	
	13MW14S	
	13MW15S	
	13MW16S	
	13MW17S	
	WEMW1S	
	WEMW4S	
	WEMW5S	
	NESOMW4S	
	NESOMW6S	
	NESOMW10S	
	NESO11	
Soil	13MW1	12-14
	13MW2	10-12
	13MW3	12-14
	13MW4	6-8
	13MW5	10-12
	13MW6	14-16
	13MW7	8-10
	13MW8	8-10
	13MW9	6-8
	13MW10	6-8
	13MW11	2-4
	13MW12	8-10
	13MW13	8-10
	13MW14	12-14
	13MW15	12-14
	13MW16	10-12
	13MW17	8-10

FUGITIVE DUST EMISSION RATE MODELING

Dust Model for Wind Erosion
Cowherd, et al. (1985)

Source: Area A Landfill
Receptor: Subase Residents

Model Inputs		**Units**
Fraction of area with vegetation	0	unitless
Mean annual wind speed	5.4	m/s
Roughness height	4	cm
Area of erosion surface	22,259	sq m

Site-Estimated Values		
Friction velocity	0.35	m/s

Intermediate Calculations		
Erosion threshold wind speed @ 7 m	4.52	m/s
x, argument of erosion function	0.74	unitless

Intermediate Erosion Function, F(x)
Calculated F(x)
See Figure 4-3 of Cowherd

Result of Figure 4-3 Look-up
1.8

F(x)
1.8

Results		
PM10 emissions factor:	1.11E-01	g/m2-hr
PM10 emissions rate:	6.84E+05	ug/sec

Dust Model for Wind Erosion
Cowherd, et al. (1985)

Source: Area A Landfill
Receptor: Residents along Route 12

Model Inputs		**Units**
Fraction of area with vegetation	0	unitless
Mean annual wind speed	5.69	m/s
Roughness height	4	cm
Area of erosion surface	22,259	sq m

Site-Estimated Values		
Friction velocity	0.35	m/s

Intermediate Calculations		
Erosion threshold wind speed @ 7 m	4.52	m/s
x, argument of erosion function	0.70	unitless

Intermediate Erosion Function, F(x)
Calculated F(x)
See Figure 4-3 of Cowherd

Result of Figure 4-3 Look-up
1.83

F(x)
1.83

Results		
PM10 emissions factor:	1.31E-01	g/m2-hr
PM10 emissions rate:	8.13E+05	ug/sec

Sector Averaged Model - Zero Stack Height
Hanna, et al. (1982)

Source: Area A Landfill
Receptor: Residents along Route 12

Input Parameters		**Units**
Fraction of time wind blown toward sector	0.0673	-
Erosional flux of soil	8.13E+05	ug soil/sec
Mean wind speed	5.69	m/sec
Distance from source to receptor	425	m
Intermediate Calculations		
Standard deviation of crosswind conc. *	11.31	m

Results		
Downwind PM10 concentration in sector	4.07	ug source PM10/m3

* Assumes most conservative crosswind distribution

Sector Averaged Model - Zero Stack Height
Hanna, et al. (1982)

Source: Area A Landfill
Receptor: Subase Residents

Input Parameters		**Units**
Fraction of time wind blown toward sector	0.0947	-
Erosional flux of soil	6.84E+05	ug soil/sec
Mean wind speed	5.4	m/sec
Distance from source to receptor	490	m
Intermediate Calculations		
Standard deviation of crosswind conc. *	12.82	m

Results		
Downwind PM10 concentration in sector	3.88	ug source PM10/m3

* Assumes most conservative crosswind distribution

Sector Averaged Model - Zero Stack Height
Hanna, et al. (1982)

Source: Area A Landfill
Receptor: Weapons Center

Input Parameters		**Units**
Fraction of time wind blown toward sector	0.0616	-
Erosional flux of soil	9.87E+05	ug soil/sec
Mean wind speed	6.16	m/sec
Distance from source to receptor	240	m
Intermediate Calculations		
Standard deviation of crosswind conc. *	12.35	m

Results		
Downwind PM10 concentration in sector	6.76	ug source PM10/m3

* Assumes most conservative crosswind distribution

Sector Averaged Model - Zero Stack Height
Hanna, et al. (1982)

Source: DRMO
Receptor: Trailer Park Residents

Input Parameters		**Units**
Fraction of time wind blown toward sector	0.1037	-
Erosional flux of soil	1.03E+05	ug soil/sec
Mean wind speed	5.47	m/sec
Distance from source to receptor	485	m
Intermediate Calculations		
Standard deviation of crosswind conc. *	12.70	m

Results		
Downwind PM10 concentration in sector	0.64	ug source PM10/m3

* Assumes most conservative crosswind distribution

Sector Averaged Model - Zero Stack Height
Hanna, et al. (1982)

Source: DRMO
Receptor: Subase Residents

Input Parameters		**Units**
Fraction of time wind blown toward sector	0.0513	-
Erosional flux of soil	6.06E+04	ug soil/sec
Mean wind speed	4.65	m/sec
Distance from source to receptor	915	m
Intermediate Calculations		
Standard deviation of crosswind conc. *	21.54	m

Results		
Downwind PM10 concentration in sector	0.07	ug source PM10/m3

* Assumes most conservative crosswind distribution

Dust Model for Wind Erosion
Cowherd, et al. (1985)

Source: DRMO
Receptor: Subase Residents

Model Inputs		**Units**
Fraction of area with vegetation	0	unitless
Mean annual wind speed	4.65	m/s
Roughness height	4	cm
Area of erosion surface	3,181	sq m

Site-Estimated Values

Friction velocity	0.35	m/s

Intermediate Calculations

Erosion threshold wind speed @ 7 m	4.52	m/s
x, argument of erosion function	0.86	unitless

Intermediate Erosion Function, F(x)
Calculated F(x)
See Figure 4-3 of Cowherd

Result of Figure 4-3 Look-up
1.75

F(x)
1.75

Results

PM10 emissions factor:	6.86E-02	g/m2-hr
PM10 emissions rate:	6.06E+04	ug/sec

Dust Model for Wind Erosion
Cowherd, et al. (1985)

Source: DRMO
Receptor: Trailer Park Residents

Model Inputs		**Units**
Fraction of area with vegetation	0	unitless
Mean annual wind speed	5.47	m/s
Roughness height	4	cm
Area of erosion surface	3,181	sq m

Site-Estimated Values		
Friction velocity	0.35	m/s

Intermediate Calculations		
Erosion threshold wind speed @ 7 m	4.52	m/s
x, argument of erosion function	0.73	unitless

Intermediate Erosion Function, F(x)
Calculated F(x)
See Figure 4-3 of Cowherd

Result of Figure 4-3 Look-up
1.82

F(x)
1.82

Results		
PM10 emissions factor:	1.16E-01	g/m2-hr
PM10 emissions rate:	1.03E+05	ug/sec

Dust Model for Wind Erosion
Cowherd, et al. (1985)

Source: DRMO
Receptor: Subase Residents

Model Inputs		**Units**
Fraction of area with vegetation	0	unitless
Mean annual wind speed	4.65	m/s
Roughness height	4	cm
Area of erosion surface	3,181	sq m

Site-Estimated Values

Friction velocity	0.35	m/s

Intermediate Calculations

Erosion threshold wind speed @ 7 m	4.52	m/s
x, argument of erosion function	0.86	unitless

Intermediate Erosion Function, F(x)
Calculated F(x)
See Figure 4-3 of Cowherd

Result of Figure 4-3 Look-up
1.75

F(x)
1.75

Results

PM10 emissions factor:	6.86E-02	g/m2-hr
PM10 emissions rate:	6.06E+04	ug/sec

UTILITY REPAIR DATA

Utility Work/Excavation Occuring on NSB-NLON

	Building or Location	Activity	Date Completed	Number of Manhours
Utility work		watermain break	Nov-90	70
		repair hydrant	Feb-90	32
		repair hydrant	Jun-90	56
		replace hydrant	Feb-90	52
	119	repair water feed to BLD	Jan-90	114
	429	watermain break	Mar-90	54
	85	repair hydrant	Nov-89	214
		replace sewer pipe	Mar-90	72
		replace sewer line	Mar-90	101
	379	repair sewage leak	Mar-90	70
	446	repair sewer cleanout	Feb-91	32
Steam condensate repair		replace condensate line 428	Nov-90	52
		install temporary condensate	Jan-91	259
		replace condensate line	Jan-90	114
		repair condensate leak	Oct-90	62
	108	repair condensate line	Nov-90	36
	152	replace condensate line	Jul-90	91
	465	install condensate drain	Mar-90	18
	77	repair condensate leak	Aug-90	223
	341	hookup utilities to trailer	Feb-90	336
	428	repair underground gas leak	Oct-89	70
storm drain system repair		repair manhole C-538	Feb-90	55
		repair manhole	Feb-90	36
		repair storm drain	Apr-90	48
		repair potholes	May-90	56
		repair storm drain	May-90	32
		repair washout gate 6	Jun-90	28

Utility Work/Excavation Occuring on NSB-NLON

	Building or Location	Activity	Date Completed	Number of Manhours
		repair storm drain #738	Mar-90	36
		repair storm drain	Mar-90	49
	435	repair drainage ditch	Feb-91	94
Miscellaneous		remove trailers	Mar-90	132
		repair cross walks	Feb-91	?
		run new service	Dec-90	755
	roads	repair undermining (roads)	May-90	40
	roads	replace curb box (roads)	May-90	8
	roads	remove curbing	Aug-90	16
	roads	fab and install pipe guard	Dec-90	236
	roads	pack pot holes	Sep-90	8
		replace oil tank 34 cavalla	Nov-89	88
		dig out fuel tank ch 901	Nov-90	1.5
	BLG426	replace lawn with sod after contractors	Nov-90	1
	485	remove shrubs	Nov-89	60
	street lights	repair	Feb-90	66
	street lights	repair	Mar-90	48
	street lights	repair	Oct-90	72
		pour concrete slab	May-90	33
	462	install antenna north bldg	May-90	71

Utility Work/Excavation Occuring on NSB-NLON

	Building or Location	Activity	Date Completed	Number of Manhours
DRMO Area		replace oil tanks	Sep-90	26
		dig up fuel lines	Sep-90	2
L wer Base	106	replace 2 H/W/lines	Nov-89	56
	106	repair base hot/w line	Nov-90	24
	106	replace condensate pipe	Jun-90	94
	29	install steel strips	Dec-89	34
	85	repair fire hydrant	Nov-89	214
	Pier-1	install trap stations	Feb-91	107
	Pier-10	remove installation	Mar-90	8
	Pier-10	repair water main	Mar-90	54
	Pier-10	manhole cover coming off	Oct-90	0.5
	Pier-13	Repair air line	Jan-91	38
	Pier 2	relocate backflow preventers	Nov-90	192
	Pier 2	cover utility pipes	Jul-90	24
	all piers	replace missing steel plates	Feb-90	228
	all piers	replace dirt with gravel	Feb-90	64
	pier u	repair pot holes in roadway	Oct-90	2
	trenches	replace broken trench coversion	Jun-90	192
	trenches	replace trench covers	Dec-90	204
	trenches	reroute sump pump	May-90	91
	trenches	replace 14" pipe	Dec-90	160
	trenches	replace condensate line near 484	Sep-90	1.5
	trenches	oil spill No. 6	Nov-90	2
Area A	450	Connect grounding grid	Jun-90	177
includes wetlands, North Lake,	quarters A	landscape	Nov-90	80
Torp do shops, Weapon Bunkers	quarters A	landscape backyard	May-90	22
and landfill	quarters A	weed & thin growth	Jul-90	24

Utility Work/Excavation Occuring on NSB-NLON

	Building or Location	Activity	Date Completed	Number of Manhours
	weapons	provide power to trailer	Feb-90	36
	weapons	install grounding grid	Jun-90	124

Total for the Entire Base = **6478.50** manhours/1.5 years

F r Naval Labor force of 42 individuals = **102.83** hours/man/year

Area f Site	Percentage of Utility lines Compared to The Entire Base	Estimate of Hours Spent per Naval Laborer in the site During the Year
DRMO	5.00%	5.14 hours/year/man
L wer Subase	25.00%	25.71
Area A Downstream Watercourses	5.00%	5.14
Area A Landfill	1.00%	1.03

NOTE: Statistics were provided through a retrieval from a Computer Database accessed by Robert Lee, Naval Public Works Department. Data anager. Estimate of the percentage of Utility Lines within a site was made based on inspection of NSB- LON maps

APPENDIX F

ECOLOGICAL RISK ASSESSMENT DATA

APPENDIX F-1
AREA A SPECIES LISTS

GROTON - AREA A: BIRD SPECIES LIST, 1990

Green-backed Heron	*Butorides striatus*
Mallard	*Anas platyrhynchos*
Turkey Vulture	*Cathartes aura*
Osprey	*Pandion haliaetus*
Red-tailed Hawk	*Buteo jamaicensis*
Northern Bobwhite	*Colinus virginianus*
Mourning Dove	*Zenaida macroura*
Chimney Swift	*Chaetura pelagica*
Red-bellied Woodpecker	*Melanerpes carolinus*
Downy Woodpecker	*Picoides pubescens*
Northern Flicker	*Colaptes auratus*
Least Flycatcher	*Empidonax minimus*
Eastern Phoebe	*Sayornis phoebe*
Eastern Kingbird	*Tyrannus tyrannus*
Tree Swallow	*Tachycineta bicolor*
Barn Swallow	*Hirundo rustica*
Blue Jay	*Cyanocitta cristata*
American Crow	*Corvus brachyrhynchos*
Black-capped Chickadee	*Parus atricapillus*
Tufted Titmouse	*Parus bicolor*
Carolina Wren	*Thryothorus ludovicianus*
Golden-crowned Kinglet	*Regulus satrapa*
Ruby-crowned Kinglet	*Regulus calendula*
Hermit Thrush	*Catharus guttatus*
Wood Thrush	*Hylocichla mustelina*
American Robin	*Turdus migratorius*
Gray Catbird	*Dumetella carolinensis*
Northern Mockingbird	*Mimus polyglottos*
Cedar Waxwing	*Bombycilla cedrorum*
European Starling	*Sturnus vulgaris*
Warbling Vireo	*Vireo gilvus*
Red-eyed Vireo	*Vireo olivaceus*
Blue-winged Warbler	*Vermivora pinus*
Tennessee Warbler	*Vermivora peregrina*
Yellow Warbler	*Dendroica petechia*
Magnolia Warbler	*Dendroica magnolia*
Yellow-rumped Warbler	*Dendroica coronata*
Prairie Warbler	*Dendroica discolor*
American Redstart	*Setophaga ruticilla*
Ovenbird	*Seiurus aurocapillus*
Northern Waterthrush	*Seiurus noveboracensis*
Mourning Warbler	*Oporornis philadelphia*
Common Yellowthroat	*Geothlypis trichas*
Yellow-breasted Chat	*Icteria virens*
Scarlet Tanager	*Piranga olivacea*
Northern Cardinal	*Cardinalis cardinalis*

Rose-breasted Grosbeak	*Pheucticus ludovicianus*
Indigo Bunting	*Passerina cyanea*
Chipping Sparrow	*Spizella passerina*
Field Sparrow	*Spizella pusilla*
Song Sparrow	*Melospiza melodia*
Swamp Sparrow	*Melospiza georgiana*
White-throated Sparrow	*Zonotrichia albicollis*
Dark-eyed Junco	*Junco hyemalis*
Bobolink	*Dolichonyx oryzivorus*
Red-winged Blackbird	*Agelaius phoeniceus*
Common Grackle	*Quiscalus quiscula*
Brown-headed Cowbird	*Molothrus ater*
Northern Oriole	*Icterus galbula*
House Finch	*Carpodacus mexicanus*
American Goldfinch	*Carduelis tristis*
House Sparrow	*Passer domesticus*

GROTON - AREA A: MAMMAL, REPTILE, AMPHIBIAN LIST, 1990

Opossum	*Didelphis virginiana*
Woodchuck	*Marmota monax*
Raccoon	*Procyon lotor*
Eastern Cottontail	*Sylvilagus floridanus*
White Tail Deer	*Odocoileus virginianus*
White Footed Mouse	*Peromyscus leucopus*
Striped Skunk	*Mephitis mephitis*
Eastern Gray Squirrel	*Sciurus carolinensis*
Bat	*Chiroptera* sp.
Green Frog	*Rana clamitans melanota*
Spring Peeper	*Hyla crucifer*
Leopard Frog	*Rana pipiens*
Painted Turtle	*Chrysemys picta*

GROTON - AREA A: VEGETATION TYPES, 1990

Herbaceous Wetland (HF1 and HF2)

HF1

Marsh Reed	*Phragmites* sp.

HF2

Marsh Reed	*Phragmites* sp.

Upland Deciduous Forest (DF1, DF2, DF3, DF4)

DF1

Red/Black Oak	*Quercus* sp.
Black Birch	*Betula lenta*
Red Maple	*Acer rubrum*
Beech	*Fagus grandifolia*
Witch Hazel	*Hamamelis virginiana*
Mountain Laurel	*Kalmia latifolia*
Sweet Pepperbush	*Clethra* sp.
Bayberry	*Myrica* sp.

DF2

Red/Black Oak	*Quercus* sp.
Black Birch	*Betula lenta*
Red Maple	*Acer rubrum*
Gray Birch	*Betula populifolia*
White Oak	*Quercus alba*
Mountain Laurel	*Kalmia latifolia*
American Bittersweet	*Celastrus scandens*
Sweet Pepperbush	*Clethra* sp.

DF3

Black Cherry	*Prunus serotina*
Black Birch	*Betula lenta*
Red Maple	*Acer rubrum*
Gray Birch	*Betula populifolia*
Staghorn Sumac	*Rhus typhina*
Multiflora Rose	*Rosa multiflora*
American Bittersweet	*Celastrus scandens*
Blackberry	*Rubus* sp.

DF4

Red/Black Oak	*Quercus* sp.
Black Birch	*Betula lenta*
Red Maple	*Acer rubrum*
Mockernut Hickory	*Carya tomentosa*
Sassafras	*Sassafras albidum*
Mountain Laurel	*Kalmia latifolia*
Witch Hazel	*Hamamelis virginiana*

Upland Coniferous/Deciduous Forest (C/DF1, C/DF2)

C/DF1

Red/Black Oak	*Quercus* sp.
Eastern Hemlock	*Tsuga canadensis*
White Oak	*Quercus alba*
Black Birch	*Betula lenta*
Mockernut Hickory	*Carya tomentosa*
Mountain Laurel	*Kalmia latifolia*
MapleLeaf Viburnum	*Viburnum acerifolium*
Sassafras	*Sassafras albidum*

C/DF2

Red/Black Oak	*Quercus* sp.
Yellow Birch	*Betula lutea*
Mockernut Hickory	*Carya tomentosa*
White Oak	*Quercus alba*
Eastern Hemlock	*Tsuga canadensis*
Common Spicebush	*Lindera benzoin*
Mapleleaf Viburnum	*Vibernum acerifolium*
Mountain Laurel	*Kalmia latifolia*

Upland Shrub (US)

US

Quaking Aspen	*Populus tremuloides*
Staghorn Sumac	*Rhus typhina*
Autumn Olive	*Elaeagnus umbellata*
Multiflora Rose	*Rosa multiflora*
American Bittersweet	*Celastrus scandens*

Upland Deciduous Forest/Shrub (DF/S1, DF/S2, DF/S3)

DF/S1

Black Birch	*Betula lenta*
Black Cherry	*Prunus serotina*
Red Maple	*Acer rubrum*
Gray Birch	*Betula populifolia*

Red Cedar	*Juniperus virginiana*
Blackberry	*Rubus* sp.
American Bittersweet	*Celastrus scandens*
Multiflora Rose	*Rosa multiflora*

DF/S2

Quaking Aspen	*Populus tremuloides*
American Bittersweet	*Celastrus scandens*
Wild Grape	*Vitis* sp.
Autumn Olive	*Elaeagnus umbellata*
Staghorn Sumac	*Rhus typhina*
Multiflora Rose	*Rosa multiflora*

DF/S3

Quaking Aspen	*Populus tremuloides*
Multiflora Rose	*Rosa multiflora*
American Bittersweet	*Celastrus scandens*
Autumn Olive	*Elaeagnus umbellata*
Willow	*Salix* sp.
Red Cedar	*Juniperus virginiana*

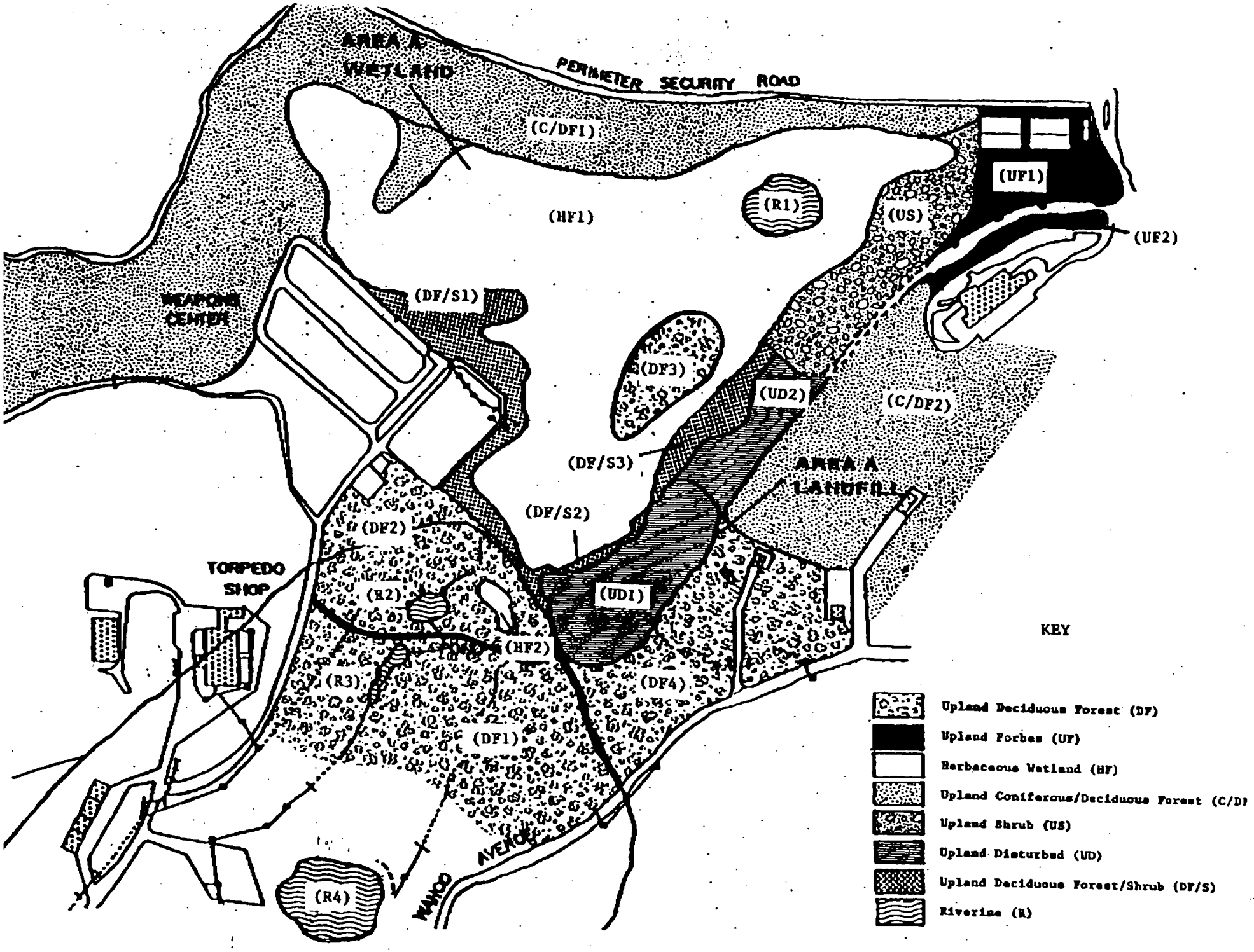
Upland Forbes (UF1, UF2)

UF1

Forbes	*Graminaceae* sp.

UF2

Forbes	*Graminaceae* sp.


AREA A WETLAND
PERIMETER SECURITY ROAD
(C/DF1)
(HF1)
(R1)
(UF1)
(US)
(UF2)
WEAPONS CENTER
(DF/S1)
(DF3)
(UD2)
(C/DF2)
(DF/S3)
AREA A LANDFILL
(DF/S2)
(DF2)
TORPEDO SHOP
(R2)
(UD1)
(HF2)
(R3)
(DF4)
(DF1)
(R4)
WAHOO AVENUE
KEY
Upland Deciduous Forest (DF)
Upland Forbes (UF)
Herbaceous Wetland (HF)
Upland Coniferous/Deciduous Forest (C/DF)
Upland Shrub (US)
Upland Disturbed (UD)
Upland Deciduous Forest/Shrub (DF/S)
Riverine (R)

APPENDIX F-2
AREA A SOIL AND SEDIMENT DATA SUMMARIES

SURFACE SOIL DATA SUMMARY
AREA A WETLANDS

SAMPLE ID:	2WMW5S	2WMW6S	2WTB2	2WTB4	2WTB6	2WTB7	2WTB8	2WSD1	2WSD2	2WSD3
DEPTH (ft):	0-2	2-4	0-2	0-2	0-2	0-2	1-3			
VOLATILE ORGANIC COMPOUNDS										
Nonchlorinated Aromatics										
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene										
Toluene										
Xylene (total)										
Chlorinated Compounds										
Chloromethane										
1,1-Dichloroethane										
1,2-Dichloroethane										
1,1-Dichloroethene										
1,2-Dichloroethene (total)										
Methylene Chloride	ND	ND	ND	ND	ND	ND	4	ND	ND	ND
Tetrachloroethane										
Tetrachloroethene	3	3	ND	ND	ND	ND	7	ND	ND	ND
Trichloroethene	ND	ND	ND	4	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane										
1,1,2-Trichloroethane										
Vinyl Chloride										
Other VOCs										
Acetone	ND	74	ND	ND	540	ND	850	210	130	230
2-Butanone	ND	ND	ND	ND	87	ND	310	140	100	ND
4-Methyl-2-Pentanone										
Carbon Disulfide	ND	15	ND	ND	6	ND	8	11	16	18
SEMIVOLATILE COMPOUNDS										
Noncarcinogenic PAHs										
Acenaphthene										
Acenaphthylene	ND	ND	ND	77	ND	ND	120			
Anthracene	ND	ND	ND	52	ND	ND	79	ND	ND	ND

SURFACE SOIL DATA SUMMARY
AREA A WETLANDS

SAMPLE ID:	**2WMW5S**	**2WMW6S**	**2WTB2**	**2WTB4**	**2WTB6**	**2WTB7**	**2WTB8**	**2WSD1**	**2WSD2**	**2WSD3**
DEPTH (ft):	**0-2**	**2-4**	**0-2**	**0-2**	**0-2**	**0-2**	**1-3**			
Fluoranthene	180	460	460	310	300	72	600	970	ND	390
Fluoren								ND	ND	ND
2-Methylnaphthalene										
Naphthalene										
Phenanthrene	130	ND	ND	270	160	ND	340	ND	ND	ND
Pyrene	320	360	380	460	270	98	570	1300	ND	670
Carcinogenic PAHs										
Benzo(a)Anthracene	160	370	400	220	200	ND	370	670	ND	ND
Benzo(a)Pyrene	ND	ND	ND	230	190	ND	390	ND	ND	ND
Benzo(b)Fluoranthene	180	ND	ND	220	210	ND	550	380	ND	ND
Benzo(g,h,i)Perylene								ND	ND	ND
Benzo(k)Fluoranthene	120	ND	ND	310	250	ND	390	480	ND	ND
Chrysene	230	330	ND	320	250	ND	600	630	ND	ND
Dibenz(a,h)Anthracene										
Indeno(1,2,3-cd)Pyrene	ND	ND	ND	ND	ND	ND	270	ND	ND	ND
Total PAHs	*2351.24*	*3324.67*	*3302.48*	*2726.81*	*2603.4*	*2490.29*	*4279*	*5976.86*	*3093.72*	*3638.1*
Other Semi-Volatile Compounds										
bis(2-Ethylhexyl)Phthalate	790	ND	ND	280	350	ND	1300			
Di-n-Butylphthalate										
2,4-Dimethylphenol										
4,6-Dinitro-2-methylphenol										
2-Methylphenol										
4-Methylphenol										
Phenol										
Benzoic Acid	ND	ND	ND	160	130	ND	ND	ND	ND	ND
4-Chloroaniline										
Dibenzofuran								ND	ND	ND
2-Nitroaniline										
N-Nitrosodiphenylamine (1)										

SURFACE SOIL DATA SUMMARY
AREA A WETLANDS

SAMPLE ID:	2WMW5S	2WMW6S	2WTB2	2WTB4	2WTB6	2WTB7	2WTB8	2WSD1	2WSD2	2WSD3
DEPTH (ft):	0-2	2-4	0-2	0-2	0-2	0-2	1-3			
PESTICIDES										
4,4' DDE	ND	ND	ND	32	ND	ND	ND	36	40	ND
4,4' DDD	ND	ND	ND	ND	69	ND	ND	140	ND	ND
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	ND	57
Total DDT Residues	*37.5*	*37.5*	*37.5*	*57*	*94*	*37.5*	*37.5*	*188.5*	*65*	*82*
Beta-BHC										
Endrin										
Endrin Ketone										
Methoxychlor										
PCBs										
Aroclor 1260	ND	ND	370	ND	ND	ND	ND			
Aroclor 1254										
INORGANICS										
Metals										
Aluminum	11200	14100	14100	15300	16800	13900	17900	18900	22200	18800
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	7	7.7	6.7	8.7	8.4	7.2	6.8	9.2	9.5	9.5
Beryllium	1.2	0.57	1.8	ND	0.73	1.5	1.8	0.91	1.1	0.88
Boron	530	703	1600	672	563	170	330	4100	4000	4400
Cadmium	4.7	4.5	6.9	ND	1.9	4.5	6.7	4.2	4.8	5.3
Copper	38.5	31.1	20.2	47.6	64.1	35.4	55	33	30.5	69.5
Iron	21500	28000	27200	30800	27100	20200	27900	28100	31700	29700
Lead	38.5	298	11.2	128	44	49.5	83.7	51	21.3	46.1
Manganese	160	176	306	188	202	189	233	352	365	341
Mercury	0.22	0.41	ND	0.69	ND	0.38	0.67	ND	ND	0.31
Nickel	14.7	16.1	25.9	16.7	20.2	16.8	26.9	26	28.2	27
Selenium	0.7	0.7	ND	1.2	1.5	ND	0.93	0.89	1.6	1.3
Zinc	54.6	59.7	75.5	60.8	74.9	59.5	62.9	90.6	126	127

SURFACE SOIL DATA SUMMARY
AREA A WETLANDS

SAMPLE ID:	**2WSD4**	**2WSD5**	**2WSD6**	**2WSD7**	**2WSD8**	**2WSD9**
DEPTH (ft):						
VOLATILE ORGANIC COMPOUNDS						
Nonchlorinated Aromatics						
Benzene	ND	ND	ND	ND	ND	ND
Ethylbenzene						
Toluene						
Xylene (total)						
Chlorinated Compounds						
Chloromethane						
1,1-Dichloroethane						
1,2-Dichloroethane						
1,1-Dichloroethene						
1,2-Dichloroethene (total)						
Methylene Chloride	10	3	10	ND	2	5
Tetrachloroethane						
Tetrachloroethene	16	4	10	ND	ND	11
Trichloroethene	11	3	ND	ND	ND	6
1,1,1-Trichloroethane						
1,1,2-Trichloroethane						
Vinyl Chloride						
Other VOCs						
Acetone	ND	ND	240	720	190	ND
2-Butanone	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone						
Carbon Disulfide	ND	ND	9	ND	15	ND
SEMIVOLATILE COMPOUNDS						
Noncarcinogenic PAHs						
Acenaphthene						
Acenaphthylene						
Anthracene	ND	ND	ND	ND	ND	2400

SURFACE SOIL DATA SUMMARY
AREA A WETLANDS

SAMPLE ID:	**2WSD4**	**2WSD5**	**2WSD6**	**2WSD7**	**2WSD8**	**2WSD9**
DEPTH (ft):						
Fluoranthene	410	ND	ND	470	1300	80000
Flu rene	ND	ND	ND	ND	ND	1000
2-Methylnaphthalene						
Naphthalene						
Phenanthrene	ND	ND	ND	ND	440	36000
Pyrene	460	ND	470	610	1500	42000
Carcinogenic PAHs						
Benzo(a)Anthracene	ND	ND	ND	ND	ND	27000
Benzo(a)Pyrene	ND	ND	ND	ND	ND	35000
Benzo(b)Fluoranthene	ND	ND	ND	ND	420	55000
Benzo(g,h,i)Perylene	ND	ND	ND	ND	ND	23000
Benzo(k)Fluoranthene	ND	ND	ND	ND	670	45000
Chrysene	ND	ND	ND	ND	610	42000
Dibenz(a,h)Anthracene						
Indeno(1,2,3-cd)Pyrene	ND	ND	ND	ND	ND	23000
Total PAHs	*3448.1*	*3093.72*	*3305.91*	*3658.1*	*6486.86*	*411400*
Other Semi-Volatile Compounds						
bis(2-Ethylhexyl)Phthalate						
Di-n-Butylphthalate						
2,4-Dimethylphenol						
4,6-Dinitro-2-methylphenol						
2-Methylphenol						
4-Methylphenol						
Phenol						
Benzoic Acid	ND	ND	ND	780	ND	ND
4-Chloroaniline						
Dibenzofuran	ND	ND	ND	ND	ND	1000
2-Nitroaniline						
N-Nitrosodiphenylamine (1)						

SURFACE SOIL DATA SUMMARY
AREA A WETLANDS

SAMPLE ID:	**2WSD4**	**2WSD5**	**2WSD6**	**2WSD7**	**2WSD8**	**2WSD9**
DEPTH (ft):						
PESTICIDES						
4,4' DDE	ND	ND	ND	ND	ND	ND
4,4' DDD	ND	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND	ND	ND
Total DDT Residues	*37.5*	*37.5*	*37.5*	*37.5*	*37.5*	*37.5*
Beta-BHC						
Endrin						
Endrin Ketone						
Methoxychlor						
PCBs						
Aroclor 1260						
Aroclor 1254						
INORGANICS						
Metals						
Aluminum	16600	14200	19300	17800	18300	20800
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	10	8.5	10.5	13.9	8.1	11.8
Beryllium	0.44	0.39	0.81	0.51	0.84	0.85
Boron	1200	1300	730	450	3600	490
Cadmium	3.8	3.7	3.5	3.5	5	6.1
Copper	44.8	52.2	51.3	34.6	71.5	39.6
Iron	26700	28300	22900	24100	25500	44000
Lead	56.8	48.1	69	37.8	69.2	241
Manganese	193	166	210	193	278	357
Mercury	0.25	0.35	0.32	0.42	0.48	0.24
Nickel	17.8	16.7	19.9	17.6	24.2	21.2
Selenium	0.79	0.98	1.1	1.6	1.2	1.3
Zinc	63.2	58.1	57.6	51.5	124	109

SURFACE SOIL DATA SUMMARY AREA A WETLANDS SAMPLE ID: DEPTH (ft):	Number Analyzed	Number Detected	Minimum	Maximum	Average
VOLATILE ORGANIC COMPOUNDS					
Nonchlorinated Aromatics					
Benzene	16	0			
Ethylbenzene					
Toluene					
Xylene (total)					
Chlorinated Compounds					
Chloromethane					
1,1-Dichloroethane					
1,2-Dichloroethane					
1,1-Dichloroethene					
1,2-Dichloroethene (total)					
Methylene Chloride	16	6	2	10	4.57
Tetrachloroethane					
Tetrachloroethene	16	7	3	16	5.57
Trichloroethene	16	4	3	11	4.43
1,1,1-Trichloroethane					
1,1,2-Trichloroethane					
Vinyl Chloride					
Other VOCs					
Acetone	16	9	74	850	202.42
2-Butanone	16	4	87	310	45.67
4-Methyl-2-Pentanone					
Carbon Disulfide	16	8	6	18	8.08
SEMIVOLATILE COMPOUNDS					
Noncarcinogenic PAHs					
Acenaphthene					
Acenaphthylene	7	2	77	120	212.29
Anthracene	16	3	52	2400	367.66

SURFACE SOIL DATA SUMMARY AREA A WETLANDS SAMPLE ID: DEPTH (ft):	Number Analyzed	Number Detected	Minimum	Maximum	Average
Fluoranthene	16	13	72	80000	5418.46
Fluoren	9	1	1000	1000	340.28
2-Methylnaphthalene					
Naphthalene					
Phenanthrene	16	6	130	36000	2494.88
Pyrene	16	14	98	42000	3123.98
Carcinogenic PAHs					
Benzo(a)Anthracene	16	8	160	27000	1965.78
Benzo(a)Pyrene	16	4	190	35000	2431.48
Benzo(b)Fluoranthene	16	7	180	55000	3705.02
Benzo(g,h,i)Perylene	9	1	23000	23000	2784.72
Benzo(k)Fluoranthene	16	7	120	45000	3096.27
Chrysene	16	8	230	42000	2939.53
Dibenz(a,h)Anthracene					
Indeno(1,2,3-cd)Pyrene	16	2	270	23000	1679.96
Total PAHs				*411520*	*30560.326*
Other Semi-Volatile Compounds					
bis(2-Ethylhexyl)Phthalate	7	4	280	1300	499.06
Di-n-Butylphthalate					
2,4-Dimethylphenol					
4,6-Dinitro-2-methylphenol					
2-Methylphenol					
4-Methylphenol					
Phenol					
Benzoic Acid	16	3	130	780	1082.50
4-Chloroaniline					
Dibenzofuran	9	1	1000	1000	340.28
2-Nitroaniline					
N-Nitrosodiphenylamine (1)					

SURFACE SOIL DATA SUMMARY AREA A WETLANDS SAMPLE ID: DEPTH (ft):	Number Analyzed	Number Detected	Minimum	Maximum	Average
PESTICIDES					
4,4' DDE	16	3	32	40	16.91
4,4' DDD	16	2	69	140	24.00
4,4'-DDT	16	1	57	57	15.28
Total DDT Residues				*237*	*56.1875*
Beta-BHC					
Endrin					
Endrin Ketone					
Methoxychlor					
PCBs					
Aroclor 1260	7	1	370	370	160.00
Aroclor 1254					
INORGANICS					
Metals					
Aluminum	16	16	11200	22200	16887.50
Antimony	16	0			
Arsenic	16	16	6.7	13.9	8.97
Beryllium	16	15	0.39	1.8	0.93
Boron	16	16	170	4400	1552.38
Cadmium	16	15	1.9	6.9	4.35
Copper	16	16	20.2	71.5	44.93
Iron	16	16	20200	44000	27731.25
Lead	16	16	11.2	298	80.83
Manganese	16	16	160	365	244.31
Mercury	16	12	0.22	0.69	0.32
Nickel	16	16	14.7	28.2	20.99
Selenium	16	14	0.7	1.6	1.05
Zinc	16	16	51.5	127	78.43

SURFACE SOIL DATA
AREA A DOWNSTREAM AND OBDA **Over Bank Disposal Area**

SAMPLE ID:	3SD1	3SD1	3SD2	3SD2	3SD3	3SD3	3SD4	3SD4	3SD5	3SD5
DEPTH (in):	0-6	12-18	0-6	12-18	0-6	12-18	0-6	12-18	0-6	12-18
VOLATILE ORGANIC COMPOUNDS										
Nonchlorinated Aromatics										
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	2	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	4	ND	ND	ND
Xylene (total)	ND	ND	ND	ND	3	ND	ND	ND	ND	ND
Chlorinated Compounds										
Chloromethane										
1,1-Dichloroethane										
1,2-Dichloroethane										
1,1-Dichloroethene										
1,2-Dichloroethene (Total)										
Methylene Chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethane										
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	4	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane										
1,1,2-Trichloroethane										
Vinyl Chloride										
Other VOCs										
Acetone	ND	ND	ND	ND	150	210	310	140	54	130
2-Butanone	ND	6	4	6	32	51	66	33	13	24
4-Methyl-2-Pentanone										
Carbon Disulfide	ND	ND	ND	ND	3	4	ND	ND	2	11
SEMIVOLATILE COMPOUNDS										
Noncarcinogenic PAHs										
Acenaphthene	140	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene										

SURFACE SOIL DATA
AREA A DOWNSTREAM AND OBDA **Over Bank Disposal Area**

SAMPLE ID:	3SD1	3SD1	3SD2	3SD2	3SD3	3SD3	3SD4	3SD4	3SD5	3SD5
DEPTH (in):	**0-6**	**12-18**	**0-6**	**12-18**	**0-6**	**12-18**	**0-6**	**12-18**	**0-6**	**12-18**
Anthracene	330	ND	ND	ND	ND	ND	ND	ND	ND	390
Fluoranthene	1400	110	73	ND	ND	ND	1300	970	ND	1500
Fluorene	180	ND	ND	ND	ND	ND	ND	ND	ND	200
2-Methylnaphthalene										
Naphthalene	80	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	1300	ND	ND	ND	ND	ND	ND	ND	ND	1600
Pyrene	1400	140	170	ND	ND	ND	1300	1100	ND	1300
Carcinogenic PAHs										
Benzo(a)Anthracene	850	ND	45	ND	ND	ND	ND	ND	ND	720
Benzo(a)Pyrene	520	ND	ND	ND	ND	ND	ND	ND	ND	590
Benzo(b)Fluoranthene	750	ND	86	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)Perylene	260	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)Fluoranthene	290	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	700	ND	75	ND	ND	ND	ND	ND	ND	720
Dibenz(a,h)Anthracene										
Indeno(1,2,3-cd)Pyrene	360	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PAHs	8560	3850	3149	4200	4200	4200	6200	5670	4200	8820
Other Semi-Volatile Compounds										
bis(2-Ethylhexyl)Phthalate										
Di-n-Butylphthalate										
2,4-Dimethylphenol										
4,6-Dinitro-2-methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol	120	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol										
Phenol										
Benzoic Acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	100	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine (1)										

SURFACE SOIL DATA
AREA A DOWNSTREAM AND OBDA **Over Bank Disposal Area**

SAMPLE ID:	**3SD1**	**3SD1**	**3SD2**	**3SD2**	**3SD3**	**3SD3**	**3SD4**	**3SD4**	**3SD5**	**3SD5**
DEPTH (in):	**0-6**	**12-18**	**0-6**	**12-18**	**0-6**	**12-18**	**0-6**	**12-18**	**0-6**	**12-18**
PESTICIDES										
4,4' DDE	87	60	ND	ND	15000	2800	410	4800	11000	1500
4,4' DDD	89	140	190	59	300000	73000	3200	84000	99000	11000
4,4'-DDT	57	69	855	ND	37000	3800	3300	12000	1100	270
Total DDT Residue	*233*	*269*	*1059.55*	*88.1*	*352000*	*79600*	*6910*	*100800*	*111100*	*12770*
Beta-BHC										
Endrin										
Endrin Ketone										
Methoxychlor										
PCBs										
Aroclor 1260	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1254										
Metals										
Aluminum	4820	4660	4190	8050	18800	15100	13000	14400	14400	17400
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	5.6	3.6	19.7	1.9	6.1	6.8	39.9	10.2	7.7	6.6
Beryllium	1.2	0.37	0.74	0.52	1.2	1.2	1.8	0.81	0.68	0.75
Boron	660	720	8300	ND	6200	3500	400	2900	2200	2600
Cadmium	3.8	3.2	23.6	1.2	11.1	5.7	30.1	6.7	3.8	4.5
Copper	33.2	29.7	118	10.6	20.7	19	105	26.1	20.6	19.7
Iron	25400	15700	133000	8430	76800	37800	195000	47100	25400	27600
Lead	87.7	73.9	223	5	30.8	18	189	32.6	17.9	14.5
Manganese	166	118	382	104	342	377	1020	537	339	433
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	13	14.6	44.6	6.8	18.9	19.8	25.1	22.3	21.4	22.9
Selenium	0.83	0.33	1.1	ND	1.5	0.7	3.2	2.5	1.4	1.3
Zinc	145	155	2720	18.2	93.9	63.5	416	95.3	65.9	65.9

SURFACE SOIL DATA
AREA A DOWNSTREAM AND OBDA **Downstream Area**

SAMPLE ID:	2DMW10S	2DMW11S	3MW12S	2DMW15S	2DMW16S
DEPTH (in):	3-5	2-4	0-3	2-4	2-4
VOLATILE ORGANIC COMPOUNDS					
Nonchl rinated Aromatics					
Benzene					
Ethylbenzene					
Toluene	ND	ND	ND	100	ND
Xylene (total)					
Chlorinated Compounds					
Chloromethane					
1,1-Dichloroethane					
1,2-Dichloroethane					
1,1-Dichloroethene	ND	ND	ND	16	ND
1,2-Dichloroethene (Total)					
Methylene Chloride					
Tetrachloroethane					
Tetrachloroethene	ND	ND	ND	58	ND
Trichloroethene	6	ND	ND	24	ND
1,1,1-Trichloroethane					
1,1,2-Trichloroethane					
Vinyl Chloride					
Other VOCs					
Acetone	ND	ND	ND	79	ND
2-Butanone	ND	ND	32	ND	ND
4-Methyl-2-Pentanone					
Carbon Disulfide	ND	ND	ND	7	ND
SEMIVOLATILE COMPOUNDS					
N ncarcinogenic PAHs					
Acenaphthene					
Acenaphthylene					

SURFACE SOIL DATA
AREA A DOWNSTREAM AND OBDA **Downstream Area**

SAMPLE ID:	**2DMW10S**	**2DMW11S**	**3MW12S**	**2DMW15S**	**2DMW16S**
DEPTH (in):	**3-5**	**2-4**	**0-3**	**2-4**	**2-4**
Anthracene					
Fluoranthene	ND	ND	67	ND	ND
Fluorene					
2-Methylnaphthalene					
Naphthalene					
Phenanthrene					
Pyrene	ND	ND	54	ND	ND
Carcinogenic PAHs					
Benzo(a)Anthracene					
Benzo(a)Pyrene					
Benzo(b)Fluoranthene					
Benzo(g,h,i)Perylene					
Benzo(k)Fluoranthene	ND	ND	50	ND	ND
Chrysene					
Dibenz(a,h)Anthracene					
Indeno(1,2,3-cd)Pyrene					
Total PAHs	900	900	171	900	900
Other Semi-Volatile Compounds					
bis(2-Ethylhexyl)Phthalate	ND	140	160	ND	ND
Di-n-Butylphthalate					
2,4-Dimethylphenol					
4,6-Dinitro-2-methylphenol					
2-Methylphenol					
4-Methylphenol					
Phenol					
Benzoic Acid	ND	ND	82	ND	ND
4-Chloroaniline					
Dibenzofuran					
2-Nitroaniline					
N-Nitrosodiphenylamine (1)					

SURFACE SOIL DATA
AREA A DOWNSTREAM AND OBDA **Downstream Area**

SAMPLE ID:	**2DMW10S**	**2DMW11S**	**3MW12S**	**2DMW15S**	**2DMW16S**
DEPTH (in):	**3-5**	**2-4**	**0-3**	**2-4**	**2-4**
PESTICIDES					
4,4' DDE	ND	ND	27	ND	28
4,4' DDD	ND	ND	61	ND	ND
4,4'-DDT	ND	ND	24	ND	74
Total DDT Residue	*43.65*	*43.65*	*112*	*43.65*	*116.55*
Beta-BHC					
Endrin					
Endrin Ketone					
Methoxychlor					
PCBs					
Aroclor 1260					
Aroclor 1254					
Metals					
Aluminum	15500	17000	14000	26200	4080
Antimony	ND	ND	ND	ND	ND
Arsenic	2.5	2.2	2.6	3.1	0.58
Beryllium	0.42	0.75	0.52	0.72	ND
Boron	47	ND	300	46	41
Cadmium	1.8	5	5.1	2.4	ND
Copper	22.6	12.2	11.8	14.3	11.9
Iron	19800	16100	12000	22600	7220
Lead	5.1	15.1	17.8	7.5	28.1
Manganese	283	94.6	255	232	105
Mercury	ND	ND	ND	ND	ND
Nickel	11.3	14.3	16.4	13.4	4.4
Selenium	ND	ND	ND	ND	ND
Zinc	47.2	82.1	83.8	39	27.2

SURFACE SOIL DATA AREA A DOWNSTREAM AND OBDA	Over Bank Disposal Area Number Analyzed	Number Detected	Minimum	Maximum	Average
SAMPLE ID: **DEPTH (in):**					
VOLATILE ORGANIC COMPOUNDS					
Nonchlorinated Aromatics					
Benzene	10	0			
Ethylbenzene	10	1	2	2	4.29
Toluene	10	1	4	4	4.49
Xylene (total)	10	1	3	3	4.39
Chlorinated Compounds					
Chloromethane					
1,1-Dichloroethane					
1,2-Dichloroethane					
1,1-Dichloroethene					
1,2-Dichloroethene (Total)					
Methylene Chloride	10	1	2	2	4.29
Tetrachloroethane					
Tetrachloroethene	10	1	4	4	4.49
Trichloroethene	10	0			
1,1,1-Trichloroethane					
1,1,2-Trichloroethane					
Vinyl Chloride					
Other VOCs					
Acetone	10	6	54	310	103.04
2-Butanone	10	9	4	66	24.41
4-Methyl-2-Pentanone					
Carbon Disulfide	10	4	2	11	4.73
SEMIVOLATILE COMPOUNDS					
Noncarcinogenic PAHs					
Acenaphthene	10	1	140	140	284.00
Acenaphthylene					

SURFACE SOIL DATA AREA A DOWNSTREAM AND OBDA	Over Bank Disposal Area Number Analyzed	Number Detected	Minimum	Maximum	Average
SAMPLE ID:					
DEPTH (in):					
Anthracene	10	2	330	390	312.00
Fluoranthene	10	6	73	1500	655.30
Fluorene	10	2	180	200	278.00
2-Methylnaphthalene					
Naphthalene	10	1	80	80	278.00
Phenanthrene	10	2	1300	1600	530.00
Pyrene	10	6	140	1400	661.00
Carcinogenic PAHs					
Benzo(a)Anthracene	10	3	45	850	371.50
Benzo(a)Pyrene	10	2	520	590	351.00
Benzo(b)Fluoranthene	10	2	86	750	323.60
Benzo(g,h,i)Perylene	10	1	260	260	296.00
Benzo(k)Fluoranthene	10	1	290	290	299.00
Chrysene	10	3	75	720	359.50
Dibenz(a,h)Anthracene					
Indeno(1,2,3-cd)Pyrene	10	1	360	360	306.00
Total PAHs	10	10	3149	8820	5304.90
Other Semi-Volatile Compounds					
bis(2-Ethylhexyl)Phthalate					
Di-n-Butylphthalate					
2,4-Dimethylphenol					
4,6-Dinitro-2-methylphenol	10	0			
2-Methylphenol	10	1	120	120	282.00
4-Methylphenol					
Phenol					
Benzoic Acid	10	0			
4-Chloroaniline	10	0			
Dibenzofuran	10	1	100	100	280.00
2-Nitroaniline	10	0			
N-Nitrosodiphenylamine (1)					

SURFACE SOIL DATA AREA A DOWNSTREAM AND OBDA	Over Bank Disposal Area Number Analyzed	Number Detected	Minimum	Maximum	Average
SAMPLE ID: **DEPTH (in):**					
PESTICIDES					
4,4' DDE	10	8	60	15000	3568.61
4,4' DDD	10	10	59	300000	57067.80
4,4'-DDT	10	9	57	37000	5846.55
Total DDT Residue	10	10	88.1	352000	66482.97
Beta-BHC					
Endrin					
Endrin Ketone					
Methoxychlor					
PCBs					
Aroclor 1260	10	0			
Aroclor 1254					
Metals					
Aluminum	10	10	4190	18800	11482.00
Antim ny	10	0			
Arsenic	10	10	1.9	39.9	10.81
Beryllium	10	10	0.37	1.8	0.93
Boron	10	9	400	8300	2748.00
Cadmium	10	10	1.2	30.1	9.37
Copper	10	10	10.6	118	40.26
Iron	10	10	8430	195000	59223.00
Lead	10	10	5	223	69.24
Manganese	10	10	104	1020	381.80
Mercury	10	0			
Nickel	10	10	6.8	44.6	20.94
Selenium	10	9	0.33	3.2	1.29
Zinc	10	10	18.2	2720	383.87

SURFACE SOIL DATA AREA A DOWNSTREAM AND OBDA	Downstream Area Number Analyzed	Number Detected	Minimum	Maximum	Average
SAMPLE ID: DEPTH (in):					
VOLATILE ORGANIC COMPOUNDS					
Nonchlorinated Aromatics					
Benzene					
Ethylbenzene					
Toluene	5	1	100	100	23.64
Xylene (total)					
Chlorinated Compounds					
Chloromethane					
1,1-Dichloroethane					
1,2-Dichloroethane					
1,1-Dichloroethene	5	1	16	16	6.84
1,2-Dichloroethene (Total)					
Methylene Chloride					
Tetrachloroethane					
Tetrachloroethene	5	1	58	58	15.24
Trichloroethene	5	2	6	24	8.73
1,1,1-Trichloroethane					
1,1,2-Trichloroethane					
Vinyl Chloride					
Other VOCs					
Acetone	5	1	79	79	23.07
2-Butanone	5	1	32	32	13.67
4-Methyl-2-Pentanone					
Carbon Disulfide	5	1	7	7	5.04
SEMIVOLATILE COMPOUNDS					
N ncarcinogenic PAHs					
Acenaphthene					
Acenaphthylene					

SURFACE SOIL DATA AREA A DOWNSTREAM AND OBDA	Downstream Area Number Analyzed	Number Detected	Minimum	Maximum	Average
SAMPLE ID: **DEPTH (in):**					
Anthracene					
Fluoranthene	5	1	67	67	253.40
Fluorene					
2-Methylnaphthalene					
Naphthalene					
Phenanthrene					
Pyrene	5	1	54	54	250.80
Carcinogenic PAHs					
Benzo(a)Anthracene					
Benzo(a)Pyrene					
Benzo(b)Fluoranthene					
Benzo(g,h,i)Perylene					
Benzo(k)Fluoranthene	5	1	50	50	250.00
Chrysene					
Dibenz(a,h)Anthracene					
Indeno(1,2,3-cd)Pyrene					
Total PAHs				171	754.2
Other Semi-Volatile Compounds					
bis(2-Ethylhexyl)Phthalate	5	2	140	160	240.00
Di-n-Butylphthalate					
2,4-Dimethylphenol					
4,6-Dinitro-2-methylphenol					
2-Methylphenol					
4-Methylphenol					
Phenol					
Benzoic Acid	5	1	82	82	1180.04
4-Chloroaniline					
Dibenzofuran					
2-Nitroaniline					
N-Nitrosodiphenylamine (1)					

SURFACE SOIL DATA AREA A DOWNSTREAM AND OBDA	Downstream Area Number Analyzed	Number Detected	Minimum	Maximum	Average
SAMPLE ID: **DEPTH (in):**					
PESTICIDES					
4,4' DDE	5	2	27	28	19.73
4,4' DDD	5	1	61	61	23.84
4,4'-DDT	5	2	24	74	28.33
Total DDT Residue				*163*	*71.890909*
Beta-BHC					
Endrin					
Endrin Ketone					
Methoxychlor					
PCBs					
Aroclor 1260					
Aroclor 1254					
Metals					
Aluminum					
Antimony					
Arsenic					
Beryllium					
Boron					
Cadmium					
Copper					
Iron					
Lead					
Manganese					
Mercury					
Nickel					
Selenium					
Zinc					

SEDIMENT DATA
AREA A DOWNSTREAM

SAMPLE ID:	2DSD1	2DSD2	2DSD3	2DSD4	2DSD5	2DSD7	2DSD8	2DSD9	2DSD10	2DSD11	2DSD12
DEPTH (in):											
VOLATILE ORGANIC COMPOUNDS											
N nchl rinated Aromatics											
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorinated Compounds											
Chloromethane											
1,1-Dichloroethane											
1,2-Dichloroethane											
1,1-Dichloroethene											
1,2-Dichloroethene (Total)											
Methylene Chloride	ND	5	3	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethane											
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	3	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane											
1,1,2-Trichloroethane											
Vinyl Chloride											
Other VOCs											
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone											
Carbon Disulfide	ND	4	ND	ND	5	2	ND	ND	ND	ND	ND
SEMIVOLATILE COMPOUNDS											
Noncarcinogenic PAHs											
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	41	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	150	71

SEDIMENT DATA
AREA A DOWNSTREAM

SAMPLE ID:	2DSD1	2DSD2	2DSD3	2DSD4	2DSD5	2DSD7	2DSD8	2DSD9	2DSD10	2DSD11	2DSD12
DEPTH (in):											
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	160	68
Fluoranthene	ND	ND	ND	97	280	1000	ND	340	68	1300	590
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND	ND	130	ND
2-Methylnaphthalene											
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	130	210	980	ND	160	ND	1600	270
Pyrene	ND	ND	ND	190	380	810	1200	560	64	4700	2700
Carcinogenic PAHs											
Benzo(a)Anthracene	ND	ND	ND	ND	130	ND	ND	230	ND	780	700
Benzo(a)Pyrene	ND	ND	ND	ND	ND	ND	ND	180	ND	640	410
Benzo(b)Fluoranthene	ND	ND	ND	ND	140	ND	ND	340	47	520	500
Benzo(g,h,i)Perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	1200	730
Benzo(k)Fluoranthene	ND	ND	ND	ND	110	ND	ND	110	ND	300	170
Chrysene	ND	ND	ND	ND	170	ND	1200	220	ND	950	540
Dibenz(a,h)Anthracene											
Indeno(1,2,3-cd)Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	1200	750
Other Semi-Volatile Compounds											
bis(2-Ethylhexyl)Phthalate											
Di-n-Butylphthalate											
2,4-Dimethylphenol											
4,6-Dinitro-2-methylphenol	ND	6200	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol											
Phenol											
Benzoic Acid	ND	ND	ND	160	ND	ND	ND	ND	ND	46	91
4-Chloroaniline	ND	ND	ND	ND	ND	510	ND	ND	ND	ND	ND
Dibenzofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitroaniline	ND	3100	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine (1)											

SEDIMENT DATA
AREA A DOWNSTREAM

SAMPLE ID:	2DSD1	2DSD2	2DSD3	2DSD4	2DSD5	2DSD7	2DSD8	2DSD9	2DSD10	2DSD11	2DSD12
DEPTH (in):											
PESTICIDES											
4,4' DDE	6300	3100	1500	28000	17	170	350	ND	ND	120	ND
4,4' DDD	23000	90000	18000	1700000	1000	3300	14000	12000	ND	ND	ND
4,4'-DDT	ND	1400	60	240000	29	1400	610	7000	ND	ND	68
Beta-BHC											
Endrin											
Endrin Ketone											
Methoxychlor											
PCBs											
Aroclor 1260	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	280
Aroclor 1254											
INORGANICS											
Metals											
Aluminum	32100	33100	11500	11500	9910	9460	15300	5100	8830	1710	4060
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	5	7.5	4	ND	4.2	3.2	3.8	1.1	4.5	1.1	0.83
Beryllium	4.1	5.4	1.6	ND	0.58	1.5	1.5	0.46	0.36	ND	ND
Boron	870	660	320	4100	1700	530	840	ND	63	60	650
Cadmium	13.8	12.3	4.2	4	3	6.1	4.3	1.2	1.7	1.4	1.8
Copper	94.3	78.7	21.1	21.7	14	30.9	45.7	13.9	36.5	16	13.1
Iron	18900	62400	25600	17100	17500	33200	20300	8960	9930	8560	9300
Lead	51.5	50	18.7	55.3	22.1	64.2	27.4	13.8	13.1	38.2	10.9
Manganese	137	222	129	311	411	145	236	149	177	191	102
Mercury	ND	ND	ND	ND	ND	0.26	0.15	ND	ND	ND	ND
Nickel	26.5	27.9	10.1	25.2	8.4	10.6	19.1	6.9	8.6	4.1	6.5
Selenium	ND	ND	ND	3	0.65	ND	ND	ND	ND	ND	ND
Zinc	617	291	73	85.4	44.1	118	135	44.4	37.7	44.2	41.9

SEDIMENT DATA AREA A DOWNSTREAM			Number Analyzed	Number Detected	Minimum	Maximum	Average
SAMPLE ID:	**2DSD13**	**7SD1**					
DEPTH (in):							
VOLATILE ORGANIC COMPOUNDS							
N nchl rinated Aromatics							
Benzene	ND	ND	13	0			
Ethylbenzene	ND	ND	13	0			
Toluene	ND	ND	13	0			
Xylene (total)	ND	ND	13	0			
Chlorinated Compounds							
Chloromethane							
1,1-Dichlor ethane							
1,2-Dichloroethane							
1,1-Dichloroethene							
1,2-Dichloroethene (Total)							
Methylene Chloride	ND	ND	13	2	3	5	4.46
Tetrachloroethane							
Tetrachloroethene	ND	ND	13	0			
Trichloroethene	ND	ND	13	1	3	3	4.43
1,1,1-Trichloroethane							
1,1,2-Trichloroethane							
Vinyl Chloride							
Other VOCs							
Acetone	ND	ND	13	0			
2-Butanone	ND	ND	13	0			
4-Methyl-2-Pentanone							
Carbon Disulfide	ND	ND	13	3	2	5	4.34
SEMIVOLATILE COMPOUNDS							
Noncarcinogenic PAHs							
Acenaphthene	ND	ND	13	1	41	41	280.08
Acenaphthylene	65	ND	13	3	65	150	252.77

SEDIMENT DATA AREA A DOWNSTREAM			Number Analyzed	Number Detected	Minimum	Maximum	Average
SAMPLE ID:	**2DSD13**	**7SD1**					
DEPTH (in):							
Anthracene	91	ND	13	3	68	160	255.31
Fluoranthene	750	210	13	9	68	1300	448.85
Fluorene	51	ND	13	2	51	130	267.77
2-Methylnaphthalene							
Naphthalene	ND	ND	13	0			
Phenanthrene	500	140	13	8	130	1600	422.31
Pyrene	640	200	13	10	64	4700	949.54
Carcinogenic PAHs							
Benzo(a)Anthracene	430	84	13	6	84	780	342.62
Benzo(a)Pyrene	310	ND	13	4	180	640	326.15
Benzo(b)Fluoranthene	320	ND	13	6	47	520	305.15
Benzo(g,h,i)Perylene	ND	ND	13	2	730	1200	402.31
Benzo(k)Fluoranthene	320	ND	13	5	110	320	262.31
Chrysene	420	110	13	7	110	1200	416.15
Dibenz(a,h)Anthracene							
Indeno(1,2,3-cd)Pyrene	110	ND	13	3	110	1200	389.23
Other Semi-Volatile Compounds							
bis(2-Ethylhexyl)Phthalate							
Di-n-Butylphthalate							
2,4-Dimethylphenol							
4,6-Dinitro-2-methylphenol	ND	ND	13	1	6200	6200	1819.58
2-Methylphenol	ND	ND	13	0			
4-Methylphenol							
Phenol							
Benzoic Acid	ND	ND	13	2	46	91	1241.31
4-Chloroaniline	ND	ND	13	1	510	510	316.15
Dibenzofuran	ND	ND	13	0			
2-Nitroaniline	ND	ND	13	1	3100	3100	1581.12
N-Nitrosodiphenylamine (1)							

SEDIMENT DATA AREA A DOWNSTREAM			Number Analyzed	Number Detected	Minimum	Maximum	Average
SAMPLE ID:	**2DSD13**	**7SD1**					
DEPTH (in):							
PESTICIDES							
4,4' DDE	ND	ND	13	8	17	28000	3048.44
4,4' DDD	ND	ND	13	8	1000	1700000	143182.52
4,4'-DDT	120	ND	13	9	29	240000	19288.09
Beta-BHC							
Endrin							
Endrin Ketone							
Methoxychlor							
PCBs							
Aroclor 1260	ND	ND	13	1	280	280	155.80
Aroclor 1254							
INORGANICS							
Metals							
Aluminum	3030	11900	13	13	1710	33100	12115.38
Antimony	ND	ND	13	0			
Arsenic	1.1	5.6	13	12	0.83	7.5	3.30
Beryllium	ND	0.49	13	9	0.36	5.4	1.38
Boron	60	67	13	12	60	4100	766.15
Cadmium	1.7	2.4	13	13	1.2	13.8	4.45
Copper	8.8	16.4	13	13	8.8	94.3	31.62
Iron	8000	11600	13	13	8000	62400	19334.62
Lead	8.7	13.5	13	13	8.7	64.2	29.80
Manganese	657	147	13	13	102	657	231.85
Mercury	ND	ND	13	2	0.15	0.26	0.12
Nickel	4.6	9.5	13	13	4.1	27.9	12.92
Selenium	ND	0.28	13	3	0.28	3	0.69
Zinc	41	56.5	13	13	37.7	617	125.32

APPENDIX F-3
RISKS TO SOIL INVERTEBRATES - AREA A
EQUILIBRIUM PARTITIONING CALCULATIONS

RISKS TO SOIL INVERTEBRATES - AREA A WETLANDS
Equilibrium Partitioning Approach

	Koc	Chronic Criterion, ppb	Sediment Quality Criterion, ppb	2WMW5S (0-2 feet) Soil Value, ppb	Toxicity Quotient	2WMW6S (2-4 feet) Soil Value, ppb	Toxicity Quotient	2WTB2 (0-2 feet) Soil Value ppb	Toxicity Quotient
VOLATILE ORGANIC COMPO NDS									
Nonchlorinated Aromatics									
Benzene	8.30E+01	500	2075		0.00		0.00		0.00
Ethylbenzene	1.10E+03	3750	206250	ND	0.00	ND	0.00	ND	0.00
Toluene	3.00E+02	635	9525	ND	0.00	ND	0.00	ND	0.00
Xylene (total)	2.40E+02	675	8100	ND	0.00	ND	0.00	ND	0.00
Chlorinated Compounds									
Chloromethane	2.70E+01				0.00		0.00		0.00
1,1-Dichloroethane	3.00E+01	580	870		0.00		0.00		0.00
1,2-Dichloroethane	1.40E+01	2000	1400		0.00		0.00		0.00
1,1-Dichloroethene	6.50E+01	580	1885	ND	0.00	ND	0.00	ND	0.00
Cis-1,2-dichloroethene	4.90E+01	580	1421		0.00		0.00		0.00
Trans-1,2-dichloroethene	5.90E+01	580	1711		0.00		0.00		0.00
Methylene Chloride	8.80E+00	11000	4840	ND	0.00	ND	0.00	ND	0.00
Tetrachloroethane	1.18E+02	2400	14160		0.00		0.00		0.00
Tetrachloroethene	3.64E+02	84	1528.8	3	0.00	3	0.00	ND	0.00
Trichloroethene	1.26E+02	2190	13797	ND	0.00	ND	0.00	ND	0.00
1,1,1-Trichloroethane	1.52E+02	900	6840		0.00		0.00		0.00
1,1,2-Trichloroethane	5.60E+01	900	2520		0.00		0.00		0.00
Vinyl Chloride	5.70E+01		0		0.00		0.00		0.00
Other VOCs									
Acetone	2.20E+00	5000	550	ND	0.01	74	0.13	ND	0.01
2-Butanone	4.50E+00	5000	1125	ND	0.01	ND	0.01	ND	0.01
4-Methyl-2-Pentanone	2.09E+01		0		0.00		0.00		0.00
Carbon Disulfide	5.40E+01		0	ND		15		ND	
T tal Toxicity Quotient - VOCs					**0.03**		**0.15**		**0.03**
SEMIVOLATILE COMPOUNDS									
Noncarcinogenic PAHs									
Acenaphthene	4.60E+03	86	19780	ND	0.01	ND	0.01	ND	0.01

RISKS TO SOIL INVERTEBRATES - AREA A WETLANDS
Equilibrium Partitioning Approach

				2WMW5S (0-2 feet)		2WMW6S (2-4 feet)		2WTB2 (0-2 feet)	
	Koc	Chronic Criterion, ppb	Sediment Quality Criterion, ppb	Soil Value, ppb	Toxicity Quotient	Soil Value, ppb	Toxicity Quotient	Soil Value ppb	Toxicity Quotient
Acenaphthylene	2.50E+03	13	1625	ND	0.16	ND	0.16	ND	0.16
Anthracene	1.40E+04	13	9100	ND	0.03	ND	0.03	ND	0.03
Fluoranthene	3.80E+04	13	24700	180	0.01	460	0.02	460	0.02
Fluorene	7.30E+03	13	4745	ND	0.05	ND	0.05	ND	0.05
2-Methylnaphthalene	4.08E+03		0		0.00		0.00		0.00
Naphthalene	1.22E+58	62	3.796E+58	ND	0.00	ND	0.00	ND	0.00
Phenanthrene	1.40E+04	35	24500	130	0.01	ND	0.01	ND	0.01
Pyrene	3.80E+04	13	24700	320	0.01	360	0.01	380	0.02
Carcinogenic PAHs									
Benzo(a)Anthracene	1.38E+06	3	207000	160	0.00	370	0.00	400	0.00
Benzo(a)Pyrene	5.50E+06	1.2	330000	ND	0.00	ND	0.00	ND	0.00
Benzo(b)Fluoranthene	5.50E+05	35	962500	180	0.00	ND	0.00	ND	0.00
Benzo(g,h,i)Perylene	1.60E+06	1.2	96000	ND	0.00	ND	0.00	ND	0.00
Benzo(k)Fluoranthene	5.50E+05	35	962500	120	0.00	ND	0.00	ND	0.00
Chrysene	2.00E+05	13	130000	230	0.00	330	0.00	ND	0.00
Dibenz(a,h)Anthracene	3.30E+06	1.2	198000		0.00		0.00		0.00
Indeno(1,2,3-cd)Pyrene	1.60E+06	1.2	96000	ND	0.00	ND	0.00	ND	0.00
Other Semi-Volatile Compounds									
bis(2-Ethylhexyl)Phthalate	6.05E+04	0.3	907.5	790	0.87	ND	0.28	ND	0.28
Di-n-Butylphthalate	1.70E+05	105	892500		0.00		0.00		0.00
2,4-Dimethylphenol	9.60E+01		0		0.00		0.00		0.00
4,6-Dinitro-2-methylphenol	2.40E+02		0		0.00		0.00		0.00
2-Methylphenol	6.62E+01			ND		ND		ND	
4-Methylphenol	6.48E+01		0		0.00		0.00		0.00
Phenol	1.42E+01	256	181.76		0.00		0.00		0.00
Benzoic Acid	5.57E+01	6450	17963.25	ND	0.07	ND	0.07	ND	0.07
4-Chloroaniline	5.11E+01		0		0.00		0.00		0.00
Dibenzofuran	7.15E+03			ND		ND		ND	
2-Nitroaniline	9.80E+01		0		0.00		0.00		0.00
N-Nitrosodiphenylamine (1)	8.45E+02		0		0.00		0.00		0.00

RISKS TO SOIL INVERTEBRATES - AREA A WETLANDS
Equilibrium Partitioning Approach

	Koc	Chronic Criterion, ppb	Sediment Quality Criterion, ppb	2WMW5S (0-2 feet) Soil Value, ppb	2WMW5S (0-2 feet) Toxicity Quotient	2WMW6S (2-4 feet) Soil Value, ppb	2WMW6S (2-4 feet) Toxicity Quotient	2WTB2 (0-2 feet) Soil Value ppb	2WTB2 (0-2 feet) Toxicity Quotient
T tal Toxicity Quotient - SVOCs					**1.23**		**0.66**		**0.66**
PESTICIDES									
4,4' DDE	4.40E+06	0.001	220	ND	0.06	ND	0.06	ND	0.06
4,4' DDD	7.70E+05	0.001	38.5	ND	0.32	ND	0.32	ND	0.32
4,4'-DDT	2.43E+05	0.001	12.15	ND	1.03	ND	1.03	ND	1.03
Beta-BHC	5.12E+03		0		0.00		0.00		0.00
Endrin	1.70E+03	0.0023	0.1955		0.00		0.00		0.00
Endrin Ketone			0		0.00		0.00		0.00
Methoxychlor	8.00E+04	0.03	120		0.00		0.00		0.00
Total Toxicity Quotient - Pesticides					**1.41**		**1.41**		**1.41**
PCBs									
Aroclor 1260	5.30E+05	0.014	371	ND	0.34	ND	0.34	370	1.00
Aroclor 1254	5.30E+05	0.014	371		0.00		0.00		0.00
Total Toxicity Quotient - PCBs					**0.34**		**0.34**		**1.00**

RISKS TO SOIL INVERTEBRATES - AREA A WETLANDS
Equilibrium Partitioning Approach

	2WTB4 (0-2 feet)		2WTB6 (0-2feet)		2WTB7 (0-2 feet)		2WTB8 (1-3 feet)		2WSD1	
	Soil Value ppb	Toxicity Quotient	Soil Value ppb	Toxicity Quotient	Soil Value ppb	Toxicity Quotient	Soil Value, ppb	Toxicity Quotient	Soil Value, ppb	Toxicity Quotient
VOLATILE ORGANIC COMPO										
Nonchlorinated Aromatics										
Benzene		0.00		0.00		0.00		0.00		0.00
Ethylbenzene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Toluene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Xylene (total)	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Chlorinated Compounds										
Chloromethane		0.00		0.00		0.00		0.00		0.00
1,1-Dichloroethane		0.00		0.00		0.00		0.00		0.00
1,2-Dichloroethane		0.00		0.00		0.00		0.00		0.00
1,1-Dichloroethene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Cis-1,2-dichloroethene		0.00		0.00		0.00		0.00		0.00
Trans-1,2-dichloroethene		0.00		0.00		0.00		0.00		0.00
Methylene Chloride	ND	0.00	ND	0.00	ND	0.00	4	0.00	ND	0.00
Tetrachloroethane		0.00		0.00		0.00		0.00		0.00
Tetrachloroethene	ND	0.00	ND	0.00	ND	0.00	7	0.00	ND	0.00
Trichloroethene	4	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
1,1,1-Trichloroethane		0.00		0.00		0.00		0.00		0.00
1,1,2-Trichloroethane		0.00		0.00		0.00		0.00		0.00
Vinyl Chloride		0.00		0.00		0.00		0.00		0.00
Other VOCs										
Acetone	ND	0.01	540	0.98	ND	0.01	850	1.55	210	0.38
2-Butanone	ND	0.01	87	0.08	ND	0.01	310	0.28	140	0.12
4-Methyl-2-Pentanone		0.00		0.00		0.00		0.00		0.00
Carbon Disulfide	ND		6		ND		8		11	
Total Toxicity Quotient - VOCs		**0.03**		**1.07**		**0.03**		**1.83**		**0.51**
SEMIVOLATILE COMPOUNDS										
Noncarcinogenic PAHs										
Acenaphthene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01

RISKS TO SOIL INVERTEBRATES - AREA A WETLANDS
Equilibrium Partitioning Approach

	2WTB4 (0-2 feet)		2WTB6 (0-2feet)		2WTB7 (0-2 feet)		2WTB8 (1-3 feet)		2WSD1	
	Soil Value ppb	Toxicity Quotient	Soil Value ppb	Toxicity Quotient	Soil Value ppb	Toxicity Quotient	Soil Value, ppb	Toxicity Quotient	Soil Value, ppb	Toxicity Quotient
Acenaphthylene	77	0.05	ND	0.16	ND	0.16	120	0.07	ND	0.16
Anthracene	52	0.01	ND	0.03	ND	0.03	79	0.01	ND	0.03
Fluoranthene	310	0.01	300	0.01	72	0.00	600	0.02	970	0.04
Fluorene	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05
2-Methylnaphthalene		0.00		0.00		0.00		0.00		0.00
Naphthalene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Phenanthrene	270	0.01	160	0.01	ND	0.01	340	0.01	ND	0.01
Pyrene	460	0.02	270	0.01	98	0.00	570	0.02	1300	0.05
Carcinogenic PAHs										
Benzo(a)Anthracene	220	0.00	200	0.00	ND	0.00	370	0.00	670	0.00
Benzo(a)Pyrene	230	0.00	190	0.00	ND	0.00	390	0.00	ND	0.00
Benzo(b)Fluoranthene	220	0.00	210	0.00	ND	0.00	550	0.00	380	0.00
Benzo(g,h,i)Perylene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(k)Fluoranthene	310	0.00	250	0.00	ND	0.00	390	0.00	480	0.00
Chrysene	320	0.00	250	0.00	ND	0.00	600	0.00	630	0.00
Dibenz(a,h)Anthracene		0.00		0.00		0.00		0.00		0.00
Indeno(1,2,3-cd)Pyrene	ND	0.00	ND	0.00	ND	0.00	270	0.00	ND	0.00
Other Semi-Volatile Compounds										
bis(2-Ethylhexyl)Phthalate	280	0.31	350	0.39	ND	0.28	1300	1.43	ND	0.28
Di-n-Butylphthalate		0.00		0.00		0.00		0.00		0.00
2,4-Dimethylphenol		0.00		0.00		0.00		0.00		0.00
4,6-Dinitro-2-methylphenol		0.00		0.00		0.00		0.00		0.00
2-Methylphenol	ND		ND		ND		ND		ND	
4-Methylphenol		0.00		0.00		0.00		0.00		0.00
Phenol		0.00		0.00		0.00		0.00		0.00
Benzoic Acid	160	0.01	130	0.01	ND	0.07	ND	0.07	ND	0.07
4-Chloroaniline		0.00		0.00		0.00		0.00		0.00
Dibenzofuran	ND		ND		ND		ND		ND	
2-Nitroaniline		0.00		0.00		0.00		0.00		0.00
N-Nitrosodiphenylamine (1)		0.00		0.00		0.00		0.00		0.00

RISKS TO SOIL INVERTEBRATES - AREA A WETLANDS
Equilibrium Partitioning Approach

	2WTB4 (0-2 feet)		2WTB6 (0-2feet)		2WTB7 (0-2 feet)		2WTB8 (1-3 feet)		2WSD1	
	Soil Value ppb	Toxicity Quotient	Soil Value ppb	Toxicity Quotient	Soil Value ppb	Toxicity Quotient	Soil Value, ppb	Toxicity Quotient	Soil Value, ppb	Toxicity Quotient
Total Toxicity Quotient - SVOCs		**0.49**		**0.69**		**0.64**		**1.73**		**0.73**
PESTICIDES										
4,4' DDE	32	0.15	ND	0.06	ND	0.06	ND	0.06	36	0.16
4,4' DDD	ND	0.32	69	1.79	ND	0.32	ND	0.32	140	3.64
4,4'-DDT	ND	1.03	ND	1.03	ND	1.03	ND	1.03	ND	1.03
Beta-BHC		0.00		0.00		0.00		0.00		0.00
Endrin		0.00		0.00		0.00		0.00		0.00
Endrin Ketone		0.00		0.00		0.00		0.00		0.00
Methoxychlor		0.00		0.00		0.00		0.00		0.00
Total Toxicity Quotient - Pesticide		**1.50**		**2.88**		**1.41**		**1.41**		**4.83**
PCBs										
Aroclor 1260	ND	0.34	ND	0.34	ND	0.34	ND	0.34	ND	0.34
Aroclor 1254		0.00		0.00		0.00		0.00		0.00
Total Toxicity Quotient - PCBs		**0.34**		**0.34**		**0.34**		**0.34**		**0.34**

RISKS TO SOIL INVERTEBRATES - AREA A WETLANDS
Equilibrium Partitioning Approach

	2WSD2 Soil Value, ppb	Toxicity Quotient	2WSD3 Soil Value, ppb	Toxicity Quotient	2WSD4 Soil Value, ppb	Toxicity Quotient	2WSD5 Soil Value, ppb	Toxicity Quotient	2WSD6 Soil Value, ppb	Toxicity Quotient
VOLATILE ORGANIC COMPO										
Nonchlorinated Aromatics										
Benzene		0.00		0.00		0.00		0.00		0.00
Ethylbenzene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Toluene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Xylene (total)	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Chlorinated Compounds										
Chloromethane		0.00		0.00		0.00		0.00		0.00
1,1-Dichloroethane		0.00		0.00		0.00		0.00		0.00
1,2-Dichloroethane		0.00		0.00		0.00		0.00		0.00
1,1-Dichloroethene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Cis-1,2-dichloroethene		0.00		0.00		0.00		0.00		0.00
Trans-1,2-dichloroethene		0.00		0.00		0.00		0.00		0.00
Methylene Chloride	ND	0.00	ND	0.00	10	0.00	3	0.00	10	0.00
Tetrachloroethane		0.00		0.00		0.00		0.00		0.00
Tetrachloroethene	ND	0.00	ND	0.00	16	0.01	4	0.00	10	0.01
Trichloroethene	ND	0.00	ND	0.00	11	0.00	3	0.00	ND	0.00
1,1,1-Trichloroethane		0.00		0.00		0.00		0.00		0.00
1,1,2-Trichloroethane		0.00		0.00		0.00		0.00		0.00
Vinyl Chloride		0.00		0.00		0.00		0.00		0.00
Other VOCs										
Acetone	130	0.24	230	0.42	ND	0.01	ND	0.01	240	0.44
2-Butanone	100	0.09	ND	0.01	ND	0.01	ND	0.01	ND	0.01
4-Methyl-2-Pentanone		0.00		0.00		0.00		0.00		0.00
Carbon Disulfide	16		18		ND		ND		9	
Total Toxicity Quotient - VOCs		**0.33**		**0.43**		**0.04**		**0.03**		**0.46**
SEMIVOLATILE COMPOUNDS										
Noncarcinogenic PAHs										
Acenaphthene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01

RISKS TO SOIL INVERTEBRATES - AREA A WETLANDS
Equilibrium Partitioning Approach

	2WSD2 Soil Value, ppb	Toxicity Quotient	2WSD3 Soil Value, ppb	Toxicity Quotient	2WSD4 Soil Value, ppb	Toxicity Quotient	2WSD5 Soil Value, ppb	Toxicity Quotient	2WSD6 Soil Value, ppb	Toxicity Quotient
Acenaphthylene	ND	0.16	ND	0.16	ND	0.16	ND	0.16	ND	0.16
Anthracene	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.03
Fluoranthene	ND	0.01	390	0.02	410	0.02	ND	0.01	ND	0.01
Fluorene	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05
2-Methylnaphthalene		0.00		0.00		0.00		0.00		0.00
Naphthalene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Phenanthrene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Pyrene	ND	0.01	670	0.03	460	0.02	ND	0.01	470	0.02
Carcinogenic PAHs										
Benzo(a)Anthracene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(a)Pyrene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(b)Fluoranthene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(g,h,i)Perylene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(k)Fluoranthene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Chrysene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Dibenz(a,h)Anthracene		0.00		0.00		0.00		0.00		0.00
Indeno(1,2,3-cd)Pyrene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Other Semi-Volatile Compounds										
bis(2-Ethylhexyl)Phthalate	ND	0.28	ND	0.28	ND	0.28	ND	0.28	ND	0.28
Di-n-Butylphthalate		0.00		0.00		0.00		0.00		0.00
2,4-Dimethylphenol		0.00		0.00		0.00		0.00		0.00
4,6-Dinitro-2-methylphenol		0.00		0.00		0.00		0.00		0.00
2-Methylphenol	ND		ND		ND		ND		ND	
4-Methylphenol		0.00		0.00		0.00		0.00		0.00
Phenol		0.00		0.00		0.00		0.00		0.00
Benzoic Acid	ND	0.07	ND	0.07	ND	0.07	ND	0.07	ND	0.07
4-Chloroaniline		0.00		0.00		0.00		0.00		0.00
Dibenzofuran	ND		ND		ND		ND		ND	
2-Nitroaniline		0.00		0.00		0.00		0.00		0.00
N-Nitrosodiphenylamine (1)		0.00		0.00		0.00		0.00		0.00

RISKS TO SOIL INVERTEBRATES - AREA A WETLANDS
Equilibrium Partitioning Approach

	2WSD2 Soil Value, ppb	Toxicity Quotient	2WSD3 Soil Value, ppb	Toxicity Quotient	2WSD4 Soil Value, ppb	Toxicity Quotient	2WSD5 Soil Value, ppb	Toxicity Quotient	2WSD6 Soil Value, ppb	Toxicity Quotient
T tal Toxicity Quotient - SVOCs		**0.65**		**0.67**		**0.66**		**0.65**		**0.66**
PESTICIDES										
4,4' DDE	40	0.18	ND	0.06	ND	0.06	ND	0.06	ND	0.06
4,4' DDD	ND	0.32	ND	0.32	ND	0.32	ND	0.32	ND	0.32
4,4'-DDT	ND	1.03	57	4.69	ND	1.03	ND	1.03	ND	1.03
Beta-BHC		0.00		0.00		0.00		0.00		0.00
Endrin		0.00		0.00		0.00		0.00		0.00
Endrin Ketone		0.00		0.00		0.00		0.00		0.00
Methoxychlor		0.00		0.00		0.00		0.00		0.00
Total Toxicity Quotient - Pesticide		**1.54**		**5.07**		**1.41**		**1.41**		**1.41**
PCBs										
Aroclor 1260	ND	0.34	ND	0.34	ND	0.34	ND	0.34	ND	0.34
Aroclor 1254		0.00		0.00		0.00		0.00		0.00
Total Toxicity Quotient - PCBs		**0.34**		**0.34**		**0.34**		**0.34**		**0.34**

RISKS TO SOIL INVERTEBRATES - WETLANDS
Equilibrium Partitioning Approach

	2WSD7 Soil Value, ppb	Toxicity Quotient	2WSD8 Soil Value, ppb	Toxicity Quotient	2WSD9 Soil Value, ppb	Toxicity Quotient
VOLATILE ORGANIC COMPO						
Nonchlorinated Aromatics						
Benzene		0.00		0.00		0.00
Ethylbenzene	ND	0.00	ND	0.00	ND	0.00
Toluene	ND	0.00	ND	0.00	ND	0.00
Xylene (total)	ND	0.00	ND	0.00	ND	0.00
Chlorinated Compounds						
Chloromethane		0.00		0.00		0.00
1,1-Dichloroethane		0.00		0.00		0.00
1,2-Dichloroethane		0.00		0.00		0.00
1,1-Dichloroethene	ND	0.00	ND	0.00	ND	0.00
Cis-1,2-dichloroethene		0.00		0.00		0.00
Trans-1,2-dichloroethene		0.00		0.00		0.00
Methylene Chloride	ND	0.00	2	0.00	5	0.00
Tetrachloroethane		0.00		0.00		0.00
Tetrachloroethene	ND	0.00	ND	0.00	11	0.01
Trichloroethene	ND	0.00	ND	0.00	6	0.00
1,1,1-Trichloroethane		0.00		0.00		0.00
1,1,2-Trichloroethane		0.00		0.00		0.00
Vinyl Chloride		0.00		0.00		0.00
Other VOCs						
Acetone	720	1.31	190	0.35	ND	0.01
2-Butanone	ND	0.01	ND	0.01	ND	0.01
4-Methyl-2-Pentanone		0.00		0.00		0.00
Carbon Disulfide	ND		15		ND	
Total Toxicity Quotient - VOCs		**1.32**		**0.36**		**0.03**
SEMIVOLATILE COMPOUNDS						
Noncarcinogenic PAHs						
Acenaphthene	ND	0.01	ND	0.01	ND	0.01

RISKS TO SOIL INVERTEBRATES - WETLANDS
Equilibrium Partitioning Approach

	2WSD7 Soil Value, ppb	Toxicity Quotient	2WSD8 Soil Value, ppb	Toxicity Quotient	2WSD9 Soil Value, ppb	Toxicity Quotient
Acenaphthylene	ND	0.16	ND	0.16	ND	0.16
Anthracene	ND	0.03	ND	0.03	2400	0.26
Fluoranthene	470	0.02	1300	0.05	80000	3.24
Fluorene	ND	0.05	ND	0.05	1000	0.21
2-Methylnaphthalene		0.00		0.00		0.00
Naphthalene	ND	0.00	ND	0.00	ND	0.00
Phenanthrene	ND	0.01	440	0.02	36000	1.47
Pyrene	610	0.02	1500	0.06	42000	1.70
Carcinogenic PAHs						
Benzo(a)Anthracene	ND	0.00	ND	0.00	27000	0.13
Benzo(a)Pyrene	ND	0.00	ND	0.00	35000	0.11
Benzo(b)Fluoranthene	ND	0.00	420	0.00	55000	0.06
Benzo(g,h,i)Perylene	ND	0.00	ND	0.00	23000	0.24
Benzo(k)Fluoranthene	ND	0.00	670	0.00	45000	0.05
Chrysene	ND	0.00	610	0.00	42000	0.32
Dibenz(a,h)Anthracene		0.00		0.00		0.00
Indeno(1,2,3-cd)Pyrene	ND	0.00	ND	0.00	23000	0.24
Other Semi-Volatile Compounds						
bis(2-Ethylhexyl)Phthalate	ND	0.28	ND	0.28	ND	0.28
Di-n-Butylphthalate		0.00		0.00		0.00
2,4-Dimethylphenol		0.00		0.00		0.00
4,6-Dinitro-2-methylphenol		0.00		0.00		0.00
2-Methylphenol	ND		ND		ND	
4-Methylphenol		0.00		0.00		0.00
Phenol		0.00		0.00		0.00
Benzoic Acid	780	0.04	ND	0.07	ND	0.07
4-Chloroaniline		0.00		0.00		0.00
Dibenzofuran	ND		ND		1000	
2-Nitroaniline		0.00		0.00		0.00
N-Nitrosodiphenylamine (1)		0.00		0.00		0.00

RISKS TO SOIL INVERTEBRATES - WETLANDS
Equilibrium Partitioning Approach

	2WSD7 Soil Value, ppb	Toxicity Quotient	2WSD8 Soil Value, ppb	Toxicity Quotient	2WSD9 Soil Value, ppb	Toxicity Quotient
Total Toxicity Quotient - SVOCs		**0.65**		**0.75**		**8.55**
PESTICIDES						
4,4' DDE	ND	0.06	ND	0.06	ND	0.06
4,4' DDD	ND	0.32	ND	0.32	ND	0.32
4,4'-DDT	ND	1.03	ND	1.03	ND	1.03
Beta-BHC		0.00		0.00		0.00
Endrin		0.00		0.00		0.00
Endrin Ketone		0.00		0.00		0.00
Methoxychlor		0.00		0.00		0.00
Total Toxicity Quotient - Pesticide		**1.41**		**1.41**		**1.41**
PCBs						
Aroclor 1260	ND	0.34	ND	0.34	ND	0.34
Aroclor 1254		0.00		0.00		0.00
Total Toxicity Quotient - PCBs		**0.34**		**0.34**		**0.34**

Risks t Soil Invertebrates\Area A Downstream and OBDA
Equilibrium Partitioning Approach

SURFACE SOIL DATA (0-4 FEET)	Koc	Chronic Criterion, ppb	Sediment Quality Criterion, ppb	OBDA 3SD1 Soil Value, ppb	(0-6 in) Toxicity Quotient	3SD1 Soil Value, ppb	(12-18 in) Toxicity Quotient	3SD2 Soil Value, ppb	(0-6 in) Toxicity Quotient	3SD2 Soil Value, ppb	(12-18 in) Toxicity Quotient
VOLATILE ORGANIC COMPOUNDS											
Nonchlorinated Aromatics											
Benzene	8.30E+01	500	2075		0.00		0.00		0.00		0.00
Ethylbenzene	1.10E+03	3750	206250	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Toluene	3.00E+02	635	9525	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Xylene (total)	2.40E+02	675	8100	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Chlorinated Compounds											
Chloromethane	2.70E+01	find			0.00		0.00		0.00		0.00
1,1-Dichloroethane	3.00E+01	580	870		0.00		0.00		0.00		0.00
1,2-Dichloroethane	1.40E+01	2000	1400		0.00		0.00		0.00		0.00
1,1-Dichloroethene	6.50E+01	580	1885	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Cis-1,2-dichloroethene	4.90E+01	580	1421		0.00		0.00		0.00		0.00
Trans-1,2-dichloroethene	5.90E+01	580	1711		0.00		0.00		0.00		0.00
Methylene Chloride	8.80E+00	11000	4840	2	0.00	ND	0.00	ND	0.00	ND	0.00
Tetrachloroethane	1.18E+02	2400	14160		0.00		0.00		0.00		0.00
Tetrachloroethene	3.64E+02	84	1528.8	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Trichloroethene	1.26E+02	2190	13797	ND	0.00	ND	0.00	ND	0.00	ND	0.00
1,1,1-Trichloroethane	1.52E+02	900	6840		0.00		0.00		0.00		0.00
1,1,2-Trichloroethane	5.60E+01	900	2520		0.00		0.00		0.00		0.00
Vinyl Chloride	5.70E+01		0		0.00		0.00		0.00		0.00
Other VOCs											
Acetone	2.20E+00	5000	550	ND	0.02	ND	0.02	ND	0.02	ND	0.02
2-Butanone	4.50E+00	5000	1125	ND	0.01	6	0.01	4	0.00	6	0.01
4-Methyl-2-Pentanone	2.09E+01		0		0.00		0.00		0.00		0.00
Carbon Disulfide	5.40E+01		0	ND		ND		ND		ND	
Total-VOCs					*0.03*		*0.03*		*0.03*		*0.03*
SEMIVOLATILE COMPOUNDS											
Noncarcinogenic PAHs											
Acenaphthene	4.60E+03	86	19780	140	0.01	ND	0.02	ND	0.02	ND	0.02

Risks to Soil Invertebrates\Area A Downstream and OBDA
Equilibrium Partitioning Approach

SURFACE SOIL DATA (0-4 FEET)	Koc	Chronic Criterion, ppb	Sediment Quality Criterion, ppb	OBDA 3SD1 Soil Value, ppb	(0-6 in) Toxicity Quotient	3SD1 Soil Value, ppb	(12-18 in) Toxicity Quotient	3SD2 Soil Value, ppb	(0-6 in) Toxicity Quotient	3SD2 Soil Value, ppb	(12-18 in) Toxicity Quotient
Acenaphthylene	2.50E+03	13	1625	ND	0.18	ND	0.18	ND	0.18	ND	0.18
Anthracene	1.40E+04	13	9100	330	0.04	ND	0.03	ND	0.03	ND	0.03
Fluoranthene	3.80E+04	13	24700	1400	0.06	110	0.00	73	0.00	ND	0.01
Fluorene	7.30E+03	13	4745	180	0.04	ND	0.06	ND	0.06	ND	0.06
2-Methylnaphthalene	4.08E+03		0		0.00		0.00		0.00		0.00
Naphthalene	1.22E+58	62	3.796E+58	80	0.00	ND	0.00	ND	0.00	ND	0.00
Phenanthrene	1.40E+04	35	24500	1300	0.05	ND	0.01	ND	0.01	ND	0.01
Pyrene	3.80E+04	13	24700	1400	0.06	140	0.01	170	0.01	ND	0.01
Carcinogenic PAHs											
Benzo(a)Anthracene	1.38E+06	3	207000	850	0.00	ND	0.00	45	0.00	ND	0.00
Benzo(a)Pyrene	5.50E+06	1.2	330000	520	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(b)Fluoranthene	5.50E+05	35	962500	750	0.00	ND	0.00	86	0.00	ND	0.00
Benzo(g,h,i)Perylene	1.60E+06	1.2	96000	260	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(k)Fluoranthene	5.50E+05	35	962500	290	0.00	ND	0.00	ND	0.00	ND	0.00
Chrysene	2.00E+05	13	130000	700	0.01	ND	0.00	75	0.00	ND	0.00
Dibenz(a,h)Anthracene	3.30E+06	1.2	198000		0.00		0.00		0.00		0.00
Indeno(1,2,3-cd)Pyrene	1.60E+06	1.2	96000	360	0.00	ND	0.00	ND	0.00	ND	0.00
Other Semi-Volatile Compounds											
bis(2-Ethylhexyl)Phthalate	6.05E+04	0.3	907.5	ND	0.33	ND	0.33	ND	0.33	ND	0.33
Di-n-Butylphthalate	1.70E+05	105	892500		0.00		0.00		0.00		0.00
2,4-Dimethylphenol	9.60E+01				0.00		0.00		0.00		0.00
4,6-Dinitro-2-methylphenol	2.40E+02				0.00		0.00		0.00		0.00
2-Methylphenol	6.62E+01			120		ND		ND		ND	
4-Methylphenol	6.48E+01				0.00		0.00		0.00		0.00
Phenol	1.42E+01	256	181.76		0.00		0.00		0.00		0.00
Benzoic Acid	5.57E+01	6450	6450	ND	0.23	ND	0.23	ND	0.23	ND	0.23
4-Chloroaniline	5.11E+01				0.00		0.00		0.00		0.00
Dibenzofuran	7.15E+03			100		ND		ND		ND	
2-Nitroaniline	9.80E+01				0.00		0.00		0.00		0.00
N-Nitrosodiphenylamine (1)	8.45E+02				0.00		0.00		0.00		0.00

Risks to Soil Invertebrates\Area A Downstream and OBDA
Equilibrium Partitioning Approach

SURFACE SOIL DATA (0-4 FEET)	Koc	Chronic Criterion, ppb	Sediment Quality Criterion, ppb	OBDA 3SD1 Soil Value, ppb	(0-6 in) Toxicity Quotient	3SD1 Soil Value, ppb	(12-18 in) Toxicity Quotient	3SD2 Soil Value, ppb	(0-6 in) Toxicity Quotient	3SD2 Soil Value, ppb	(12-18 in) Toxicity Quotient
Total Semi-VOCs					*1.01*		*0.89*		*0.88*		*0.90*
PESTICIDES											
4,4' DDE	4.40E+06	0.001	220	87	0.40	60	0.27	ND	0.07	ND	0.07
4,4' DDD	7.70E+05	0.001	38.5	89	2.31	140	3.64	190	4.94	59	1.53
4,4'-DDT	2.43E+05	0.001	12.15	57	4.69	69	5.68	855	70.37	ND	1.20
Beta-BHC	5.12E+03		0		0.00		0.00		0.00		0.00
Endrin	1.70E+03	0.0023	0.1955		0.00		0.00		0.00		0.00
Endrin Ketone			0		0.00		0.00		0.00		0.00
Methoxychlor	8.00E+04	0.03	120		0.00		0.00		0.00		0.00
Total Pesticides					*7.40*		*9.59*		*75.37*		*2.80*
PCBs											
Aroclor 1260	5.30E+05	0.014	371	ND	0.39	ND	0.39	ND	0.39	ND	0.39
Aroclor 1254	5.30E+05	0.014	371		0.00		0.00		0.00		0.00
Total PCBs					*0.39*		*0.39*		*0.39*		*0.39*

Risks to Soil Invertebrates\Area A Downstream and OBDA
Equilibrium Partitioning Approach

SURFACE SOIL DATA (0-4 FEET)	3SD3 Soil Value, ppb	(0-6 in) Toxicity Quotient	3SD3 Soil Value, ppb	(12-18 in) Toxicity Quotient	3SD4 Soil Value, ppb	(0-6 in) Toxicity Quotient	3SD4 Soil Value, ppb	(12-18 in) Toxicity Quotient
VOLATILE ORGANIC COMPOUNDS								
Nonchlorinated Aromatics								
Benzene		0.00		0.00		0.00		0.00
Ethylbenzene	2	0.00	ND	0.00	ND	0.00	ND	0.00
Toluene	ND	0.00	ND	0.00	4	0.00	ND	0.00
Xylene (total)	3	0.00	ND	0.00	ND	0.00	ND	0.00
Chlorinated Compounds								
Chloromethane		0.00		0.00		0.00		0.00
1,1-Dichloroethane		0.00		0.00		0.00		0.00
1,2-Dichloroethane		0.00		0.00		0.00		0.00
1,1-Dichloroethene	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Cis-1,2-dichloroethene		0.00		0.00		0.00		0.00
Trans-1,2-dichloroethene		0.00		0.00		0.00		0.00
Methylene Chloride	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Tetrachloroethane		0.00		0.00		0.00		0.00
Tetrachloroethene	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Trichloroethene	ND	0.00	ND	0.00	ND	0.00	ND	0.00
1,1,1-Trichloroethane		0.00		0.00		0.00		0.00
1,1,2-Trichloroethane		0.00		0.00		0.00		0.00
Vinyl Chloride		0.00		0.00		0.00		0.00
Other VOCs								
Acetone	150	0.27	210	0.38	310	0.56	140	0.25
2-Butanone	32	0.03	51	0.05	66	0.06	33	0.03
4-Methyl-2-Pentanone		0.00		0.00		0.00		0.00
Carbon Disulfide	3		4		ND		ND	
Total-VOCs		*0.31*		*0.43*		*0.63*		*0.29*
SEMIVOLATILE COMPOUNDS								
Noncarcinogenic PAHs								
Acenaphthene	ND	0.02	ND	0.02	ND	0.02	ND	0.02

Risks t Soil Invertebrates\Area A Downstream and OBDA
Equilibrium Partitioning Approach

SURFACE SOIL DATA (0-4 FEET)	3SD3 Soil Value, ppb	(0-6 in) Toxicity Quotient	3SD3 Soil Value, ppb	(12-18 in) Toxicity Quotient	3SD4 Soil Value, ppb	(0-6 in) Toxicity Quotient	3SD4 Soil Value, ppb	(12-18 in) Toxicity Quotient
Acenaphthylene	ND	0.18	ND	0.18	ND	0.18	ND	0.18
Anthracene	ND	0.03	ND	0.03	ND	0.03	ND	0.03
Fluoranthene	ND	0.01	ND	0.01	1300	0.05	970	0.04
Fluorene	ND	0.06	ND	0.06	ND	0.06	ND	0.06
2-Methylnaphthalene		0.00		0.00		0.00		0.00
Naphthalene	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Phenanthrene	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Pyrene	ND	0.01	ND	0.01	1300	0.05	1100	0.04
Carcinogenic PAHs								
Benzo(a)Anthracene	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(a)Pyrene	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(b)Fluoranthene	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(g,h,i)Perylene	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(k)Fluoranthene	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Chrysene	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Dibenz(a,h)Anthracene		0.00		0.00		0.00		0.00
Indeno(1,2,3-cd)Pyrene	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Other Semi-Volatile Compounds								
bis(2-Ethylhexyl)Phthalate	ND	0.33	ND	0.33	ND	0.33	ND	0.33
Di-n-Butylphthalate		0.00		0.00		0.00		0.00
2,4-Dimethylphenol		0.00		0.00		0.00		0.00
4,6-Dinitro-2-methylphenol		0.00		0.00		0.00		0.00
2-Methylphenol	ND		ND		ND		ND	
4-Methylphenol		0.00		0.00		0.00		0.00
Phenol		0.00		0.00		0.00		0.00
Benzoic Acid	ND	0.23	ND	0.23	ND	0.23	ND	0.23
4-Chloroaniline		0.00		0.00		0.00		0.00
Dibenzofuran	ND		ND		ND		ND	
2-Nitroaniline		0.00		0.00		0.00		0.00
N-Nitrosodiphenylamine (1)		0.00		0.00		0.00		0.00

Risks to Soil Invertebrates\Area A Downstream and OBDA
Equilibrium Partitioning Approach

SURFACE SOIL DATA (0-4 FEET)	3SD3 Soil Value, ppb	(0-6 in) Toxicity Quotient	3SD3 Soil Value, ppb	(12-18 in) Toxicity Quotient	3SD4 Soil Value, ppb	(0-6 in) Toxicity Quotient	3SD4 Soil Value, ppb	(12-18 in) Toxicity Quotient
Total Semi-VOCs		*0.90*		*0.90*		*0.98*		*0.96*
PESTICIDES								
4,4' DDE	15000	68.18	2800	12.73	410	1.86	4800	21.82
4,4' DDD	300000	7792.21	73000	1896.10	3200	83.12	84000	2181.82
4,4'-DDT	37000	3045.27	3800	312.76	3300	271.60	12000	987.65
Beta-BHC		0.00		0.00		0.00		0.00
Endrin		0.00		0.00		0.00		0.00
Endrin Ketone		0.00		0.00		0.00		0.00
Methoxychlor		0.00		0.00		0.00		0.00
Total Pesticides		*10905.66*		*2221.59*		*356.59*		*3191.29*
PCBs								
Aroclor 1260	ND	0.39	ND	0.39	ND	0.39	ND	0.39
Aroclor 1254		0.00		0.00		0.00		0.00
Total PCBs		*0.39*		*0.39*		*0.39*		*0.39*

Risks to Soil Invertebrates\Area A Downstream and OBDA
Equilibrium Partitioning Approach

SURFACE SOIL DATA (0-4 FEET)	OBDA 3SD5 (0-6 in) Soil Value, ppb	Toxicity Quotient	3SD5 (12-18 in) Soil Value, ppb	Toxicity Quotient	3MW12S (0-3 feet) Soil Value, ppb	Toxicity Quotient	Downstream 2DMW10S (3-5 feet) Soil Value, ppb	Toxicity Quotient	2DMW11S (2-4 feet) Soil Value, ppb	Toxicity Quotient
VOLATILE ORGANIC COMPOUNDS										
Nonchlorinated Aromatics										
Benzene		0.00		0.00		0.00		0.00		0.00
Ethylbenzene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Toluene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Xylene (total)	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Chlorinated Compounds										
Chloromethane		0.00		0.00		0.00		0.00		0.00
1,1-Dichloroethane		0.00		0.00		0.00		0.00		0.00
1,2-Dichloroethane		0.00		0.00		0.00		0.00		0.00
1,1-Dichloroethene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Cis-1,2-dichloroethene		0.00		0.00		0.00		0.00		0.00
Trans-1,2-dichloroethene		0.00		0.00		0.00		0.00		0.00
Methylene Chloride	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Tetrachloroethane		0.00		0.00		0.00		0.00		0.00
Tetrachloroethene	4	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Trichloroethene	ND	0.00	ND	0.00	ND	0.00	6	0.00	ND	0.00
1,1,1-Trichloroethane		0.00		0.00		0.00		0.00		0.00
1,1,2-Trichloroethane		0.00		0.00		0.00		0.00		0.00
Vinyl Chloride		0.00		0.00		0.00		0.00		0.00
Other VOCs										
Acetone	54	0.10	130	0.24	ND	0.02	ND	0.02	ND	0.02
2-Butanone	13	0.01	24	0.02	32	0.03	ND	0.01	ND	0.01
4-Methyl-2-Pentanone		0.00		0.00		0.00		0.00		0.00
Carbon Disulfide	2		11		ND		ND		ND	
Total-VOCs		*0.12*		*0.27*		*0.05*		*0.03*		*0.03*
SEMIVOLATILE COMPOUNDS										
Noncarcinogenic PAHs										
Acenaphthene	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02

Risks to Soil Invertebrates\Area A Downstream and OBDA
Equilibrium Partitioning Approach

SURFACE SOIL DATA (0-4 FEET)	OBDA 3SD5 (0-6 in) Soil Value, ppb	Toxicity Quotient	3SD5 (12-18 in) Soil Value, ppb	Toxicity Quotient	3MW12S (0-3 feet) Soil Value, ppb	Toxicity Quotient	Downstream 2DMW10S (3-5 feet) Soil Value, ppb	Toxicity Quotient	2DMW11S (2-4 feet) Soil Value, ppb	Toxicity Quotient
Acenaphthylene	ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.18
Anthracene	ND	0.03	390	0.04	ND	0.03	ND	0.03	ND	0.03
Fluoranthene	ND	0.01	1500	0.06	67	0.00	ND	0.01	ND	0.01
Fluorene	ND	0.06	200	0.04	ND	0.06	ND	0.06	ND	0.06
2-Methylnaphthalene		0.00		0.00		0.00		0.00		0.00
Naphthalene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Phenanthrene	ND	0.01	1600	0.07	ND	0.01	ND	0.01	ND	0.01
Pyrene	ND	0.01	1300	0.05	54	0.00	ND	0.01	ND	0.01
Carcinogenic PAHs										
Benzo(a)Anthracene	ND	0.00	720	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(a)Pyrene	ND	0.00	590	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(b)Fluoranthene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(g,h,i)Perylene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(k)Fluoranthene	ND	0.00	ND	0.00	50	0.00	ND	0.00	ND	0.00
Chrysene	ND	0.00	720	0.01	ND	0.00	ND	0.00	ND	0.00
Dibenz(a,h)Anthracene		0.00		0.00		0.00		0.00		0.00
Indeno(1,2,3-cd)Pyrene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Other Semi-Volatile Compounds										
bis(2-Ethylhexyl)Phthalate	ND	0.33	ND	0.33	160	0.18	ND	0.33	140	0.15
Di-n-Butylphthalate		0.00		0.00		0.00		0.00		0.00
2,4-Dimethylphenol		0.00		0.00		0.00		0.00		0.00
4,6-Dinitro-2-methylphenol		0.00		0.00		0.00		0.00		0.00
2-Methylphenol	ND		ND		ND		ND		ND	
4-Methylphenol		0.00		0.00		0.00		0.00		0.00
Phenol		0.00		0.00		0.00		0.00		0.00
Benzoic Acid	ND	0.23	ND	0.23	82	0.01	ND	0.23	ND	0.23
4-Chloroaniline		0.00		0.00		0.00		0.00		0.00
Dibenzofuran	ND		ND		ND		ND		ND	
2-Nitroaniline		0.00		0.00		0.00		0.00		0.00
N-Nitrosodiphenylamine (1)		0.00		0.00		0.00		0.00		0.00

Risks to Soil Invertebrates\Area A Downstream and OBDA
Equilibrium Partitioning Approach

SURFACE SOIL DATA (0-4 FEET)	OBDA 3SD5 (0-6 in) Soil Value, ppb	Toxicity Quotient	3SD5 (12-18 in) Soil Value, ppb	Toxicity Quotient	3MW12S (0-3 feet) Soil Value, ppb	Toxicity Quotient	Downstream 2DMW10S (3-5 feet) Soil Value, ppb	Toxicity Quotient	2DMW11S (2-4 feet) Soil Value, ppb	Toxicity Quotient
Total Semi-VOCs		*0.90*		*1.04*		*0.51*		*0.90*		*0.72*
PESTICIDES										
4,4' DDE	11000	50.00	1500	6.82	27	0.12	ND	0.07	ND	0.07
4,4' DDD	99000	2571.43	11000	285.71	61	1.58	ND	0.38	ND	0.38
4,4'-DDT	1100	90.53	270	22.22	24	1.98	ND	1.20	ND	1.20
Beta-BHC		0.00		0.00		0.00		0.00		0.00
Endrin		0.00		0.00		0.00		0.00		0.00
Endrin Ketone		0.00		0.00		0.00		0.00		0.00
Methoxychlor		0.00		0.00		0.00		0.00		0.00
Total Pesticides		*2711.96*		*314.75*		*3.68*		*1.64*		*1.64*
PCBs										
Aroclor 1260	ND	0.39	ND	0.39	ND	0.39	ND	0.39	ND	0.39
Aroclor 1254		0.00		0.00		0.00		0.00		0.00
Total PCBs		*0.39*		*0.39*		*0.39*		*0.39*		*0.39*

Risks to Soil Invertebrates
Equilibrium Partitioning Approach

SURFACE SOIL DATA (0-4 FEET)	2DMW15S (2-4 feet) Soil Value, ppb	Toxicity Quotient	2DMW16S (2-4 feet) Soil Value, ppb	Toxicity Quotient
VOLATILE ORGANIC COMPOUNDS				
Nonchlorinated Aromatics				
Benzene		0.00		0.00
Ethylbenzene	ND	0.00	ND	0.00
Toluene	100	0.01	ND	0.00
Xylene (total)	ND	0.00	ND	0.00
Chlorinated Compounds				
Chloromethane		0.00		0.00
1,1-Dichloroethane		0.00		0.00
1,2-Dichloroethane		0.00		0.00
1,1-Dichloroethene	16	0.01	ND	0.00
Cis-1,2-dichloroethene		0.00		0.00
Trans-1,2-dichloroethene		0.00		0.00
Methylene Chloride	ND	0.00	ND	0.00
Tetrachloroethane		0.00		0.00
Tetrachloroethene	58	0.04	ND	0.00
Trichloroethene	24	0.00	ND	0.00
1,1,1-Trichloroethane		0.00		0.00
1,1,2-Trichloroethane		0.00		0.00
Vinyl Chloride		0.00		0.00
Other VOCs				
Acetone	79	0.14	ND	0.02
2-Butanone	ND	0.01	ND	0.01
4-Methyl-2-Pentanone		0.00		0.00
Carbon Disulfide	7		ND	
Total-VOCs		*0.21*		*0.03*
SEMIVOLATILE COMPOUNDS				
Noncarcinogenic PAHs				
Acenaphthene	ND	0.02	ND	0.02

Risks to Soil Invertebrates
Equilibrium Partitioning Approach

SURFACE SOIL DATA (0-4 FEET)	2DMW15S (2-4 feet) Soil Value, ppb	Toxicity Quotient	2DMW16S (2-4 feet) Soil Value, ppb	Toxicity Quotient
Acenaphthylene	ND	0.18	ND	0.18
Anthracene	ND	0.03	ND	0.03
Fluoranthene	ND	0.01	ND	0.01
Fluorene	ND	0.06	ND	0.06
2-Methylnaphthalene		0.00		0.00
Naphthalene	ND	0.00	ND	0.00
Phenanthrene	ND	0.01	ND	0.01
Pyrene	ND	0.01	ND	0.01
Carcinogenic PAHs				
Benzo(a)Anthracene	ND	0.00	ND	0.00
Benzo(a)Pyrene	ND	0.00	ND	0.00
Benzo(b)Fluoranthene	ND	0.00	ND	0.00
Benzo(g,h,i)Perylene	ND	0.00	ND	0.00
Benzo(k)Fluoranthene	ND	0.00	ND	0.00
Chrysene	ND	0.00	ND	0.00
Dibenz(a,h)Anthracene		0.00		0.00
Indeno(1,2,3-cd)Pyrene	ND	0.00	ND	0.00
Other Semi-Volatile Compounds				
bis(2-Ethylhexyl)Phthalate	ND	0.33	ND	0.33
Di-n-Butylphthalate		0.00		0.00
2,4-Dimethylphenol		0.00		0.00
4,6-Dinitro-2-methylphenol		0.00		0.00
2-Methylphenol	ND		ND	
4-Methylphenol		0.00		0.00
Phenol		0.00		0.00
Benzoic Acid	ND	0.23	ND	0.23
4-Chloroaniline		0.00		0.00
Dibenzofuran	ND		ND	
2-Nitroaniline		0.00		0.00
N-Nitrosodiphenylamine (1)		0.00		0.00

Risks to Soil Invertebrates
Equilibrium Partitioning Approach

SURFACE SOIL DATA (0-4 FEET)	2DMW15S (2-4 feet) Soil Value, ppb	Toxicity Quotient	2DMW16S (2-4 feet) Soil Value, ppb	Toxicity Quotient
Total Semi-VOCs		*0.90*		*0.90*
PESTICIDES				
4,4' DDE	ND	0.07	28	0.13
4,4' DDD	ND	0.38	ND	0.38
4,4'-DDT	ND	1.20	74	6.09
Beta-BHC		0.00		0.00
Endrin		0.00		0.00
Endrin Ketone		0.00		0.00
Methoxychlor		0.00		0.00
Total Pesticides		*1.64*		*6.60*
PCBs				
Aroclor 1260	ND	0.39	ND	0.39
Aroclor 1254		0.00		0.00
Total PCBs		*0.39*		*0.39*

APPENDIX F-4
RISKS TO SOIL INVERTEBRATES FROM GROUND WATER - AREA A
CALCULATIONS

Risks to Soil Invertebrates due to Ground Water
SHALLOW OVERBURDEN WELLS GROUNDWATER DATA

			AREA A WETLAND 2WMW3S		
	Acute Criterion, ug/l	Chronic Criterion, ug/l	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic
VOLATILE ORGANIC COMPOUNDS					
Nonchlorinated Aromatics					
Benzene	3000	500		0.00	0.00
Ethylbenzene	22500	3750		0.00	0.00
Toluene	3810	635		0.00	0.00
Xylene (total)	4050	675	ND	0.00	0.00
Chlorinated Compounds					
Chloromethane					
1,1-Dichloroethane	3480	580		0.00	0.00
1,2-Dichloroethane	11800	2000		0.00	0.00
1,1-Dichloroethene	3480	580		0.00	0.00
1,2-Dichloroethene (Total)	3480	580		0.00	0.00
Methylene Chloride	68000	11000		0.00	0.00
Tetrachloroethane	9320	2400		0.00	0.00
Tetrachloroethene	528	84		0.00	0.00
Trichloroethene	4500	2190		0.00	0.00
1,1,1-Trichloroethane	5400	900		0.00	0.00
1,1,2-Trichloroethane	5400	900		0.00	0.00
Vinyl Chloride				0.00	0.00
Other VOCs					
Acetone	30000	5000		0.00	0.00
2-Butanone	30000	5000		0.00	0.00
4-Methyl-2-Pentanone				0.00	0.00
Carbon Disulfide				0.00	0.00
Total Index VOCs				*0.00*	*0.00*
SEMIVOLATILE COMPOUNDS					
Noncarcinogenic PAHs					
Acenaphthene	1300	86		0.00	0.00
Acenaphthylene	250	13		0.00	0.00
Anthracene	250	13		0.00	0.00

Risks to Soil Invertebrates due to Ground Water
SHALLOW OVERBURDEN WELLS GROUNDWATER DATA

	Acute Criterion, ug/l	Chronic Criterion, ug/l	AREA A WETLAND 2WMW3S Conc. ug/l	Hazard Index Acute	Hazard Index Chronic
Fluoranthene	250	13		0.00	0.00
Fluorene	250	13		0.00	0.00
2-Methylnaphthalene				0.00	0.00
Naphthalene	230	62		0.00	0.00
Phenanthrene	600	35		0.00	0.00
Pyrene	250	13		0.00	0.00
Carcinogenic PAHs					
Benzo(a)Anthracene	61	3		0.00	0.00
Benzo(a)Pyrene	25	1.2		0.00	0.00
Benzo(b)Fluoranthene	600	35		0.00	0.00
Benzo(g,h,i)Perylene	25	1.2		0.00	0.00
Benzo(k)Fluoranthene	600	35		0.00	0.00
Chrysene	250	13		0.00	0.00
Dibenz(a,h)Anthracene	25	1.2		0.00	0.00
Indeno(1,2,3-cd)Pyrene	25	1.2		0.00	0.00
Other Semi-Volatile Compounds					
bis(2-Ethylhexyl)Phthalate	94	0.3		0.00	0.00
Di-n-Butylphthalate	630	105		0.00	0.00
2,4-Dimethylphenol	212			0.00	0.00
4,6-Dinitro-2-methylphenol				0.00	0.00
2-Methylphenol				0.00	0.00
4-Methylphenol				0.00	0.00
Phenol	1020	256		0.00	0.00
Benzoic Acid	38700	6450		0.00	0.00
4-Chloroaniline				0.00	0.00
Dibenzofuran				0.00	0.00
2-Nitroaniline				0.00	0.00
N-Nitrosodiphenylamine (1)				0.00	0.00
Total Index-SVOCs				*0.00*	*0.00*
PESTICIDES					

Risks to Soil Invertebrates due to Ground Water
SHALLOW OVERBURDEN WELLS GROUNDWATER DATA

			AREA A WETLAND 2WMW3S		
	Acute Criterion, ug/l	Chronic Criterion, ug/l	Conc. ug/l	Hazard Acute	Index Chronic
4,4' DDE	105			0.00	0.00
4,4' DDD				0.00	0.00
4,4'-DDT	1.1	0.001		0.00	0.00
Beta-BHC	100			0.00	0.00
Endrin	0.18	0.0023		0.00	0.00
Endrin Ketone				0.00	0.00
Methoxychlor		0.03		0.00	0.00
Total Index-pesticides				*0.00*	*0.00*
PCBs					
Aroclor 1260	2	0.014		0.00	0.00
Aroclor 1254	2	0.014		0.00	0.00
Total Index-PCBs				*0.00*	*0.00*

Risks to Soil Invertebrates due to Ground Water
SHALLOW OVERBURDEN WELLS GROUNDWATER DATA

			AREA A WETLAND 2WMW3S		
	Acute Criterion, ug/l	Chronic Criterion, ug/l	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic
METALS					
Aluminum	950	150	**39.6**	0.04	0.26
Antimony	900	160		0.00	0.00
Arsenic	85	4.8	**7.6**	0.09	1.58
Beryllium	13	0.53	ND	0.19	4.72
Boron			**970**		
Cadmium	3.9	1.1	**10.6**	2.72	9.64
Copper	18	12	**6.2**	0.34	0.52
Iron		1000	**75400**		75.40
Lead	82	3.2	ND	0.03	0.78
Manganese			**3200**		
Mercury	2.4	0.012		0.00	0.00
Nickel	1400	160	ND	0.01	0.13
Selenium	260	35	**2.3**	0.01	0.07
Zinc	120	110	**15.3**	0.13	0.14
Total Index-metals			*ND*	*3.57*	*93.23*

Risks to Soil Invertebrates due to Ground Water
SHALLOW OVERBURDEN WELLS GROUNDWATER DATA

	2WMW5S			2WMW6S			AREA A DOWNSTREAM 2DMW11S		
	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic
VOLATILE ORGANIC COMPOUNDS									
Nonchlorinated Aromatics									
Benzene		0.00	0.00		0.00	0.00		0.00	0.00
Ethylbenzene		0.00	0.00		0.00	0.00		0.00	0.00
Toluene		0.00	0.00		0.00	0.00		0.00	0.00
Xylene (total)	1	0.00	0.00	ND	0.00	0.00	ND	0.00	0.00
Chlorinated Compounds									
Chloromethane		0.00	0.00		0.00	0.00		0.00	0.00
1,1-Dichloroethane		0.00	0.00		0.00	0.00		0.00	0.00
1,2-Dichloroethane		0.00	0.00		0.00	0.00		0.00	0.00
1,1-Dichloroethene		0.00	0.00		0.00	0.00		0.00	0.00
1,2-Dichloroethene (Total)		0.00	0.00		0.00	0.00		0.00	0.00
Methylene Chloride		0.00	0.00		0.00	0.00		0.00	0.00
Tetrachloroethane		0.00	0.00		0.00	0.00		0.00	0.00
Tetrachloroethene		0.00	0.00		0.00	0.00		0.00	0.00
Trichloroethene		0.00	0.00		0.00	0.00		0.00	0.00
1,1,1-Trichloroethane		0.00	0.00		0.00	0.00		0.00	0.00
1,1,2-Trichloroethane		0.00	0.00		0.00	0.00		0.00	0.00
Vinyl Chloride		0.00	0.00		0.00	0.00		0.00	0.00
Other VOCs									
Acetone		0.00	0.00		0.00	0.00		0.00	0.00
2-Butanone		0.00	0.00		0.00	0.00		0.00	0.00
4-Methyl-2-Pentanone		0.00	0.00		0.00	0.00		0.00	0.00
Carbon Disulfide		0.00	0.00		0.00	0.00		0.00	0.00
Total Index VOCs		*0.00*	*0.00*		*0.00*	*0.00*		*0.00*	*0.00*
SEMIVOLATILE COMPOUNDS									
Noncarcinogenic PAHs									
Acenaphthene		0.00	0.00		0.00	0.00		0.00	0.00
Acenaphthylene		0.00	0.00		0.00	0.00		0.00	0.00
Anthracene		0.00	0.00		0.00	0.00		0.00	0.00

Risks to Soil Invertebrates due to Ground Water

SHALLOW OVERBURDEN WELLS GROUNDWATER DATA	2WMW5S			2WMW6S			AREA A DOWNSTREAM 2DMW11S		
	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic
Fluoranthene		0.00	0.00		0.00	0.00		0.00	0.00
Fluorene		0.00	0.00		0.00	0.00		0.00	0.00
2-Methylnaphthalene		0.00	0.00		0.00	0.00		0.00	0.00
Naphthalene		0.00	0.00		0.00	0.00		0.00	0.00
Phenanthrene		0.00	0.00		0.00	0.00		0.00	0.00
Pyrene		0.00	0.00		0.00	0.00		0.00	0.00
Carcinogenic PAHs									
Benzo(a)Anthracene		0.00	0.00		0.00	0.00		0.00	0.00
Benzo(a)Pyrene		0.00	0.00		0.00	0.00		0.00	0.00
Benzo(b)Fluoranthene		0.00	0.00		0.00	0.00		0.00	0.00
Benzo(g,h,i)Perylene		0.00	0.00		0.00	0.00		0.00	0.00
Benzo(k)Fluoranthene		0.00	0.00		0.00	0.00		0.00	0.00
Chrysene		0.00	0.00		0.00	0.00		0.00	0.00
Dibenz(a,h)Anthracene		0.00	0.00		0.00	0.00		0.00	0.00
Indeno(1,2,3-cd)Pyrene		0.00	0.00		0.00	0.00		0.00	0.00
Other Semi-Volatile Compounds									
bis(2-Ethylhexyl)Phthalate		0.00	0.00		0.00	0.00		0.00	0.00
Di-n-Butylphthalate		0.00	0.00		0.00	0.00		0.00	0.00
2,4-Dimethylphenol		0.00	0.00		0.00	0.00		0.00	0.00
4,6-Dinitro-2-methylphenol		0.00	0.00		0.00	0.00		0.00	0.00
2-Methylphenol		0.00	0.00		0.00	0.00		0.00	0.00
4-Methylphenol		0.00	0.00		0.00	0.00		0.00	0.00
Phenol		0.00	0.00		0.00	0.00		0.00	0.00
Benzoic Acid		0.00	0.00		0.00	0.00		0.00	0.00
4-Chloroaniline		0.00	0.00		0.00	0.00		0.00	0.00
Dibenzofuran		0.00	0.00		0.00	0.00		0.00	0.00
2-Nitroaniline		0.00	0.00		0.00	0.00		0.00	0.00
N-Nitrosodiphenylamine (1)		0.00	0.00		0.00	0.00		0.00	0.00
Total Index-SVOCs		*0.00*	*0.00*		*0.00*	*0.00*		*0.00*	*0.00*
PESTICIDES									

Risks to Soil Invertebrates due to Ground Water
SHALLOW OVERBURDEN WELLS GROUNDWATER DATA

	2WMW5S			2WMW6S			AREA A DOWNSTREAM 2DMW11S		
	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic
4,4' DDE		0.00	0.00		0.00	0.00		0.00	0.00
4,4' DDD		0.00	0.00		0.00	0.00		0.00	0.00
4,4'-DDT		0.00	0.00		0.00	0.00		0.00	0.00
Beta-BHC		0.00	0.00		0.00	0.00		0.00	0.00
Endrin		0.00	0.00		0.00	0.00		0.00	0.00
Endrin Ketone		0.00	0.00		0.00	0.00		0.00	0.00
Methoxychlor		0.00	0.00		0.00	0.00		0.00	0.00
Total Index-pesticides		*0.00*	*0.00*		*0.00*	*0.00*		*0.00*	*0.00*
PCBs									
Aroclor 1260		0.00	0.00		0.00	0.00		0.00	0.00
Aroclor 1254		0.00	0.00		0.00	0.00		0.00	0.00
Total Index-PCBs		*0.00*	*0.00*		*0.00*	*0.00*		*0.00*	*0.00*

Risks to Soil Invertebrates due to Ground Water
SHALLOW OVERBURDEN WELLS GROUNDWATER DATA

	2WMW5S			2WMW6S			AREA A DOWNSTREAM 2DMW11S		
	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic
METALS									
Aluminum	ND	0.01	0.07	**2060**	2.17	13.73	ND	0.01	0.07
Antimony		0.00	0.00		0.00	0.00		0.00	0.00
Arsenic	ND	0.06	1.04	ND	0.06	1.04	ND	0.06	1.04
Beryllium	ND	0.19	4.72	**1**	0.08	1.89	ND	0.19	4.72
Boron	**1600**			**7500**			**7500**		
Cadmium	**6.4**	1.64	5.82	ND	0.64	2.27	ND	0.64	2.27
Copper	**7.9**	0.44	0.66	ND	0.69	1.04	**5**	0.28	0.42
Iron	**44800**		44.80	**3140**		3.14	**101**		0.10
Lead	ND	0.03	0.78	**2.5**	0.03	0.78	ND	0.03	0.78
Manganese	**8130**			**648**			**1150**		
Mercury		0.00	0.00		0.00	0.00		0.00	0.00
Nickel	ND	0.01	0.13	**39.7**	0.03	0.25	**15.2**	0.01	0.10
Selenium	**2.2**	0.01	0.06	ND	0.01	0.07	ND	0.01	0.07
Zinc	**12.4**	0.10	0.11	**136**	1.13	1.24	**6.7**	0.06	0.06
Total Index-metals		*2.50*	*58.18*		*4.84*	*25.45*		*1.29*	*9.62*

Risks to Soil Invertebrates due to Ground Water
SHALLOW OVERBURDEN WELLS GROUNDWATER DATA

	OBDA					
	2DMW16S			3MW12S		
	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic
VOLATILE ORGANIC COMPOUNDS						
Nonchlorinated Aromatics						
Benzene		0.00	0.00		0.00	0.00
Ethylbenzene		0.00	0.00		0.00	0.00
Toluene		0.00	0.00		0.00	0.00
Xylene (total)	ND	0.00	0.00	ND	0.00	0.00
Chlorinated Compounds						
Chloromethane		0.00	0.00		0.00	0.00
1,1-Dichloroethane		0.00	0.00		0.00	0.00
1,2-Dichloroethane		0.00	0.00		0.00	0.00
1,1-Dichloroethene		0.00	0.00		0.00	0.00
1,2-Dichloroethene (Total)		0.00	0.00		0.00	0.00
Methylene Chloride		0.00	0.00		0.00	0.00
Tetrachloroethane		0.00	0.00		0.00	0.00
Tetrachloroethene		0.00	0.00		0.00	0.00
Trichloroethene		0.00	0.00		0.00	0.00
1,1,1-Trichloroethane		0.00	0.00		0.00	0.00
1,1,2-Trichloroethane		0.00	0.00		0.00	0.00
Vinyl Chloride		0.00	0.00		0.00	0.00
Other VOCs						
Acetone		0.00	0.00		0.00	0.00
2-Butanone		0.00	0.00		0.00	0.00
4-Methyl-2-Pentanone		0.00	0.00		0.00	0.00
Carbon Disulfide		0.00	0.00		0.00	0.00
Total Index VOCs		*0.00*	*0.00*		*0.00*	*0.00*
SEMIVOLATILE COMPOUNDS						
Noncarcinogenic PAHs						
Acenaphthene		0.00	0.00		0.00	0.00
Acenaphthylene		0.00	0.00		0.00	0.00
Anthracene		0.00	0.00		0.00	0.00

Risks to Soil Invertebrates due to Ground Water

OBDA

SHALLOW OVERBURDEN WELLS GROUNDWATER DATA	**2DMW16S**			**3MW12S**		
	Conc. ug/l	**Hazard Index Acute**	**Chronic**	**Conc. ug/l**	**Hazard Index Acute**	**Chronic**
Fluoranthene		0.00	0.00		0.00	0.00
Fluorene		0.00	0.00		0.00	0.00
2-Methylnaphthalene		0.00	0.00		0.00	0.00
Naphthalene		0.00	0.00		0.00	0.00
Phenanthrene		0.00	0.00		0.00	0.00
Pyrene		0.00	0.00		0.00	0.00
Carcinogenic PAHs						
Benzo(a)Anthracene		0.00	0.00		0.00	0.00
Benzo(a)Pyrene		0.00	0.00		0.00	0.00
Benzo(b)Fluoranthene		0.00	0.00		0.00	0.00
Benzo(g,h,i)Perylene		0.00	0.00		0.00	0.00
Benzo(k)Fluoranthene		0.00	0.00		0.00	0.00
Chrysene		0.00	0.00		0.00	0.00
Dibenz(a,h)Anthracene		0.00	0.00		0.00	0.00
Indeno(1,2,3-cd)Pyrene		0.00	0.00		0.00	0.00
Other Semi-Volatile Compounds						
bis(2-Ethylhexyl)Phthalate		0.00	0.00		0.00	0.00
Di-n-Butylphthalate		0.00	0.00		0.00	0.00
2,4-Dimethylphenol		0.00	0.00		0.00	0.00
4,6-Dinitro-2-methylphenol		0.00	0.00		0.00	0.00
2-Methylphenol		0.00	0.00		0.00	0.00
4-Methylphenol		0.00	0.00		0.00	0.00
Phenol		0.00	0.00		0.00	0.00
Benzoic Acid		0.00	0.00		0.00	0.00
4-Chloroaniline		0.00	0.00		0.00	0.00
Dibenzofuran		0.00	0.00		0.00	0.00
2-Nitroaniline		0.00	0.00		0.00	0.00
N-Nitrosodiphenylamine (1)		0.00	0.00		0.00	0.00
Total Index-SVOCs		*0.00*	*0.00*		*0.00*	*0.00*
PESTICIDES						

Risks to Soil Invertebrates due to Ground Water
SHALLOW OVERBURDEN WELLS GROUNDWATER DATA

	OBDA					
	2DMW16S			3MW12S		
	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic
4,4' DDE		0.00	0.00		0.00	0.00
4,4' DDD		0.00	0.00		0.00	0.00
4,4'-DDT		0.00	0.00		0.00	0.00
Beta-BHC		0.00	0.00		0.00	0.00
Endrin		0.00	0.00		0.00	0.00
Endrin Ketone		0.00	0.00		0.00	0.00
Methoxychlor		0.00	0.00		0.00	0.00
Total Index-pesticides		*0.00*	*0.00*		*0.00*	*0.00*
PCBs						
Aroclor 1260		0.00	0.00		0.00	0.00
Aroclor 1254		0.00	0.00		0.00	0.00
Total Index-PCBs		*0.00*	*0.00*		*0.00*	*0.00*

Risks to Soil Invertebrates due to Ground Water
SHALLOW OVERBURDEN WELLS GROUNDWATER DATA

	OBDA					
	2DMW16S			3MW12S		
	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic	Conc. ug/l	Hazard Index Acute	Hazard Index Chronic
METALS						
Aluminum	ND	0.01	0.07	ND	0.01	0.07
Antimony		0.00	0.00		0.00	0.00
Arsenic	ND	0.06	1.04	ND	0.06	1.04
Beryllium	ND	0.19	4.72	ND	0.19	4.72
Boron	**2200**			**11000**		
Cadmium	ND	0.64	2.27	ND	0.64	2.27
Copper	ND	0.69	1.04	ND	0.69	1.04
Iron	**669**		0.67	**1580**		1.58
Lead	ND	0.03	0.78	ND	0.03	0.78
Manganese	**339**			**6010**		
Mercury		0.00	0.00		0.00	0.00
Nickel	**20.5**	0.01	0.13	**19.7**	0.01	0.12
Selenium	ND	0.01	0.07	ND	0.01	0.07
Zinc	**22.8**	0.19	0.21	**14.4**	0.12	0.13
Total Index-metals		*1.84*	*11.00*		*1.77*	*11.83*

APPENDIX F-5
RISKS TO BENTHIC INVERTEBRATES - AREA A
EQUILIBRIUM PARTITIONING CALCULATIONS

Risks to Benthic Invertebrates/Equilibrium Partitioning Method

SEDIMENT DATA
AREA A DOWNSTREAM

SAMPLE ID: DEPTH (in):	Koc	Chronic Criterion (ppb)	Sediment Quality Criterion (ppb)	Pond Sed. Value, ppb	2DSD1 Toxicity Quotient	Pond Sed. Value, ppb	2DSD2 Toxicity Quotient	Pond Sed. Value, ppb	2DSD4 Toxicity Quotient	Stream Sed. Value, ppb	2DSD3 Toxicity Quotient
VOLATILE ORGANIC C	**MPOUNDS**										
Nonchlorinated Aromatics											
Benzene	8.30E+01	500	2075		0.00		0.00		0.00		0.00
Ethylbenzene	1.10E+03	3750	206250		0.00		0.00		0.00		0.00
Toluene	3.00E+02	635	9525		0.00		0.00		0.00		0.00
Xylene (total)	2.40E+02	675	8100		0.00		0.00		0.00		0.00
Chlorinated Compounds											
Chloromethane	2.70E+01		0		0.00		0.00		0.00		0.00
1,1-Dichloroethane	3.00E+01	580	870		0.00		0.00		0.00		0.00
1,2-Dichloroethane	1.40E+01	2000	1400		0.00		0.00		0.00		0.00
1,1-Dichloroethene	6.50E+01	580	1885		0.00		0.00		0.00		0.00
Cis-1,2-dichloroethene	4.90E+01	580	1421		0.00		0.00		0.00		0.00
Trans-1,2-dichloroethene	5.90E+01	580	1711		0.00		0.00		0.00		0.00
Methylene Chloride	8.80E+00	11000	4840	ND	0.00	5	0.00	ND	0.00	3	0.00
Tetrachloroethane	1.18E+02	2400	14160		0.00		0.00		0.00		0.00
Tetrachloroethene	3.64E+02	84	1528.8		0.00		0.00		0.00		0.00
Trichloroethene	1.26E+02	2190	13797	ND	0.00	3	0.00	ND	0.00	ND	0.00
1,1,1-Trichloroethane	1.52E+02	900	6840		0.00		0.00		0.00		0.00
1,1,2-Trichloroethane	5.60E+01	900	2520		0.00		0.00		0.00		0.00
Vinyl Chloride	5.70E+01		0		0.00		0.00		0.00		0.00
Other VOCs											
Acetone	2.20E+00	5000	550		0.00		0.00		0.00		0.00
2-Butanone	4.50E+00	5000	1125		0.00		0.00		0.00		0.00
4-Methyl-2-Pentanone	2.09E+01				0.00		0.00		0.00		0.00
Carbon Disulfide	5.40E+01			ND		4		ND		ND	
Total-VOCs					**0.00**		**0.00**		**0.00**		**0.00**
SEMIVOLATILE COMP	**UNDS**										
Noncarcinogenic PAHs											
Acenaphthene	4.60E+03	86	19780	ND	0.02	ND	0.02	ND	0.02	ND	0.02

Risks to Benthic Invertebrates/Equilibrium Partitioning Method

SEDIMENT DATA
AREA A DOWNSTREAM

SAMPLE ID: DEPTH (in):	Koc	Chronic Criterion (ppb)	Sediment Quality Criterion (ppb)	Pond Sed. Value, ppb	2DSD1 Toxicity Quotient	Pond Sed. Value, ppb	2DSD2 Toxicity Quotient	Pond Sed. Value, ppb	2DSD4 Toxicity Quotient	Stream Sed. Value, ppb	2DSD3 Toxicity Quotient
Acenaphthylene	2.50E+03	13	1625	ND	0.18	ND	0.18	ND	0.18	ND	0.18
Anthracene	1.40E+04	13	9100	ND	0.03	ND	0.03	ND	0.03	ND	0.03
Fluoranthene	3.80E+04	13	24700	ND	0.01	ND	0.01	97	0.00	ND	0.01
Fluorene	7.30E+03	13	4745	ND	0.06	ND	0.06	ND	0.06	ND	0.06
2-Methylnaphthalene	4.08E+03		0		0.00		0.00		0.00		0.00
Naphthalene	1.22E+58	62	3.796E+58		0.00		0.00		0.00		0.00
Phenanthrene	1.40E+04	35	24500	ND	0.01	ND	0.01	130	0.01	ND	0.01
Pyrene	3.80E+04	13	24700	ND	0.01	ND	0.01	190	0.01	ND	0.01
Carcinogenic PAHs											
Benzo(a)Anthracene	1.38E+06	3	207000	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(a)Pyrene	5.50E+06	1.2	330000	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(b)Fluoranthene	5.50E+05	35	962500	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(g,h,i)Perylene	1.60E+06	1.2	96000	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Benzo(k)Fluoranthene	5.50E+05	35	962500	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Chrysene	2.00E+05	13	130000	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Dibenz(a,h)Anthracene	3.30E+06	1.2	198000		0.00		0.00		0.00		0.00
Indeno(1,2,3-cd)Pyrene	1.60E+06	1.2	96000	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Other Semi-Volatile Comp unds											
bis(2-Ethylhexyl)Phthalate	6.05E+04	0.3	907.5		0.00		0.00		0.00		0.00
Di-n-Butylphthalate	1.70E+05	105	892500		0.00		0.00		0.00		0.00
2,4-Dimethylphenol	9.60E+01		0		0.00		0.00		0.00		0.00
4,6-Dinitro-2-methylphenol	2.40E+02			ND		6200		ND		ND	
2-Methylphenol	6.62E+01				0.00		0.00		0.00		0.00
4-Methylphenol	6.48E+01				0.00		0.00		0.00		0.00
Phenol	1.42E+01	256	181.76		0.00		0.00		0.00		0.00
Benzoic Acid	5.57E+01	6450	17963.25	ND	0.08	ND	0.08	160	0.08	ND	0.08
4-Chloroaniline	5.11E+01			ND		ND		ND		ND	
Dibenzofuran	7.15E+03				0.00		0.00		0.00		0.00
2-Nitroaniline	9.80E+01			ND		3100		ND		ND	
N-Nitrosodiphenylamine (1)	8.45E+02				0.00		0.00		0.00		0.00

Risks to Benthic Invertebrates/Equilibrium Partitioning Method

SEDIMENT DATA
AREA A DOWNSTREAM

SAMPLE ID: DEPTH (in):	Koc	Chronic Criterion (ppb)	Sediment Quality Criterion (ppb)	Pond Sed. Value, ppb	2DSD1 Toxicity Quotient	Pond Sed. Value, ppb	2DSD2 Toxicity Quotient	Pond Sed. Value, ppb	2DSD4 Toxicity Quotient	Stream Sed. Value, ppb	2DSD3 Toxicity Quotient
Total Semi-VOCs					**0.43**		**0.43**		**0.41**		**0.43**
PESTICIDES											
4,4' DDE	4.40E+06	0.001	220	6300	28.64	3100	14.09	28000	127.27	1500	6.82
4,4' DDD	7.70E+05	0.001	38.5	23000	597.40	90000	2337.66	1700000	44155.84	18000	467.53
4,4'-DDT	2.43E+05	0.001	12.15	ND	1.20	1400	115.23	240000	19753.09	60	4.94
Beta-BHC	5.12E+03				0.00		0.00		0.00		0.00
Endrin	1.70E+03	0.0023	0.1955		0.00		0.00		0.00		0.00
Endrin Ketone					0.00		0.00		0.00		0.00
Methoxychlor	8.00E+04	0.03	120		0.00		0.00		0.00		0.00
Total Pesticides					**627.24**		**2466.98**		**64036.20**		**479.29**
PCBs											
Aroclor 1260	5.30E+05	0.014	371	ND	0.39	ND	0.39	ND	0.39	ND	0.39
Aroclor 1254	5.30E+05	0.014	371		0.00		0.00		0.00		0.00
Total PCBs					**0.39**		**0.39**		**0.39**		**0.39**

Risks to Benthic Invertebrates/Equilibrium Partitioning Method

SEDIMENT DATA AREA A DOWNSTREAM SAMPLE ID: DEPTH (in):	Stream Sed. Value, ppb	2DSD5 Toxicity Quotient	Stream Sed. Value, ppb	2DSD7 Toxicity Quotient	Stream Sed. Value, ppb	2DSD8 Toxicity Quotient	Stream Sed. Value, ppb	2DSD9 Toxicity Quotient	Stream Sed. Value, ppb	2DSD11 Toxicity Quotient	Stream Sed. Value, ppb	7SD1 Toxicity Quotient
VOLATILE ORGANIC C												
Nonchlorinated Aromatics												
Benzene		0.00		0.00		0.00		0.00		0.00		0.00
Ethylbenzene		0.00		0.00		0.00		0.00		0.00		0.00
Toluene		0.00		0.00		0.00		0.00		0.00		0.00
Xylene (total)		0.00		0.00		0.00		0.00		0.00		0.00
Chl rinated Compounds												
Chloromethane		0.00		0.00		0.00		0.00		0.00		0.00
1,1-Dichloroethane		0.00		0.00		0.00		0.00		0.00		0.00
1,2-Dichloroethane		0.00		0.00		0.00		0.00		0.00		0.00
1,1-Dichloroethene		0.00		0.00		0.00		0.00		0.00		0.00
Cis-1,2-dichloroethene		0.00		0.00		0.00		0.00		0.00		0.00
Trans-1,2-dichloroethene		0.00		0.00		0.00		0.00		0.00		0.00
Methylene Chloride	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
Tetrachloroethane		0.00		0.00		0.00		0.00		0.00		0.00
Tetrachloroethene		0.00		0.00		0.00		0.00	ND	0.00	ND	0.00
Trichloroethene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00	ND	0.00
1,1,1-Trichloroethane		0.00		0.00		0.00		0.00		0.00		0.00
1,1,2-Trichloroethane		0.00		0.00		0.00		0.00		0.00		0.00
Vinyl Chloride		0.00		0.00		0.00		0.00		0.00		0.00
Other VOCs												
Acetone		0.00		0.00		0.00		0.00		0.00		0.00
2-Butanone		0.00		0.00		0.00		0.00		0.00		0.00
4-Methyl-2-Pentanone		0.00		0.00		0.00		0.00		0.00		0.00
Carbon Disulfide	5		2		ND		ND		ND		ND	
Total-VOCs		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**
SEMIVOLATILE COMP												
Noncarcinogenic PAHs												
Acenaphthene	ND	0.02	ND	0.02	ND	0.02	ND	0.02	41	0.00	ND	0.02

Risks to Benthic Invertebrates/Equilibrium Partitioning Method

SEDIMENT DATA AREA A DOWNSTREAM SAMPLE ID: DEPTH (in):	Stream Sed. Value, ppb	2DSD5 Toxicity Quotient	Stream Sed. Value, ppb	2DSD7 Toxicity Quotient	Stream Sed. Value, ppb	2DSD8 Toxicity Quotient	Stream Sed. Value, ppb	2DSD9 Toxicity Quotient	Stream Sed. Value, ppb	2DSD11 Toxicity Quotient	Stream Sed. Value, ppb	7SD1 Toxicity Quotient
Acenaphthylene	ND	0.18	ND	0.18	ND	0.18	ND	0.18	150	0.09	ND	0.18
Anthracene	ND	0.03	ND	0.03	ND	0.03	ND	0.03	160	0.02	ND	0.03
Fluoranthene	280	0.01	1000	0.04	ND	0.01	340	0.01	1300	0.05	210	0.01
Fluorene	ND	0.06	ND	0.06	ND	0.06	ND	0.06	130	0.03	ND	0.06
2-Methylnaphthalene		0.00		0.00		0.00		0.00		0.00		0.00
Naphthalene		0.00		0.00		0.00		0.00		0.00		0.00
Phenanthrene	210	0.01	980	0.04	ND	0.01	160	0.01	1600	0.07	140	0.01
Pyrene	380	0.02	810	0.03	1200	0.05	560	0.02	4700	0.19	200	0.01
Carcinogenic PAHs												
Benzo(a)Anthracene	130	0.00	ND	0.00	ND	0.00	230	0.00	780	0.00	84	0.00
Benzo(a)Pyrene	ND	0.00	ND	0.00	ND	0.00	180	0.00	640	0.00	ND	0.00
Benzo(b)Fluoranthene	140	0.00	ND	0.00	ND	0.00	340	0.00	520	0.00	ND	0.00
Benzo(g,h,i)Perylene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	1200	0.01	ND	0.00
Benzo(k)Fluoranthene	110	0.00	ND	0.00	ND	0.00	110	0.00	300	0.00	ND	0.00
Chrysene	170	0.00	ND	0.00	1200	0.01	220	0.00	950	0.01	110	0.00
Dibenz(a,h)Anthracene		0.00		0.00		0.00		0.00		0.00		0.00
Indeno(1,2,3-cd)Pyrene	ND	0.00	ND	0.00	ND	0.00	ND	0.00	1200	0.01	ND	0.00
Other Semi-Volatile Comp												
bis(2-Ethylhexyl)Phthalate		0.00		0.00		0.00		0.00		0.00		0.00
Di-n-Butylphthalate		0.00		0.00		0.00		0.00		0.00		0.00
2,4-Dimethylphenol		0.00		0.00		0.00		0.00		0.00		0.00
4,6-Dinitro-2-methylphenol	ND		ND		ND		ND		ND		ND	
2-Methylphenol		0.00		0.00		0.00		0.00		0.00		0.00
4-Methylphenol		0.00		0.00		0.00		0.00		0.00		0.00
Phenol		0.00		0.00		0.00		0.00		0.00		0.00
Benzoic Acid	ND	0.08	ND	0.08	ND	0.08	ND	0.08	46	0.00	ND	0.08
4-Chloroaniline	ND		510		ND		ND		ND		ND	
Dibenzofuran		0.00		0.00		0.00		0.00		0.00		0.00
2-Nitroaniline	ND		ND		ND		ND		ND		ND	
N-Nitrosodiphenylamine (1)		0.00		0.00		0.00		0.00		0.00		0.00

Risks to Benthic Invertebrates/Equilibrium Partitioning Method

SEDIMENT DATA AREA A DOWNSTREAM SAMPLE ID: DEPTH (in):	Stream Sed. Value, ppb	2DSD5 Toxicity Quotient	Stream Sed. Value, ppb	2DSD7 Toxicity Quotient	Stream Sed. Value, ppb	2DSD8 Toxicity Quotient	Stream Sed. Value, ppb	2DSD9 Toxicity Quotient	Stream Sed. Value, ppb	2DSD11 Toxicity Quotient	Stream Sed. Value, ppb	7SD1 Toxicity Quotient
Total Semi-VOCs		**0.42**		**0.50**		**0.47**		**0.43**		**0.49**		**0.41**
PESTICIDES												
4,4' DDE	17	0.08	170	0.77	350	1.59	ND	0.07	120	0.55	ND	0.07
4,4' DDD	1000	25.97	3300	85.71	14000	363.64	12000	311.69	ND	0.38	ND	0.38
4,4'-DDT	29	2.39	1400	115.23	610	50.21	7000	576.13	ND	1.20	ND	1.20
Beta-BHC		0.00		0.00		0.00		0.00		0.00		0.00
Endrin		0.00		0.00		0.00		0.00		0.00		0.00
Endrin Ketone		0.00		0.00		0.00		0.00		0.00		0.00
Methoxychlor		0.00		0.00		0.00		0.00		0.00		0.00
Total Pesticides		**28.44**		**201.71**		**415.43**		**887.89**		**2.12**		**1.64**
PCBs												
Aroclor 1260	ND	0.39	ND	0.39	ND	0.39	ND	0.39	ND	0.39	ND	0.39
Aroclor 1254		0.00		0.00		0.00		0.00		0.00		0.00
Total PCBs		**0.39**		**0.39**		**0.39**		**0.39**		**0.39**		**0.39**

Risks to Benthic Invertebrates
Equilibrium Partitioning Method

SEDIMENT DATA AREA A DOWNSTREAM SAMPLE ID: DEPTH (in):	N.Lake Sed. Value, ppb	2DSD10 Toxicity Quotient	Thames Sed. Value, ppb	2DSD12 Toxicity Quotient	Thames Sed. Value, ppb	2DSD13 Toxicity Quotient
VOLATILE ORGANIC C						
Nonchlorinated Aromatics						
Benzene		0.00		0.00		0.00
Ethylbenzene		0.00		0.00		0.00
Toluene		0.00		0.00		0.00
Xylene (total)		0.00		0.00		0.00
Chlorinated Compounds						
Chloromethane		0.00		0.00		0.00
1,1-Dichloroethane		0.00		0.00		0.00
1,2-Dichloroethane		0.00		0.00		0.00
1,1-Dichloroethene		0.00		0.00		0.00
Cis-1,2-dichloroethene		0.00		0.00		0.00
Trans-1,2-dichloroethene		0.00		0.00		0.00
Methylene Chloride	ND	0.00	ND	0.00	ND	0.00
Tetrachloroethane		0.00		0.00		0.00
Tetrachloroethene	ND	0.00	ND	0.00	ND	0.00
Trichloroethene	ND	0.00	ND	0.00	ND	0.00
1,1,1-Trichloroethane		0.00		0.00		0.00
1,1,2-Trichloroethane		0.00		0.00		0.00
Vinyl Chloride		0.00		0.00		0.00
Other VOCs						
Acetone		0.00		0.00		0.00
2-Butanone		0.00		0.00		0.00
4-Methyl-2-Pentanone		0.00		0.00		0.00
Carbon Disulfide	ND		ND		ND	
Total-VOCs		**0.00**		**0.00**		**0.00**
SEMIVOLATILE COMP						
Noncarcinogenic PAHs						
Acenaphthene	ND	0.02	ND	0.02	ND	0.02

Risks to Benthic Invertebrates
Equilibrium Partitioning Method

SEDIMENT DATA AREA A DOWNSTREAM SAMPLE ID: DEPTH (in):	N.Lake Sed. Value, ppb	2DSD10 Toxicity Quotient	Thames Sed. Value, ppb	2DSD12 Toxicity Quotient	Thames Sed. Value, ppb	2DSD13 Toxicity Quotient
Acenaphthylene	ND	0.18	71	0.04	65	0.04
Anthracene	ND	0.03	68	0.01	91	0.01
Fluoranthene	68	0.00	590	0.02	750	0.03
Fluorene	ND	0.06	ND	0.06	51	0.01
2-Methylnaphthalene		0.00		0.00		0.00
Naphthalene		0.00		0.00		0.00
Phenanthrene	ND	0.01	270	0.01	500	0.02
Pyrene	64	0.00	2700	0.11	640	0.03
Carcinogenic PAHs						
Benzo(a)Anthracene	ND	0.00	700	0.00	430	0.00
Benzo(a)Pyrene	ND	0.00	410	0.00	310	0.00
Benzo(b)Fluoranthene	47	0.00	500	0.00	320	0.00
Benzo(g,h,i)Perylene	ND	0.00	730	0.01	ND	0.00
Benzo(k)Fluoranthene	ND	0.00	170	0.00	320	0.00
Chrysene	ND	0.00	540	0.00	420	0.00
Dibenz(a,h)Anthracene		0.00		0.00		0.00
Indeno(1,2,3-cd)Pyrene	ND	0.00	750	0.01	110	0.00
Other Semi-Volatile Comp						
bis(2-Ethylhexyl)Phthalate		0.00		0.00		0.00
Di-n-Butylphthalate		0.00		0.00		0.00
2,4-Dimethylphenol		0.00		0.00		0.00
4,6-Dinitro-2-methylphenol	ND		ND		ND	
2-Methylphenol		0.00		0.00		0.00
4-Methylphenol		0.00		0.00		0.00
Phenol		0.00		0.00		0.00
Benzoic Acid	ND	0.08	91	0.01	ND	0.08
4-Chloroaniline	ND		ND		ND	
Dibenzofuran		0.00		0.00		0.00
2-Nitroaniline	ND		ND		ND	
N-Nitrosodiphenylamine (1)		0.00		0.00		0.00

Risks to Benthic Invertebrates
Equilibrium Partitioning Method

SEDIMENT DATA AREA A DOWNSTREAM SAMPLE ID: DEPTH (in):	N.Lake Sed. Value, ppb	2DSD10 Toxicity Quotient	Thames Sed. Value, ppb	2DSD12 Toxicity Quotient	Thames Sed. Value, ppb	2DSD13 Toxicity Quotient
Total Semi-VOCs		**0.41**		**0.30**		**0.24**
PESTICIDES						
4,4' DDE	ND	0.07	ND	0.07	ND	0.07
4,4' DDD	ND	0.38	ND	0.38	ND	0.38
4,4'-DDT	ND	1.20	68	5.60	120	9.88
Beta-BHC		0.00		0.00		0.00
Endrin		0.00		0.00		0.00
Endrin Ketone		0.00		0.00		0.00
Methoxychlor		0.00		0.00		0.00
Total Pesticides		**1.64**		**6.04**		**10.32**
PCBs						
Aroclor 1260	ND	0.39	280	0.75	ND	0.39
Aroclor 1254		0.00		0.00		0.00
Total PCBs		**0.39**		**0.75**		**0.39**